AVIATION IN THE XXI-ST CENTURY

INTERNATIONAL CIVIL AVIATION ORGANIZATION
NATIONAL ACADEMY OF SCIENCES OF UKRAINE
MINISTRY OF EDUCATION AND SCIENCE,
YOUTH AND SPORT OF UKRAINE
NATIONAL AVIATION UNIVERSITY

PROCEEDINGS

THE FIFTH WORLD CONGRESS "AVIATION IN THE XXI-st CENTURY"

"Safety in Aviation and Space Technologies"

Volume 3

September 25-27, 2012
Kyiv, Ukraine

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* *Authors are responsible for the content of the report*

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S. Puzik, PhD in Technical Sciences,
V. Zakrevskyi, PhD in Technical Sciences,
V. Shevchuk, PhD in Technical Sciences,
A. Hvozdetskyi, post-graduated student,
(National Aviation University, Ukraine)

THE CLEANING EFFICIENCY OF AVIATION FUEL IN THE TANK CONTINUOUS TYPE OF DIFFUSER

The efficacy of air purification in fuel tank of a continuous diffuser type: with increasing pumping rate, dielectric constant and viscosity coefficient of fuel clearance is reduced.

It is easy to provide the purification of aviation fuel from impurities by use of gravity force. Instruments, the action of which is based on use of terrestrial gravitational field, are called sediment bowls.

There are batch operation (the fuel is out of motion during some periods of time) and continuous operation (the sedimentation takes place in the fuel which is in motion) sediment bowls.

Each contamination particle in the fuel is effected by gravity force and opposite buoyancy force. If density of the particle is higher then fuel density, the particle settles onto the bottom of the sediment bowl, and on the contrary, the particle floats. Viscous force counteract to the motion of the particle in the fuel.

The scheme of gravity-type sediment bowl is shown on fig. 1.

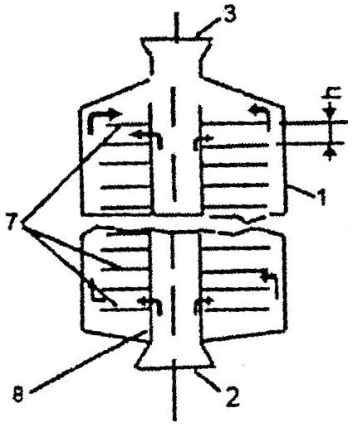

Fig.1. The tank of diffuse type sediment bowl with batch operation

The mass of contamination particles M is calculated as the product of specific weight q and volume, which contains these particles, i.e.:

$$M = q\mathrm{y}h,$$

where h — the height of flow passage, σ — cross-sectional area; [M] = kg, [h] =m, [y] = m^2, [q] = kg/m^3.

The change of contamination mass (the rate of purification) is $m_t = \dfrac{dM}{dt}$.

From the other hand, the rate of purification can be defined by ratio: $m_t = -qV_*\mathrm{y},$ where V_* — the maximal sedimentation rate.

Taking into account that $\dfrac{dM}{dt} = \dfrac{dM}{dq}\dfrac{dq}{dt} = \mathrm{y}h\dfrac{dq}{dt},$ it is possible to write the differential equation of specific mass change of contamination particles:

$$\frac{dq}{dt} = -q\frac{V_*}{h}. \tag{1}$$

This differential equation should be supplemented by initial conditions:

$$\text{if } t = t_0 = 0, \text{ then } q(0) = q_0,$$

where q_0 — specific mass of contamination particles before purification.

If solving the equation (1), it is the result:

$$\frac{dq}{q} = -\frac{V_*}{h}dt \Rightarrow \int\frac{dq}{q} = -\frac{V_*}{h}\int dt \Rightarrow \ln q = -\frac{V_*}{h}t + C_0.$$

Taking into account the initial data, the constant of integration is $C_0 = \ln q_0$, and the solution of differential equation (1) is of the form:

$$q = q_0 e^{-\frac{V_*}{h}t}, \text{ or } q = q_0\exp(-\frac{V_*}{h}t). \tag{2}$$

The efficiency index of sediment bowl operation is filtration factor з (or efficiency factor of the installation):

$$з = \frac{q_0 - q_1}{q_0}, \tag{3}$$

where q_0 and q_1 are the specific mass of contamination particles before and after purification. In consideration of ratio (2), it is taken that:

$$з = 1 - e^{\frac{V_*}{h}t_1} \text{ or } \eta = 1 - \exp(-\frac{V_*}{h}t_1). \tag{4}$$

In order to calculate V_* and t it is necessary to determine the speed and relative motion equation for contamination particles between horizontal plates. The differential equation of the motion takes the next form in projection on vertical axis:

$$m\ddot{y} = mg - F_A - F_C,$$

where m, F_A, F_C, are the mass of contamination particle, buoyancy force and drain resistance force, respectively.

If to consider the contamination particle as the ball with diameter d, then:

$$m = \frac{\text{p}d^3}{6}\text{c}_*,\ F_A = \frac{\text{p}d^3}{6}\text{c}g,\ F_C = 3\text{p}d\text{н}\dot{y},$$

where c_* and c are the density of contamination particles and density of the liquid, where they are, respectively, and н is kinematic coefficient of liquid viscosity.

Taking into account above mentioned ratio, the differential equation of contamination particle motion takes on form:

$$\frac{d^2y}{dt^2} + a\frac{dy}{dt} = b, \tag{5}$$

where $a = \frac{18н}{c_* d^2}$, $b = g(1 - \frac{c}{c_*})$.

The equation (5) should be supplemented by initial conditions:

$$\text{if } t = t_0 = 0 \text{, then } y(0) = 0,\ V_y(0) = \dot{y}(0) = 0. \tag{6}$$

If to solve the differential equation (5) by variable separation method, taking into account initial conditions (6), then:

$$\frac{dV_y}{dt} = b - aV_y \Rightarrow V_y = \frac{b}{a}(1 - e^{-at}),$$

$$V_y = \frac{dy}{dt},\ \frac{dy}{dt} = \frac{b}{a}(1 - e^{-at}) \Rightarrow y = \frac{b}{a}t + \frac{b}{a^2}(1 + e^{-at}).$$

The maximal rate of particles motion is calculated by ratio:

$$V_* = \lim_{t\to\infty} V_y(t) = \lim_{t\to\infty}\left[\frac{b}{a}\left(1 - e^{-at}\right)\right] = \frac{b}{a},\ V_* = \frac{g(c_* - c)d^2}{18н}.$$

The equation of particle motion has the form:

$$y = V_*\left[t + \frac{\left(1 + e^{-at}\right)}{a}\right].$$

Taking into account that the height of flow passage equals to *h*, the time for particle sedimentation t_1 is calculated by the ratio:

$$h = V_*\left[t_1 + \frac{\left(1 + e^{-at_1}\right)}{a}\right].$$

his transcendental equation can be solved by graphical method or by calculation on computer.

Conclusions

Theoretical analysis of the equations and experimental checking found that:

– with increase of pumping rate and liquid viscosity the filtration coefficient decreases;

– increase of liquid viscosity and inductive capacity leads to decrease of purification efficiency.

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K. Bondarenko, post-graduated student,
S. Boichenko, Professor,
(National aviation university, Ukraine)
V. Kirichenko, Professor,
(Khmelnitsky National technical university, Ukraine)

PROSPECTS FOR PRODUCTION AND USE OF BIOBUTANOL AS AN ALTERNATIVE FUEL IN UKRAINE

The review of the ways of power and environmental problems solution by introducing the biofuel of the second generation – biobutanol in Ukraine is presented in the article. Advantages of biobutanol application as an alternative fuel are considered.

At the beginning of the new millennium almost the whole world ran into a new very complicated problem – depletion of fuel reserves of the planet. In the XX century fossil sources fully provided power necessities, but in XXI - the situation has changed dramatically. Consumption of primary energy resources in the world grows steadily [1]. Thus, for the last 100 years the consumption of primary energy resources has grown 17-fold. The pattern of consumption of primary energy resources has changed as well. In 1900 consumption of petroleum reached 3,8 %, natural gas - 1,4 %, renewable sources of energy - 0,4 %, nuclear energy - 0 %, coal - 94,4 %, in 2000 consumption of petroleum made up 38,2 %, natural gas - 24,0 %, renewable sources of energy - 6 %, nuclear energy - 7 %, coal - 24,4 % [3].

The problem of environment pollution appeared with the fuel problem. In 2010 the consumption of primary energy resources has resulted in 120 billion tons of SO_2 emitted in the atmosphere, the following consequences are difficult to predict.

Therefore humanity must urgently find possibilities and ways of transition from conventional fuels based on petroleum to new alternative types of fuel for ground and air transport. Firstly, it is necessary, because exhaust gases of combustion engines result in further increase of concentration of carbon dioxide in the atmosphere that causes «greenhouse effect». Secondly, Ukrainian national reserves provide with petroleum from the cost of which grows constantly 10-12%.

Today bioethanol and biodiesel are the main products of biofuel industry.

The next important stage of biofuel development, able to satisfy the growing needs, is biobutanol, whichis environmentally safe, renewable transport fuel, received in the process of vegetable oils re-esterification [4].

Butanol, C4H10O, is butyl alcohol. It is colourless liquid with a characteristic smell. It is widely used in industry. 1,39 billion liters of butanol are annually produced in the USA, ant it worth approximate $1,4 billion

The production of butanol has begun at the beginning of XX century with the use of bacterium *Clostridia asetobutylicum*. In the 50th due to decline of oil prices petrochemicals were used for its production.

Butanol does not possess corrosive properties, can be transported via the existing infrastructure. It can be mixed with traditional fuels, but it is not compulsory.

Energy of butanol is close to the energy of petrol. Butanol can be used in fuel elements and as an initial material for production of hydrogen.

The possible raw materials for production of biobutanol are sugar-cane, beet, corn, wheat, manioc, and in the future cellulose.

Technology of biobutanola production is developed by the DuPont Biofuels company. The Associated British Foods (ABF), BP and DuPont companies build in Great Britain the factory on production of biobutanol, its capacity is 20 000 liters a year of different raw materials.

The use of biobutanola as a fuel provides the following advantages:

• biobutanol can be added in higher concentrations, than bioetanol, at the use in standard

motor-car engines (presently biobutanol can be added to the petrol in concentration to 10% in Europe and to 11.5% in the USA without alteration of engine);

• works well in modern transport vehicles engines;

• at presence water the mixture, containing biobutanol, is subjected to stratification at lower degree, than mixtures of ethanol / petrol, and it allows usage of the existent distribution infrastructure, not requiring modifications of mixing, storage or filling facilities;

• unlike methanol, butanol is not corrosive, therefore it does not require considerable change of combustion engines and service infrastructure;

• unlike existent biofuels, biobutanol potentially can be transported via pipelines; i.e. it can be quickly added to petrol [5].

The use of biobutanol as a biofuel has other advantages, except technical presented above - the dignities - they can be divided on 2 groups – environmental and, what is the most important, economic.

Environmental.

Biobutanol will provide considerable environmental advantages on comparison with conventional fuels, including lower level of emissions of greenhouse gases and, possibly, decrease of carbon dioxide content in the atmosphere.

It is connected with the fact, that the plants, used as raw materials for production of biotopliv, uptake carbon dioxide from the air, while they grow. Even taking into account those greenhouse gases, which appear at production of biofuel, the combined effect, however, is weaker, than at the use of traditional fossil fuels.

Presently DuPont and BP companies conduct the detailed calculations for biobutanol on emission recommendations within the framework of the GHG Well-to-Wheel/Life Cycle Analysis programs. Preliminary data show, that the use of identical raw material biobutanol gives reduction to emission, at least, at the same level, that and ethanol.

Low vapor pressure of biobutanol (lower, than that for petrol) means, that it shouldn't result in appearance of high levels of the VOC emission (i.e. there is no necessity to decrease vapor pressure).

Conclusions

The caloric value of biobutanol is closer to petrol, than to ethanol, i.e. at the use of biobutanol users run into less compromises on the economy of fuel - it is especially important, because the portion of biofuel in fuel mixtures is currently increasing.

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UDC 665

L. Cherniak, PhD in Technical Sciences
M. Radomska, PhD in Technical Sciences,
S. Boichenko, Professor
(National Aviation University, Ukraine)

MODERN METHODS OF FILLINGS STATIONS NEGATIVE INFLUENCE PREVENTION

The independence of fuels losses from evaporation with fuels quality is considered in the article. The research results of efficiency of modern methods for prevention of fillings stations negative influences caused by evaporation are presented.

Prevention of fuels losses is the one of the main directions of fuel and energy resources saving, that plays an important role in development of the economy. The substantial source of saving oil resources is prevention of losses during their transportation, storage and usage. These losses appear for various reasons and have different character and they can be divided into natural, operating and emergency.

The problem of losses of fuels is not economic and power problem only, at first it is an important environmental problem. In fact, fuels loses get into the environment, contaminate soil, underground water and atmospheric air.

Organization of economy of fuels assumes a systematic comprehensive observing, systematic minimization and removal of all types of losses, at all stages of motion to the. In the last decades the problem of losses of fuels from evaporation was intensively in connection with of environmental situation, growing of cars and objects of their and service. It enhancement of European requirements fuel quality, used for motor transport, and to the fuels emissions into the atmosphere.

The analysis of quantitative fuels losses from evaporation has shown, that the most of fuel losses from evaporation take place on the refuelling stations. According to the statistic data the retail market of Ukraine includes more than seven thousand filling stations. The total annual evaporation losses of fuels at refuelling stations are considerable enough and they have negative influence on the economic and environmental parameters of these objects activity.

Therefore the question of prevention of all types of fuel losses on refuelling stations with the purpose of diminishing their negative environmental impacts is very acute.

In any tank, which is filled with gasoline, air-steam mixture, which contains certain petrol vapours, appears the surface of the fuel. Implementation of all technological operations with petrol is accompanied by losses with evaporation (fig. 1).

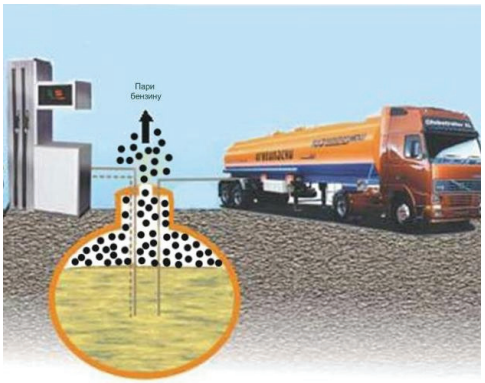


Fig. 1 Refuelling stations

The simple calculation shows that in the process of filling 1 $м^3$ of fuel the steam-and-air mixture, containing from 1,1 to 1,6 kg of petrol is displaced into the atmosphere. Taking into account the fact, that consumption of gasoline in Ukraine makes up about 8 million a year the total losses from evaporation are 14,300 tonnes.

This problem appears to be especially acute for the filling stations, that are located within urban areas. Special characteristics of filling stations include delivery of the small volumes of fuel from relatively big reservoirs and high reservoir circulating ratio, which causes considerable evaporation losses and makes impossible the efficient application of fuel losses prevention systems that are typical for reservoirs of refineries and petroleum storages.

To provide capture of vapours on refuelling stations simple, technologically reliable and low-cost method is necessary. Among the traditional methods the most popular are adsorption systems of volatile compounds capture. However, that types of systems use industrial brands of adsorbents (and silicagels), which either require additional desorption in the existent systems, or are mechanically, that results in contamination of petrol.

The application of these type of systems will be advantageous, in case of usage of adsorbents, which simplify the process of desorption and have high mechanical durability. Namely, the necessary adsorbent must meet the following requirements:

- it must be non-polar, thus adsorption force depends on molecular mass of sorbate;
- secondly, it must have such porous structure, that will prevent the capillary condensation during absorption of fuels hydrocarbon vapours;
- thirdly, it must be mechanically and able to extinguish flame.

The presence of such type of adsorbents will simplify the fuel vapours capturing systems and will enable the process of sorption according to regenerative scheme. Its essence is the process of adsorption and desorption by Henry's isotherm.

All these facts induced the research of possibility synthesize non-polar, non-combustible and mechanically stable adsorbent for the systems of volatile fractions capture. Such adsorbents can be the organic-silicon sorbent.

The first stage of research was the synthesis of the basis of polymethylthiloksan - the porous polyorganic thiloksan as a result of hydrolysis of organsilicon monomers with formation of different of silicon – silanols. The latest are, as a rule, and yield to condensations reaction with formation of siloxanes to a certain degree. Depending on the hydrolysis conditions the structure of reaction products to a great extent. Therefore, to develop non-polar nature of surface the synthesis of three of adsorbents. Consequently, it was established, that the base of PMS had actual non-polar surface.

The second stage was research of surface of the synthesized adsorbents to define the quality of porous structure, which had to provide capillary condensation for the value of 0,5 p/ps.

The porous structure of the synthesized adsorbents was determined with gravimetric method of adsorption of hexane and methanol. The adsorption isotherms are of S-type, they belong to the IV type and are characteristic for methor-typ materials. It is set that capillary condensation of the base of PMS gives the value of relative pressure of 0,5 p/ps.

Having information about the porous structure of the synthesized adsorbents (table 1), we came to the conclusion about the similarity of surfacePMS type to those of industrial brands of adsorbents, which are have the highest value of adsorption of fuel hydrocarbon vapour, namely silicagel brandsof KSK and carcoal adsorbent of SUA. This sorbent was named «Kreosorb».

In order to study the nature of adsorbents kinetics surface the adsorption was studied by the exsiccator method at temperatures 20 °C by sorbates types, which are present in steam-air mixture of reservoir, filled with the most volatile petrochemicals, likes pentene and hexane; benzol, as toxic component; and also undecane (the hydrocarbon with the low boiling temperature), methanol and ethanol. On the basis of information on kinetic dependences, certainly, the «Kreosorb» was seen to have the highest adsorption rate among the investigated samples. It is set that with the increase of molecular mass of hydrocarbons by one Cn_2 group time of saturation grows twice at temperatures 20 °C.

The same tendency is defined in the kinetics of benzol adsorption with the «Kreosorb». The level of adsorption 1,5 grammes/gramme. As for adsorption ability of «Kreosorb» in relation to alcohols, it is a bit higher and reaches 1,5 grammes/gramme for methanol, and 1,12 grammes/gramme for ethanol.

Table 1

Comparative descriptions of sorbents

Type	Brand	Total volume of pours, c^3/g	Specific surface, m^2/g	Middle radius of pours, A
1	*2*	*3*	*4*	*5*
Silicagels	KSS-3	0,925	522	35,4
	KSK	0,76–0,93	250–270	61–75
Coal adsorbent	SUA	1,22	–	–
	SKT	0,83	620	-
PMS	"KREOSORB"	1,45	148	33
	PMS+TEK	2,1	60	63
	PMS+VTMS	0,9	46	73
	PMS+GMDS	1,26	150	34

Thus, «Kreosorb» is characterized by the best indexes of adsorption components of steam-air mixture of gasoline reservoir.

The next stage of research was the study of kinetic dependences adsorption of hydrocarbons mixture, which form steam-air mixture of reservoir, filled with gasoline.

The results of research of adsorption of mixtures of hexane, hendecane and benzol in different volumes have shown that «Kreosorb» has the best values of adsorption of mixture with a 80% of alkanes. The same tendency was defined during adsorption of mixture with equivalent of hexane, hendecane and benzol.

Having defined the regularities of high-quality static researches of adsorption kinetics, it was necessary to dynamic dependences of the process on the stationary layer of adsorbent. The dynamic laws of process of adsorption on the pilot installation, that allows to simulate conduction of technological operations with a fuel.

On the basis of the technological calculation were conducted and it was set that the application of «Kreosorb» adsorbent enables process of adsorption according to the regenerative scheme (fig. 2).

The results of the conducted researches allowed to offer adsorption technology of fuel vapours capture at filling stations, in which«Kreosorb» is used as an adsorbent.

The basis of the offered technology is, that gasoline vapours, situated above the surface of fuels, pass through the corps of adsorption block, filled with «Kreosorb» adsorbent, intended for absorption of hydrocarbon vapours of fuels before outputting to the atmosphere.

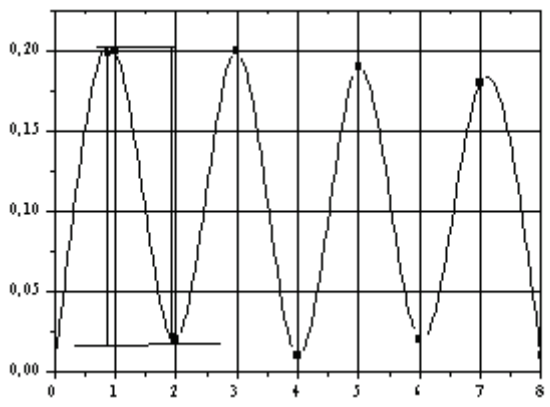


Fig. 2. Working characteristic of the developed technology

Summarizing the information about interaction of filling stations with the environment, it is

possible to recommend implementation of the following measures, aimed at the increase of general environmental safety and economic efficiency of filling stations:

To strengthen the requirements to the systems of petrochemical vapours capture on refuelling stations in the direction of introduction of the systems of light factions capture, for example systems based on application of "Kreosorb". To apply additional methods of rainwaters treatment on refuelling stations. To provide implementation of additional requirements of environmental safety, in accordance with Annex 7.2 to DBN 360-92**.

To introduce the obligatory system of monitoring within the limits of influence of refuelling stations:

to supply modern tools of measuring the level of atmospheric air pollution with gasoline (for example, using acustic-optical sensors);

conduct periodical determination of soil pollution with petrochemicals;

periodical control the condition of underground waters, located in the impacts zone;

to control the content of contaminants in rainwaters before their discharge in the city sewage system.

To provide fulfilment of the plan of obligatory periodic technical diagnostics of equipment at refuelling stations .

To introduce municipal system of filling stations certification „EKOAZS" for stimulation of activity of these enterprises in the sphere of environment protection.

To introduce the system of environment management. To conduct periodic internal audits for the evaluation of environmental management quality.

Conclusion

So, the modern method of evaporation losses prevention based on adsorption system of volatile fractions capture at filling stations, provides considerable decrease of negative impacts of these stations on the environment. Efficiency of hydrocarbon vapors capture by this method reaches 90-98 % depending on current conditions at filling stations. To increase environmental safety of filling stations it is offered to form the special program of monitoring; to strengthen the requirements to water treatment and energy saving systems; to improve the regulations; to conduct the certification of filling stations on the basis of their environmental safety.

UDC 621.891

I. Trofimov, PhD in Technical Sciences
(National Aviation University, Ukraine)

INFLUENCE TREATED OF TS-1 JET FUEL WITH ELECTRIC FIELD ON HIS ANTIWEAR PROPERTIES

A method for testing of anti-wear properties of fuels and low-viscosity fluids processed with electric field for "cylinder - the plane" tribological contact scheme has been developed. The influence of an electric field on the antiwear properties of TS-1 jet fuel has been studied.

Wear of machine parts and mechanisms is one of the most difficult problems of modern technology. Continuous improvement of modern machines and mechanisms is directly related to improving the quality of fuel and lubricants (F&L). Improving the quality of lubricating medium (LM) in most cases can generally improve the reliability and efficiency of all mechanical equipment. Modern technology has very high reliability, but despite this, it should be taken into account that it is equipped with sophisticated hydropower units, performing important functions such as control systems in aircraft and fuel automation of aircraft engines, fuel systems in internal combustion engines and in ground equipment control systems.

Reliability of fuel and hydraulic aggregates largely depends on the uptime of friction pairs, which serve as sensory elements of automatic regulating devices, displace elements of pumps, hydraulic equipment distribution elements and other equally important components. Due to increased wear, fracture and wedge of friction pairs hydraulic failure appear, causing a need for early removal of these units out of service. The specificity of these pairs of friction requires a critical approach to these issues as for application of existing ideas concerning the impact of LM, the mechanical properties of materials; conjugate surfaces roughness, relative speed of their movement.

Today, requirements for F&L, the regime and characteristics of their operation in different conditions determine the need to improve anti-wear properties of F&L and searching for new directions and methods for achieving this.

Due to the sharp price increase of natural resources, restoring and improvement of antiwar properties of fuels and oils is an actual scientific and technical problem of modern Tribology. Increasing anti-wear properties of fuels and lubricants and development of devices for their implementation is one of the priorities of increasing the reliability of machines and mechanisms.

Problems as for the impact of electric field on the anti-wear properties of fuels and lubricants remain open. Therefore, it was decided to assess the impact of electric field on liquid hydrocarbons, testing antiwear properties of some F&L.

Problem formulation

The goal of this work was to study anti-wear properties of jet fuel TS-1 treated with electric field and to develop a test of anti-wear properties of F&L under the "cylinder – plane" tribocontact scheme.

Analysis of previous research and publications

Analysis of [1-3] shows that the problem of increasing anti-wear properties of fuels and oils has been examined repeatedly. In these works, the basis for recovery of waste lubricants was taken in a form of various technological operations, based on physical, physics-chemical and chemical processes to remove aging and contamination products. In [2] special attention is paid to solving such important issues as protection against corrosion and mechanical wear, protection against oxidation, resistance of lubricants to foam formation, preserving performance properties in a wide range of temperatures.

Work [4] shows that one way of improving performance properties of fuels and lubricants is the electrical treatment, which takes place by passing fuel through a magnetic field, while imposing

high-frequency electromagnetic field with frequency equal to the frequency of precession of protons in this magnetic field. The authors of this paper found that the electrical treatment of diesel fuel reduces the time and specific fuel consumption by 2-4% at all frequencies of rotation of the crankshaft, although the greatest effect was observed at idle (fuel time consumption decreased by 8-12%). In the study of anti-wear properties of diesel fuel L-0,2-40 and L-0,5-40 it was found that electrical treatment leads to reduction of wear of SHH 15 steel friction pair in sliding friction by 40-45% and 33-38% respectively.

Number of the researchers proved that the processing of fuel with electric field, aerodynamic and electrical forces also act on directed in the opposite direction and conditionally lower the surface tension drops, thus, resulting in a fine spray of fuel, better combustion and, consequently, lowering the toxicity of the exhaust gases [4 - 5]. It has been proved that the effect of electromagnetic fields on water, motor oils and special fluids causes the change of surface tension, viscosity and density [5]. A significant change in flow regime (increasing the number of drops and decreasing their size) happens at the expense of lowering the surface tension as a result of the application of external electric field of high tension to F&L.

The authors of this work developed, manufactured and tested a device for improving anti-wear properties of fuels and lubricants [6]. The device is characterized by compactness, ease of use, and low manufacturing costs. For the proper implementation of the specified device, the fundamentally new method for improving anti-wear properties of F&L has been developed, which allows improving anti-wear properties of fuels and oils quickly at a new level [7, 8]. The experiments with thee influence of electric field on the anti-wear properties of fuels and oils showed satisfactory results, which were detailed in the work [8]. In this case, the test of anti-wear properties of fuels and lubricants were performed using a friction machine according to the scheme "disc - plane" linear contact; material samples included SHH15-SHH15.

Such well-known and certified methods of testing anti-wear properties of fuels and lubricants, as a method of determining anti-wear characteristics of lubricants in the four ball friction machine (GOST 9490) [9] and the method for determining anti-wear characteristics of lubricants using a friction machine SRV (ASTM D 5706-97) [10] are now widely used. There are also common methods for determining the tribological performance of lubricants with the 3 stage technique and a method of determining the tribological characteristics of F&L with a "roller-drive" scheme.

Comparative studies of F&L with different friction machines showed that in most of the cases only in machines with "linear contact" a relative compliance of test results for the same evaluation criteria of lubricating ability is observed in the form of a limit load before the appearance of a bound [2].

It is known that tests using four ball friction machines have such advantages as sufficient homogeneity of friction surfaces of working machine parts with a respect to surface quality, size and hardness, and that during testing there is almost no change in conditions of the lubricating film [9].

Research method developed and described in detail below also has all the specified advantages. However, if testing F&L with a four ball machine, not a significant amount of wear is obtained in friction of homogeneous solid spherical surfaces. When testing fuels and lubricants, which have high anti-wear properties, the magnitude of wear is very small, and in order to obtain optimal measurement spots it is needed either to extend the way of friction, or significantly increase the speed of sliding or loading. Also in this case the measurement of a medium contact spot of lower balls takes sufficient time and requires researcher’s accuracy of measurements. In general, this problem occurs in the tests of any pair of friction when a solid material rubs against a solid. Such friction pairs as "shaft - block", "cylinder - the plane," "ring - ring", "roller - drive" are not exceptions. When a solid material rubs against a soft one, especially on a "cylinder - the plane", we get a pair of friction, which is closer to the real one and models "shaft - bush" pair. The amount of wear (linear, volumetric, by weight) is greater than in the case with two identical by hardness samples. In this case, the measurement of the amount of wear becomes easier with the use of conventional profilometers and micrometers, and does not take much time.

For comparison of anti-wear properties of the two tested lubricants, it is enough to discover, in which case there is a greater or lesser amount of wear.

In our case, the main objective was to compare the anti-wear properties of fuels and low viscosity fluids in the state of supply and processed with an electric field. In this case, the lubricating medium must be submitted to a pair of friction immediately after processing by the electric field, which requires the structural improvement in friction machines and developing new methods for studying anti-wear properties of fuels and lubricants.

Methods and results of the experiment

In order to investigate the anti-wear properties of fuels and lubricants, processed with the electric field, a technique for examining anti-wear properties of fuels and low-viscosity fluids using a "cylinder - the plane" scheme with cylinder tribocontact and material samples of "9HS steel-LS59-1 brass" has been developed. A choise of a friction pair was determined by the fact that modern technology, particularly in hydraulic systems with plunger and plate pairs, mostly works with a pair of friction of steel and copper alloy in a tribocontact.

Testing of anti-wear properties of fuels and lubricants was carried out using the technique developed in the laboratory for tribo-technical tests and studies of the National Academy of Sciences of Ukraine and the Department of Engineering, Production and Recovery of Aircrafts of the National Aviation University.

The device is designed to determine tribotechnical properties of materials, coatings and low-viscosity fluids. A flat sample with a given normal load in a defined liquid medium is pressed to the rotational cylinder-counter sample. As a result of friction the working surface of the sample wears out and workin-off in a form of a segment hole is formed. After the test specimen measured geometric dimensions of developing and calculated parameters of linear and volumetric wear intensity.

Working surface of a counter-sample, which performs relative rotational movement, has a diameter of 60 mm and a width of 10 mm, and is made of 9HS steel and tempered to the hardness of HRC 62. Working surface of the stationary flat sample with a length of 40 mm, a width of 30mm and thickness 3mm is made of LS59-1 brass. If necessary, samples with steel, hardened to the hardness from the minimum to the hardness of counter-sample can be used. The sample, the counter-sample, and all mounting details were washed with acetone and dried before conducting tests for cleaning surfaces from residues of products of machining and fuel.

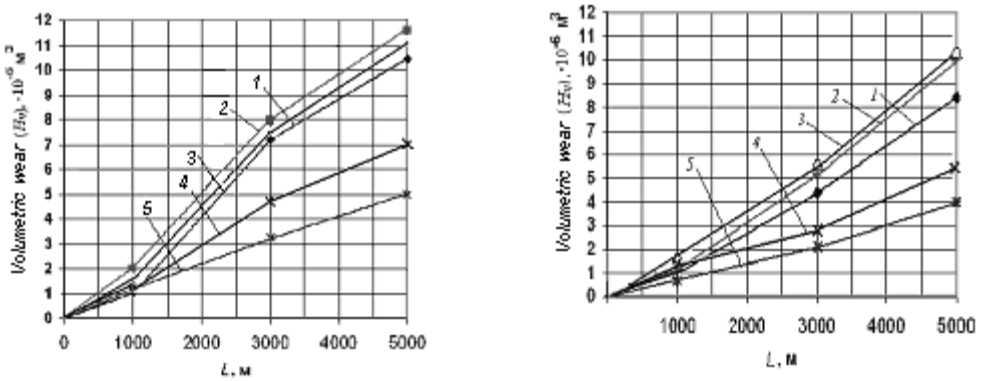
A jet fuel TS-1 was selected as a test fuel, since it has low anti-wear and low rheological properties, and certainly allows to provide a boundary lubrication. Processing the TS-1 jet fuel with an electric field was carried out for 1 hour at voltage being U = 2000 V and the field intensity $E = 1{,}1 \cdot 10^6$ V/m. The methods for the processing of fuels and lubricants with an electric field are described in [7].

It was found that the nature of relationships of a volumetric wear and a friction path is similar for different sliding speeds and normal loads for different samples working in the base TS-1 jet fuel and processed in an electric field. However, there are significant differences (Fig. 1 - 2):

First of all, at similar values of sliding velocities, the values of volumetric wear working in an electrically treated TS-1 jet fuel are 1.2 ... 1.4 times smaller than for the samples produced in the base jet fuel. And for the same values of normal loads volumetric wear of samples working in the electrically treated TS-1 jet fuel are 1.2, 1.1, 1.3, 1.15 times smaller at P = 10, 15, 25 and 30 kg respectively and at P = 20 kg they are 1.25 times larger than for samples working in the base jet fuel;

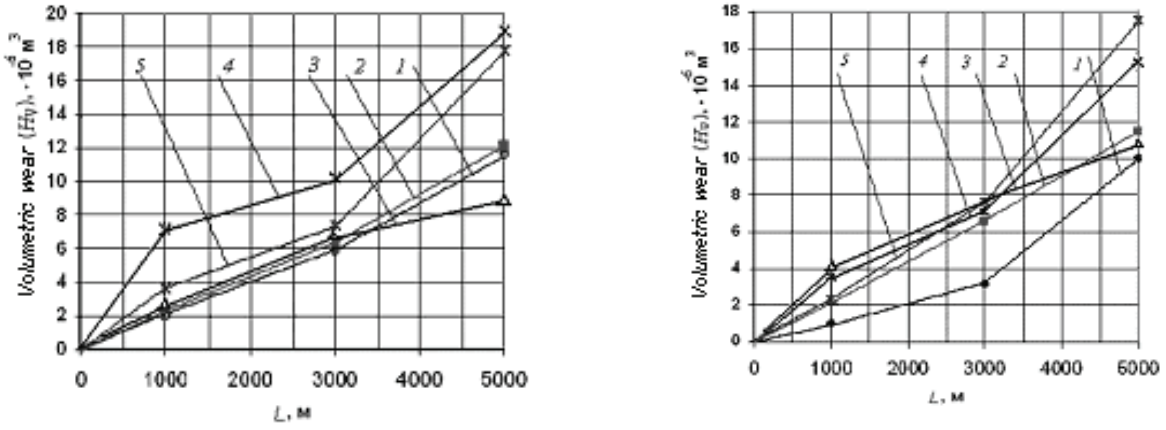
Secondly, an increased wear for samples processed in the base TS-1 jet fuel begins at values of sliding speed at 0,55 ... 1,38 m/s at sustained normal load, and for the samples processed in electrically treated jet fuel are at 0,84 .. .1,38 m/sec speeds. There is a constant wear resistant area increase, which leads to broadening the range of normal operation of constructional parts with increasing sliding speeds.

Thirdly, with increasing of a normal load, the values of volumetric wear gradually increase and at P = 20 kg rapidly decrease. Furthermore, with increasing of a normal load up to 25 and 30 kg, the values of volumetric wear increase significantly. Thus, the optimal normal load for LS59-1 brass is 20 kg in this tribological joint.



a) *b)*

Fig. 1. The dependence of volumetric wear value from the friction path during the study of anti-wear properties of a basic TS-1 jet fuel (a) and TS-1 jet fuel (b) processed with electric field for one hour at voltage U = 2000 V and a field strength $E = 1{,}1 \cdot 10^6$ V/m at a normal load P = 10 kg: *1* - ϑ = 0.550 m/s; 2 - ϑ = 0.847 m/s; 3 - ϑ = 1.38 m/s, 4 - ϑ = 2.196 m/s, 5 - ϑ = 3.36 m/s



a) *b)*

Fig. 2. The dependence of volumetric wear value from the friction path during the study of anti-wear properties of a basic TS-1 jet fuel (a) and TS-1 jet fuel (b) processed with electric field for one hour at voltage U = 2000 V and a field strength $E = 1{,}1 \cdot 10^6$ V/m at a sliding speed ϑ = 0,847 m/s*: 1 − P* = 10 kg*; 2 − P* = 15 kg*; 3 − P* = 20 kg*; 4 − P* = 25 kg*; 5 − P* = 30 kg

Conclusions

A technique for examining anti-wear properties of fuels and low-viscosity fluids treated with electric field in "cylinder - plane" tribological contact scheme has been developed. The main experimental results are the following:

- For the same values of sliding velocity, the values of volumetric wear of samples processed up in the electrically treated TS-1 jet fuel are 1.2 ... 1.4 times smaller than for the samples processed in the regular jet fuel;

- For the same values of normal loads, volumetric wear of the samples processed in the electrically treated TS-1 jet fuel are 1.2, 1.1, 1.3, 1.15 times smaller at P = 10, 15, 25 and 30 kg and, at P = 20 kg, are respectively 1.25 times larger than for the samples processed in the regular jet fuel.

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UDC 504.064.2:620.92(045)

M. Radomska, PhD in Technical Sciences
(National Aviation University, Ukraine)

COMPARATIVE ANALYSIS OF ENVIRONMENTAL SAFETY OF ALTERNATIVE AVIATION FUELS

The potential impacts of alternative jet fuels are discussed in the article. The most important environmental prerequisites of alternative fuels application, especially feedstock base and influence on global warming processes, were considered. The potential consequences of alternative fuels spills for environment components were studied. The possible health hazards of alternative fuels were analyzed.

Aircraft and engine companies are currently investigating possibilities for substitution of conventional fuels. The motivation to develop alternate fuels for commercial aviation is twofold. First, with respect to near-term concerns, alternate fuels will relieve the worldwide pressure on crude oil derived fuels. This will help to stabilize price fluctuations. Secondly, with respect to mid-term concerns, alternate fuels should increase environmental performance of air transportation, including a substantial potential for reduction of CO2 emissions over the life cycle.

The type of fuel of immediate interest to aviation is termed a “drop in” fuel (i.e. direct replacement) as one that can be blended with, or completely replace, Jet-A without necessitating any substantial modifications to engine or aircraft. From this position aircraft research and development communities have been investigating the practicality of using alternative fuels in near, mid, and far-term aircraft. The successful solution of this task will have to balance technical, economic and environmental issues.

Presently, it appears that an approach of using a “drop in” jet fuel replacement, which may consist of a kerosene and synthetic fuel blend, will be possible for use in existing and near term aircraft. Future mid-term aircraft may use a bio-jet and synthetic fuel blend in ultra-efficient airplane designs. Future, long-term engines and aircraft in the 50-plus year horizon, may be specifically designed to use a low or zero-carbon fuel.

Synthetic jet fuels are manufactured, using a Fischer-Tropsch (FT) process, from coal, natural gas or other hydrocarbon feedstocks. These fuels are very similar in performance to conventional jet fuel, but have almost zero sulfur and aromatics. This may result in lower particulate exhaust emissions. In addition, synthetic fuels exhibit excellent low-temperature properties, maintaining a low viscosity at lower ambient temperatures. Thermal stability properties are also improved, resulting in less fuel system deposits. As synthetic fuels have very good performance, and have already been in use for many years in Johannesburg airport (Sasol fuel) it will be easy to supplement current jet fuel supplies with synthetic derived fuel. The only problem, which is still in place is the additional CO_2, produced during the manufacturing process, it should be captured and permanently sequestered to make synthetic fuel good near-term supplement.

For a possible mid-term solution (i.e., 10-50 years from now) it is envisioned that alternative fuels will make up a much larger percentage of jet fuels. These fuels may also involve the blending of bio-fuels with the synthetic fuel. The major challenges of using pure biofuels in a commercial aircraft are their propensity to freeze at normal operating cruising temperatures, poorer high temperature thermal stability characteristics in the engine, and storage stability over time. For these reasons, bio-jet fuels need to be upgraded to address these issues and so will be especially tailored for jet aircraft. Long-term solutions will need to dramatically reduce the emissions of greenhouse gases. Therefore, alternate fuels with low to zero carbon content, such as liquid hydrogen or liquid methane, might be used. To use liquid, cryogenic fuels in aircraft engines, modifications are necessary to the combustor and fuel system components. Early tests with cryogenically stored fuels demonstrated that a heat exchanger will be required for vaporizing the fuel prior to combustion. Compromises are necessary to the airframe to address fuel tank insulation requirements and pressure issues. On the other hand, vast quantities of methane currently trapped in the forms of

methane hydrates could become readily available in the future.

Either of these new aircraft fuels will require an enormous change in infrastructure and engine-airplane design. First of all, many life-cycle environmental questions will need to be addressed, among them the most important are:

- environmental impacts of raw materials provision;
- potential contribution in global climate changes;
- human health hazards;
- assessment of potential impacts on environmental components.

The most controversial environmental impacts of raw materials provision are connected with biodiesel production. Plant derived fuels include feedstock derived from soybean oils, palm oils, corn, switch-grass and algae. These resources are considered renewable, but most would require large areas for plant nurturing. But due to limited excess farmland, present bio-fuels are not capable of supplying a large percentage of fuel without displacing food production. Moreover, in order to create sufficient farm land capacities, deforestation, using slash and burn practices, can take an extreme toll on rainforests. The resulting CO_2 emissions are anticipated to exacerbate global warming issues. At the same time growing plants for fuel production often results in immense soil destruction and fertility loss. Thus, great care has to be taken to assure that bio-feedstock is sustainable and will not cause new anthropogenic issues through deforestation. However, higher yielding future feedstocks, such as algae, may dramatically improve supply capability.

The advantages of using bio-fuels would be its environmentally balanced CO_2 impact, which may even contribute to reduction of carbon dioxide by its consumption in the process of plants vital activity. Finally, it may result in lower engine emissions. Another perspective candidate feedstock for FT plant processing is natural gas and coal. Currently, FT fuels with Jet-A blends can be considered as “drop in” fuels. The positive environmental attributes of these fuels include: cleaner burning process with no sulfur compounds emissions, and lower particulate engine emissions. The most important drawback is increased CO_2-emissions during its manufacture: large quantities of energy are used during the FT manufacturing process that release about 1.8 times more CO_2 into the atmosphere as compared to crude oil derived jet fuel. Potential application of methane gas, trapped in the forms of methane hydrates, rises a lot of questions with respect to technology and environmental impacts of its extraction and recovery. On the other hand, extraction of these deposits in permafrost areas may be required in order to help control global warming. As the earth and oceans warm, the deposits presently locked under permafrost may become exposed. The methane released could be a far more potent greenhouse gas contributor than CO_2 is today. The vast number of alternative fuels imposes serious problem when trying to evaluate their potential impacts on environment components. It is even harder, because the buildings or facilities used for storing, loading, maintaining, and fueling alternative fuel vehicles are not yet provided with fire and building codes and regulations. This requires additional care to consider all hazards and accident scenarios associated with the management and use of alternative fuels and alternative fuel vehicles.

In this case the impacts of possible fuel spills should be considered first of all. The analysis shows, that the spill or leak of an alternative fuel is not likely to result in any long term environmental damage. A review of the potential environmental hazards for each alternative fuel, that is not gaseous at normal temperatures and pressures, shows that all of the liquid alternative fuels are biodegradable over a reasonably short period of time (i.e., a period of several months or less). The major concern is that the liquid alternative fuel should be prevented from entering into any waterway or drainage system. The release of flammable liquids into a sewer system is prohibited. Aside from any consideration of aquatic toxicity, there is actually a potential fire/explosion safety hazard situation created when a flammable or combustible liquid enters a waterway where there are covered sections where vapors can accumulate. This problem is particularly acute for the alcohols (methanol and ethanol) since they are soluble in water.

One of the physical properties of methanol and ethanol that affect fuel spills is their water solubility. Normally, fuel handling facilities that have an emergency drain connecting to a sewer will have a separator or clarifier to ensure that the fuel (gasoline or diesel) will not reach the sewer.

This approach will not work with methanol and ethanol since they are soluble in water and will pass directly through the separator. Methods for separating methanol and ethanol from water exist but they are quite complex and costly. Therefore, the best approach is to ensure that any spills in a facility are absolutely prevented from entering any drain through the use of impoundment systems to contain the entire volume of any potential above ground spill. In a bulk transport situation there is obviously no way to provide such assurance for any type of liquid alternative fuel. Fortunately, methanol and ethanol are quite volatile so that they will not persist for a long period of time when exposed to the environment. Methanol and ethanol also biodegrade quickly. The only problem is their high toxicity for plants and animals exposed to potential spill. Soil condition in this case will also change, and these changes may have prolonged character due to reaction of alcohols with soil organic complexes and death of soil microorganisms.

Liquefied natural gas, as well as gas and coal derivatives cause environmental problems similar to those of traditional petrochemicals. The only important difference is that they are more volatile, do not contain heavy components, sulfur and aromatic compounds, - as a result they evaporate almost totally and the residual impacts include only potential toxic impacts for plants, and animals directly exposed to fuel. Soil pollution, caused by such accidents, may lead to plants and microorganisms communities deterioration, temporary decrease of biomass production or appearance of overwhelming population of certain species.

Biodiesel is considered to be biodegradable based on the chemical nature of the materials. Test data indicates that biodiesel is in the same range as biodegradable soaps and detergents. Therefore there are no significant environmental hazards associated with biodiesel.

Hydrogen – it is considered environmentally neutral and all hazards are related to its explosion hazard. Almost zero environmental impacts are also attributed to application of electricity as power source in aviation.

As for health impacts, most of the alternative fuels considered nontoxic, particularly when they are compared to conventional fuels such as gasoline. For most fuel health effects, inhalation of fuel vapors is the most likely exposure route. The threshold limit value for the health effects of fuel vapors is a measure of fuel toxicity. The limits for all fuels except LNG vapor (considered to be nearly pure methane), and hydrogen are based on toxic effects. The limit values for these fuels are based on the lower flammability limit and the premise that inhalation of a flammable mixture of fuel and air constitutes a health hazard. In the case of hydrogen and natural gas, excessive exposure can also result in asphyxiation. However, approximately 140,000 ppm (14 percent) of an inert gas would be required to lower the oxygen concentration of air to less than the 18 percent, the limit for a breathable atmosphere. Methanol and methanol blends are the most toxic alternative fuels. Exposure to methanol can occur through inhalation of vapor, or through ingestion or skin contact with the liquid fuel. The toxic effects of methanol are the same regardless of the means of exposure. Considering the fact that methanol is quite volatile, it is most likely that the typical route for exposure is through inhalation of methanol vapors. For methanol vapor, the TLV-TWA (threshold limit value - time weight average) value is 200 ppm, while the TLV-STEL (threshold limit value - term exposure limit) value is 250 ppm. Other alternative fuel vapors have toxicity (TLV-TWA) concentration values that are at least five times higher.

Interestingly, conventional gasoline has a TLV-TWA close to that of methanol (300 ppm versus 200 ppm) and it is more volatile. Therefore, the toxic exposure risks with both of these fuels are likely to be similar. Diesel fuel vapors are apparently much more toxic than either methanol or gasoline since the TLV-TWA value for kerosene (as a proxy for diesel fuel) is only 14 ppm. Fortunately, diesel fuel is relatively non-volatile at normal ambient temperature; therefore vapor exposure is not a significant issue. So, the toxicity of the vapors should be considered in the context of the volatility of the fuel. For example, while gasoline has a higher TLV-TWA (300 ppm) than methanol, gasoline is also more volatile with a vapor pressure (RVP) approximately 2.3 times greater than methanol; therefore, personnel working in the presence of both of these fuels are more likely to be exposed to gasoline vapors than methanol vapors. Ethanol is less toxic than methanol. The TLV-TWA concentration for ethanol vapor is 1,000 ppm compared to 200 ppm for methanol.

Extensive skin exposure to ethanol can cause redness and irritation. Concern about intentional ingestion of ethanol by employees is mitigated by the fact that alcohols intended for industrial use must be denatured in order to avoid the alcoholic beverage tax.

The principal constituents of natural gas, methane, ethane, and propane, are not considered to be toxic. Those gases are known to be simple asphyxiants, which are a health risk simply because they can displace oxygen in a closed environment. The time-weighted average (TWA) personal exposure limit (PEL) are set at the level of 1,000 ppm for propane. A number of minor constituents of natural gas have threshold limit values (TLVs), including butane - 800 ppm, pentane – 600 ppm, hexane - 50 ppm, and heptane - 400 ppm. The effective TLV for an average natural gas composition, considering all of these limits, is about 10,500 ppm. The odor threshold of odorized natural gas is about 10,000 ppm. Therefore, it is unlikely that personnel will be unknowingly exposed to the TLV concentration since they can detect it by odor. However, it should also be noted that propane has been reported to contain a relatively high level of radon gas, with radon concentrations in propane that are well above current guidelines for radon exposure. Since the exposure of personnel to propane will be limited, the potential exposure to radon gas should not be a serious problem. Because there are essentially no vapors generated at normal transport and storage temperatures, pure or neat biodiesel can only be considered as a potential health hazard due to ingestion. Pure biodiesel looks and smells like a food product and could conceivably be ingested. If biodiesel were ingested, enzymes in the body would break the ester back into its original components, e.g., soybean oil and methanol. This raises the potential issue of methanol toxicity as a potential health hazard associated with biodiesel. Consequently, biodiesel cannot be considered to be non-toxic, as often cited in the promotional literature.

Conclusion

Summarizing information about potential health and environment hazards, the considered alternative fuels may be placed in the following relative ranking: methanol/blends - ethanol/blends – natural gas derivatives – biodiesel – hydrogen and electricity. In order to be viable in the commercial aviation industry, bio-fuels need to overcome several technical hurdles. However, the task is not insurmountable, and there is no single issue making bio-fuel unfit for aviation use. Bio-fuels need to be developed and have to be especially tailored for jet aircraft applications, termed as “bio-jet.” In view of the diversity of the safety concerns, as well as the number of possible hazards, a comprehensive and systematic program is needed to recognize and organize the existing knowledge about the health, safety, and environmental hazards of alternative fuels and to identify where additional study is needed.

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E. Novoselov, PhD in Chemical Sciences
(National Aviation University, Ukraine)

NEW BIOFUEL WITH ENHANCED CHEMMOTOLOGICAL CHARACTERISTICS

High pour point and low heat capacity are determined to be the major disadvantages of biodiesel type biofuels. In our research is proposed to add a natural, biomass derived bicyclic compound into FAME type biofuel to improve its quality. Blended100% biofuel is thus obtained. Results of research of the proposed blends: the density, the kinatic viscosity, the pour point and heat capacity were investigated: measured, calculated, and analyzed.

The alternative and renewable fuels are widely applied in the developed countries, but this tendency only become to spread in the developing states. FAME type biodiesel is considered to be most perspective in comparison with the traditional fuels produced from petroleum. Nevertheless this alternative fuel has some disadvantages among which are: lower value of the heat capacity versus diesel and also a higher pour point.

Thus an improvement of FAME type biodiesel characteristics is one of the actual problems and simultaneously is a current object of many scientific research in chemmotology. Therefore removing of mentioned disadvantages gives an opportunity to apply it a wider range of applications including air transport.

FAME type biodiesel is one of perspective renewable source of energy, it is a produced from vegetable-oil fuel and usually consists of various esters of fatty acids, especially of fat acids methyl esters (FAME) [1].

Advantages of FAME type biodiesel are reviewed in a great number of publications [1,2,3,4] together with general assessment of its negative sides [2,3].

Thus benefits of the FAME type fuels application are following:

- Sulphur free;
- Biodegradable fuel;
- Usage of renewable raw material;
-Better lubricating properties that increase the Energy Conversion Efficiency (ECE) of an internal combustion engine and correspondingly its operating time;
- More fire safe because of high value of ignition temperature [1,2,4].

The disadvantages of the biodiesel application are as following:

- Short term of storage (less than three months);
- High pour point;
- Lower values of the heat capacity in comparison with traditional diesel;
- Relatively frequent change of the fuel filters [2, 3].

Information concerning investigation of various admixtures adding with a purpose to improve biodiesel quality is given in publication [2, 5, 6].

Methods of FAME type biodiesel characteristics improvement investigated and examined not completely.

Our investigation focuses on improvement of alternative fuel (biodiesel) quality by means of a high-energy component adding and analyze of its effectiveness.

Characteristics of the investigated blends methods applied

The object of investigation are blends of traditional biodiesel and biomass derived hydrocarbon in various proportions. The aim of work is assessment of biodiesel quality improvement.

The research was conducted at the Department of Chemistry and Chemical Technology in the National Aviation University.

The used batch of the traditional biodiesel corresponded to the country adopted standard DSTU 6081:2009.

For component of blend were used biomass derived bicyclic compound - hydrocarbon (1*S*,5S)-6,6-dimethyl-2-ethylenebicyclo [3.1.1] heptane ($C_{10}H_{16}$) as a High-Energy Admixture (HEA) to biodiesel. The biodiesel and HEA were mixed in various proportions:

- mixture 1: 2.5 ml HEA and 47.5 ml biodiesel;
- mixture 2: 10.0 ml HEA and 40.0 ml biodiesel;
- mixture 3: 20.0 ml HEA and 30.0 ml biodiesel;
- mixture 4: 30.0 ml HEA and 20.0 ml biodiesel;
- mixture 5: 40.0 ml HEA and 10.0 ml biodiesel.

We have measured the following quality parameters of the investigated blends: the density, the kinematic viscosity, pour (chilling) point. The heat capacity was calculated theoretically according to formula:

$$\Delta H_r^0 = \sum (n_i \Delta H_{f_i}^0)_{products} - \sum (n_i \Delta H_{f_i}^0)_{reagents}, \quad (1)$$

where H_r^0 – is value of the heat capacity of a chemical reaction under standard conditions, n_i – is the stoichiometric coefficient of reagent in chemical reaction, $H_{f_i}^0$ – is value of the heat formation under standard conditions.

The density of the investigated mixtures was measured according to the adopted standard GOST 3900–85 “Petroleum and petroleum products. Methods for determination of density”. The density of prepared mixtures was determined by means of hydrometer.

The kinematic viscosity was determined in accordance to GOST 33–2000 “Petroleum products. Transparent and opaque liquids. Determination of kinematic viscosity and calculation of dynamic viscosity” by viscometers (VPG–2).

The measurements of density and kinematic viscosity were conducted under normal condition (20^0C and pressure 101,3 kPa). The pour point was measured according to the adopted standard GOST 5066–91 “Motor fuels. Methods for determination of cloud, chilling and freezing points”. Quality assurance is guaranteed through double measurements of three replications. Statistical proceeding of received data was fulfilled with program *Microsoft Excel*.

The results of research and discussion

The density is considered to be an important fuel characteristic as it defines completeness of combustion process. The density rise causes enlargement of fuel drops and decreasing of fuel combustion effectiveness. Thus the higher value of density leads to increasing of fuel consumption.

The results of density measurement are presented in fig.1.

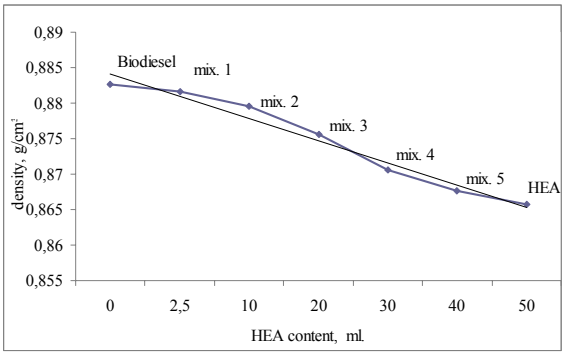

Fig. 1. The density of the investigated mixtures under standard conditions

The results obtained concerning the blends density have shown that its values decrease proportionally to the increase of the HEA part. In comparison: the density of the pure biodiesel is 0.883 g cm^{-3} and that of natural bicyclic compound is 0.866 g cm^{-3}.

The fuel viscosity also influences on combustion process – its decrease provides better fuel spraying.

The results of kinematic viscosity measurement are presented in fig.2.

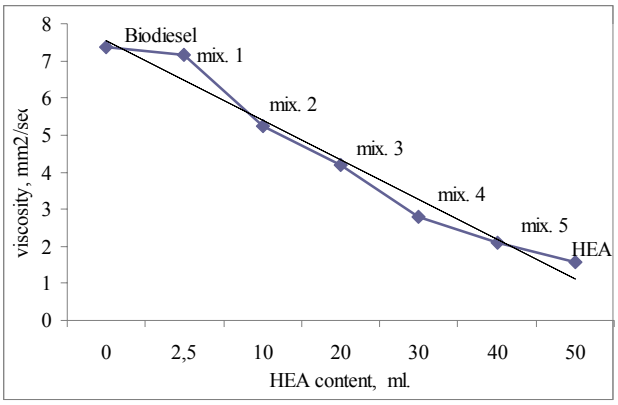

Fig. 2. The kinematic viscosity of the investigated mixtures under standard conditions

The blends kinematic viscosity measurement has shown that it decreases with increasing of HEA part similarly to density. Starting biodiesel has 8.342 mm^2/sec and proposed hydrocarbon admixture near 1.804 mm^2/sec.

It was observed that increasing of natural bicyclic compound fraction in blends leads to decrease of dynamic viscosity value. The dynamic viscosity of petroleum diesel equals to some 7.363 mPa sec, while pure HEA only1.562 mPa sec. The results of the dynamic viscosity measurement are presented in fig. 3.

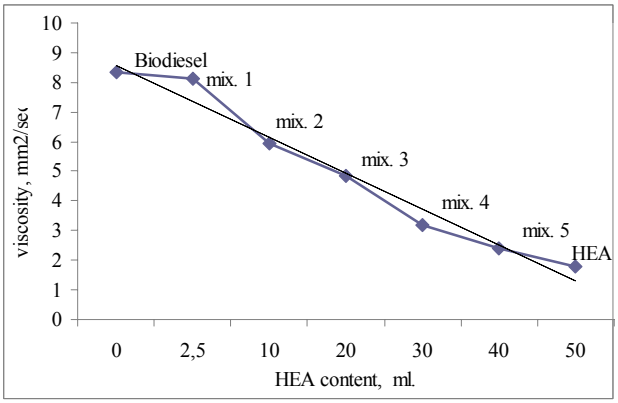

Fig. 3. The dynamic viscosity of the investigated mixtures under standard conditions

The pour point also belongs to the determinant characteristics of fuel. The low value of pour point gives an opportunity to apply biodiesel at low temperatures that can lead to its usage in wider range, particularly in aviation. The results of pour point measurement are presented in fig. 4.

The value of pour point of investigated mixtures diminishes with enlargement of HEA content, but in case of mixture № 2 and № 3 it does not change and is relatively the same. The value of pour point for a starting biodiesel is minus 10 ^{0}C.

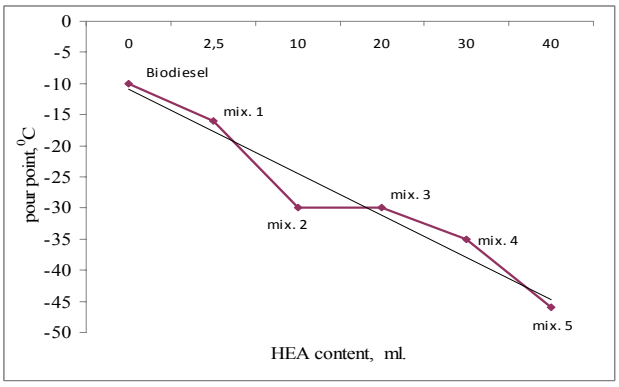

Fig. 4. The pour point of the investigated mixtures

The heat capacity is the amount of energy that is released at combustion of fuel (in this case for 1 m^3 of fuel), it corresponds to the useful energy output.

The results of heat capacity calculation are presented in fig. 5.

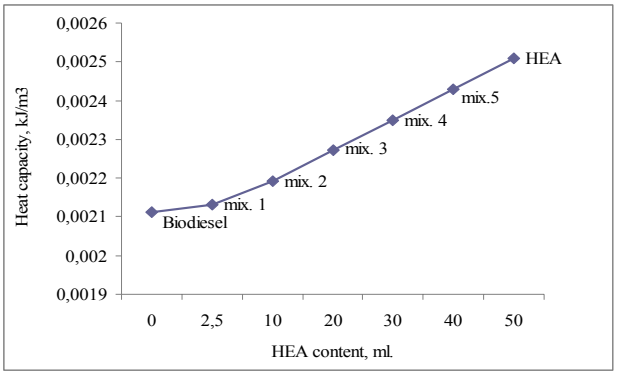

Fig. 5. The heat capacity of the investigated mixtures

Therefore addition of natural bicyclic compound influences the value of the heat capacity: increasing of HEA part in blends leads to enlargement of its heat capacity. The minimal value heat capacity of the mixture is 0,00215 kJ/m^3, while the used petroleum diesel has some lower – 0,00210 kJ/m^3. The maximal calculated value of heat capacity is equal to 0,00245 kJ/m^3 (mixture № 5).

Conclusion

1. The FAME type biodiesel is considered to be a perspective alternative fuel, but it has significant disadvantages which demands removing, among which are lower value of the heat capacity and high pour point.

2. Adding the offered natural bicyclic compound has positively influenced on FAME type biofuel characteristics: it causes decreasing of the density and kinematic viscosity, consequently increasing of fuel combustion effectiveness

3. The value of pour point for a pure petrodiesel is equal to minus 10 ^{0}C, while the minimal received value of investigated blends is minus 16 ^{0}C and maximal is minus 46 ^{0}C. Thus adding of natural bicyclic compound leads to the pour point lowering and widening of the offered fuel application range.

4. Increasing of heat capacity was also observed in investigated blends.

5. Thus adding the proposed natural bicyclic compound improves quality of FAME type biofuel and extends its application range.

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A. Leshchynska, Post graduate student,
M. Bezovskaya, Assistant,
Y. Zelen'ko, PhD in Technical Sciences
(Dnepropetrovsk national university of railway transport named after Academician V. Lazaryan, Ukraine)

IMPROVED ENVIRONMENTAL SAFETY IN THE TREATMENT OF WASTE OIL

Plenty of productions wastes appear on Ukrainian enterprises. Technological heavy mineral oils and oils apply to such wastes annually accumulating in great amounts. The method of utilization depends on composition of waste, his properties and amount.

Inefficient production and consumption structures are the main cause for crisis in the natural environment of Ukraine. They are responsible for poverty amidst the population and for disproportion in economy.

The national economy complex is still overcostly and focused at raw materials. Restructuring of the proper areasis carried out to that end. It provides for the perfection of their structures, renovating of the obsolete assets, creation of the environment friendly technologies, introduce the variety in property types, shutting down loss generating facilities and implementation the new innovation policy.

Fuel and energy complex of Ukraine is technologically obsolete, industrial and production assets have depreciation level of 65 %...75 %. There is essential lack of funds to modernize this sector. The scope of geological prospecting for oil and gas as well as commissioning of the explored deposits is not sufficient. The policy to diversify oil and gas supply is not much active. For the purpose of resolving energy problems it is necessary to suggest new sources of energy. Utilisation and recuperation of waste oils is one of such sources.

That is why our work is connected with study of formation and treatment of the oil wastes.

The important side of the solution of wastes problem is creations of rational technological processes and utilizations. One of the most widespread wastes is technological heavy mineral oils and oils wastes.

A lubricant prevents metal-to-metal contact, removes contaminants, cools machine surfaces, removes wear debris and transfers power.

Broadly speaking, lubricating oils are composed of base oils and additives.

Lubricating base oils are the building blocks of any lubricant.

Base oils are either mineral oils derived from refined crude oil or synthetic base fluids manufactured in a chemical process plant.

Base oils have different physical and chemical properties. This makes it possible for the lubricant- blending chemist to formulate a range of lubricating oils.

Lubricants are made by combining base stocks, selected for specific performance characteristics, with petroleum or synthetic additives which are added to the base oil to improve the chemical and physical properties of the lubricant. The additive content for a finished lubricant can be up to 20 percent. Additives can be added one at a time to achieve a specific performance requirement or to suppress undesirable properties. They can also be added in packaged form which provides the blender with multiple performance capability.

Oilswastes appear at the processes of details washing of trains, treatment their superficially active matters, acids, alkalis. Such wastes are characterized by the variety of compositionand physical and chemical descriptions. For example, slimes contain in the composition the aggregate of mineral matters, which split into the following high-toxic components: connections of lead, cadmium, acids and alkalis. That is why simple incineration of such wastes is inadvisable and dangerous, because it will result in multiplying contamination of environment. For this reason, one of the aims of the articles is the detailed investigation of composition and physical and chemical

descriptions of these wastes, creation of recommendations in relation to introduction of rational technologies of their processing.

A research purpose is a study of basic ways of study technological heavy mineral oils and oils wastes and possibility of their utilization.

Tasks of research are as follows: to consider the basic ecological problems of formation of wastes; to define basic directions and ways for utilization of technological heavy mineral oils and oils wastes.

Reclamation – to treat a charge of lube oil, preferably on-site, and return the charge to the machine sump. An example of this is reclamation of motor oil and compressor oil. Reclamation may take place off- site where the vendor of the reclamation service drains the existing charge and replaces it with previously reclaimed oil. Reclamation generally involves cleaning, drying and perhaps adsorption to remove color, acids and sludge. The reclaiming of a lube oil is essentially a non chemical process that restores lube oil for reuse in a system.

Reclaiming lubricating oil:

• removes environmental liability;
• reduces used oil disposal costs;
• reduces new oil purchases;
• reclamation is a cost-effective process.

Reclaiming oil accomplishes the following:

• conserves a valuable resource;
• prevents contamination of the environment;
• saves money by reducing waste disposal costs;
• reduces long- term liability for disposed products – from beginning to end.

Motor oil and compressor oil lend themselves to being reclaimed but one must ensure that lubricant performance has not been downgraded after reclamation.

Reclamation usually involves the lube oil being filtered and cleaned of debris, sludge and fine particles. Centrifuging also occurs to remove suspended particles and some water.

Great care must be exercised with motor oil and compressor oil when carrying out the reclamation process. Centrifuging and filtration will remove particles and water, but the motor oil and compressor oil must continue to perform its task of cooling, sealing, lubricating and corrosion prevention. Even though the application is critical, motor oil and compressor oil sump volumes warrant the reclamation effort.

Motor oil is reclaimed by a combination of filtration, sweetening with fresh oil and sweetening with additives. The combination results in the removal of fine particles, sludge and water, and regenerating the performance level.

We propose the scheme for the treatment of used motor oil $M14V_2$ (fig. 1) and the scheme for the treatment of used compressor oils KS-19 (fig. 2), which use surface-active substances (neonol, ABSK, emal 270 d).

For improve the quality of the restored motor oil and in particular raising the value of the pH, we suggest after cleaning they will add additive.

Output of refined products by using these schemes is about 85-90% for motor oil and 90-92% for compressor oil.

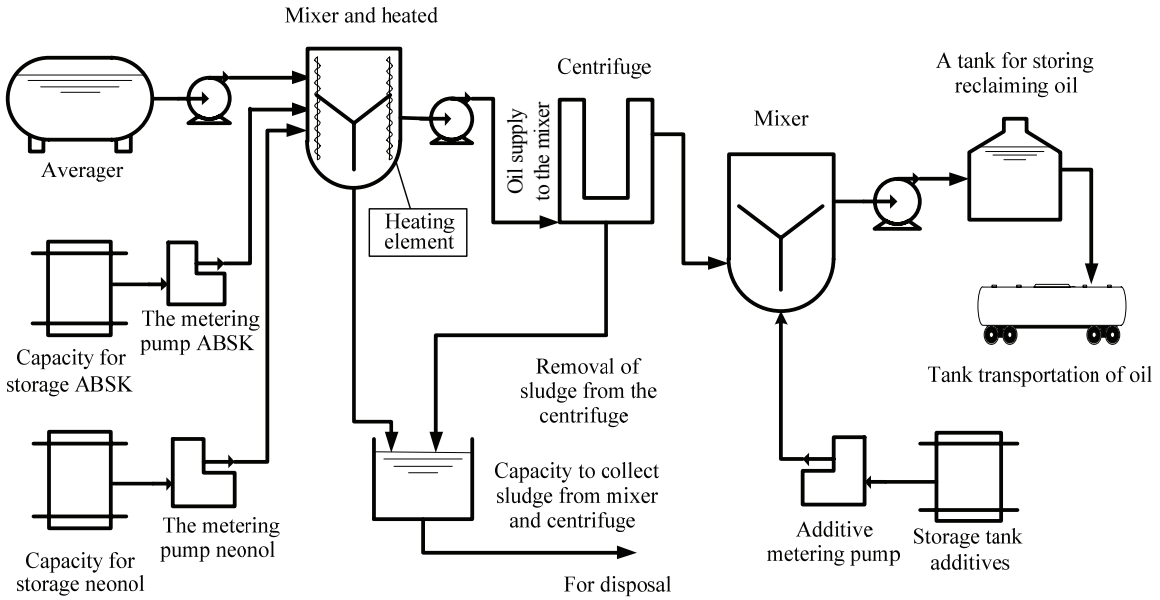

Fig. 1 - The scheme for the treatment of used motor oil

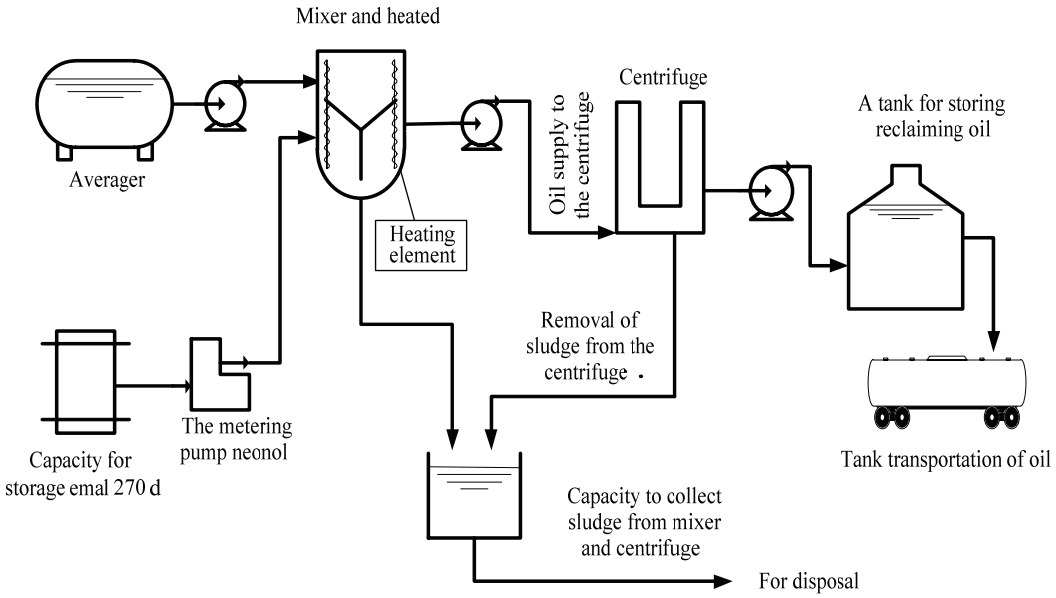

Fig. 2 - The scheme for the treatment of used compressor oil

When lubricating oil reaches the end of its design life, it must be either reclaimed or recycled.

If reclaimed, the lube oil may continue to serve its design function for many more operating hours. Rigorous testing and record- keeping are necessary for this approach. If the waste oil is a mixture of contaminants and spent oils, then the used lube oil can be reprocessed by a contracted recycler who conforms with all government regulations. Every business should keep track of the used oil it generates once it leaves the plant. Plants which generate large volumes of used oil should seek an independent report on the process practiced by their contracted recycler.

UDC 665

N. Zakharchuk, Post-graduated student (National Aviation University, Ukraine),
S. Boichenko, Professor (National Aviation University, Ukraine),
L. Cherniak, PhD in Technical science (National Aviation University, Ukraine),

ENGINE OIL QUALITY TRENDS AND CHALLENGES IN UKRAINE

The article provides analysis of main factors influencing the trends in quality of lubricating oils for passenger cars, including structure of engine park, international standards parameters, and consumer factors. Main challenges for quality of engine oils improvement in Ukraine are defined and solutions for their overcoming are proposed.

Introduction. It is well known, that the life expectancy and performance of any engine are affected not only by the type of the engine itself, quality of the fuel used, but also are strongly influenced by the quality of lubricating oils applied in the engine. Formulations of engine lubricating oils can include a variety of components: mineral base oils, synthetic base oils, and additives. These constituents have various properties, and their combinations result in thousands of different blends manufactured today. All these varieties are produced either to meet specific performance conditions, such as low temperature start and pumping, deposit formation prevention, contaminant collecting, etc., or to compete within specific price range. The second often results in producing lubricants that are sold well but fail to fulfill all of the functions expected.

Several institutions and organizations that set the standards and continuously give recommendations as for the quality parameters of finished lubricants represent another big player in the world of engine oils for passenger cars. These structures often determine classifications for motor oils and license the manufacturing of specific grades and brands. They include American Petroleum Institue (API), European Automobile Manufacturers' Association (ACEA), International Lubricants Standardization and Approval Committee (ILSAC), and Society of Automotive Engineers (SAE). Naturally, these organizations are based in Europe and the USA, where most of automobile manufacturing companies reside. Often, these institutions by issuing the standards for engine oil quality duplicate the values for most of the properties. It is here, where the manufacturer of lubricants must choose what standard to use when blending the oils.

One more player, for whom the quality of engine oil manufactured by the blending company according (or not) to the standards issued by the standardization organizations is represented by final consumers. Does the consumer have any power on quality of engine oils? How can the consumer influence it? Who sets the trends in the market and in the quality of lubricating oils for passenger cars? These questions are complex in their nature, require answers with explanations and are addressed in this paper.

In Ukraine, all these three objects (consumers, manufacturers, standards) create a set of trends and challenges for quality of engine oils. In their turn, these trends and challenges are different for all parties involved and experience different influence of transient and permanent technological, financial and market factors.

This paper describes the factors important for the quality of engine oils for passenger cars, determines the main objects that set the trends and produce challenges for it, analyses characteristics and general ideas for every trend and challenge, as well as gives advice on possible solution of existing problems in the field of motor oils quality in Ukraine.

Transitory and permanent factors influencing engine oil quality in Ukraine. Standardization organizations, manufacturers and consumers share these objective factors, with a role of each being hard to determine. It is so due to the nature of the factors coming from global, national, historic and other types of trends. At the same time, they play a very important role in shaping the market for engine oils and influence their quality.

Factor 1. *Passenger vehicle park structure*. According to reports of Ernst & Young Global Automotive Center and other statistical data from industry reports, the number of passenger cars in

Ukraine per 1000 people is approximately 200. It is about the same as in Russia and almost twice as less as in the United Kingdom or the USA. After seeing a drop in the market of new vehicles during 2008-2010 due to the world economy and finance crisis, a slight increase (about 3 % per year) and stabilization in the growth of the market has been observed in the past two years. Ukrainian passenger vehicle park consists of cars of Russian and foreign brands, with the share of cars from local producers being incompatible. Basically, Russian and Ukrainian brands (LADA, GAZ, Moskvich, ZAZ, UAZ and others) make up about 55 % of all passenger vehicles. The share of 45 % is divided by numerous brands with origin in Europe, Asia, and North America. It is worth to mention, that producers of vehicles from foreign countries face some significant obstacles when competing in Ukrainian automotive market. Additional taxation, unfair business rules, slow authorities response, and unclear regulations together strongly overcome such a factor as low purchasing ability of consumers. Still, the portion of foreign brands in the vehicle park is expected to rise significantly in the following decades resulting in over 50% by 2015

The impact of this factor on the quality of engine oils is evident. Engine oils have to be chosen by an owner of the vehicle based on the recommendations for the specific model. These recommendations, of course, are set by a variety of institutions and the car manufacturers themselves, however it is up to the owner of the vehicle as to whether follow the recommendations, or not. The presence of big share of vehicles older than 5 years in Ukrainian park also cause the late transition to the latest quality trends in engine oil market.

Factor 2. *Fuel Quality*. The market for automotive fuels in Ukraine is somewhat mysterious and very complicated. Most of the passenger cars use gasoline and diesel fuels; however, the number of cars with engines working on CNG and LPG is reaching 100 thousand. Among the six main oil refineries in the country only one is currently operating – Kremenchuk oil refinery. Naturally, is not possible for one plant to satisfy the needs for light petroleum products such as gasoline and diesel fuel. Therefore, additional sources of these oil products must be included. This situation has caused the spread of so called “mini-oil refineries” which very often produce use old equipment, produce straight run fuels and do not optimize their quality to meet the standards. This greatly increases the risk of buying a low-quality fuel by a consumer at the fueling station with fuel quality control system being inefficient and, for the most of the part, inactive in Ukraine.

According to the statistical data, more than a half of all gasoline and diesel fuel is imported from other countries such as Russia, Hungary, Belarus, and Lithuania and so on. Usually, the imported fuel posses somewhat better quality when a local produced one. Hence, several reports have been made that this imported fuel is blended with local straight-run fractions and sold as premium brands at Ukrainian fuel-filling stations.

Another problem concerning fuel quality is created by the state standards that regulate the quality of gasoline (DSTU 4063-2001) and diesel fuel (DSTU 3868-99). These standards are out of date and set poor quality characteristics for the fuels. This allows the manufacturers and importers to sell the fuels with high sulfur content and poor performance characteristics. Usually, these fuels correspond with Euro-2 standard. The mandatory application of more modern standards is not introduced by Ukrainian authorities, which keep on prolonging the current quality standards.

The impact of the fuel quality factor from one point of view should be important for manufacturers, and from the other point of view, for the buyers of engine oil. The blenders need to take into account all lacks of fuels and produce the lubricating oils that would help to withstand low quality fuel usage and provide better engine protection. Consumers, on the other hand, have to pay better attention to the fuels they buy, and, if possible from financial standpoint, purchase the better-quality fuel, which is available in Ukrainian fueling stations.

Factor 3. *Lubricant quality control system*. It is evident, that whenever there is a demand for a product, some parties would want to falsify it and make “quick money” by blending the products and selling it under well-known brands. Many cases of this issue are occasionally reported in the media and other informational sources. The problem with quality here lies in the fact that laws of Ukraine and their enforcement are not efficient and do not give full protection to the rights of producers and consumers. Since this issue is not put forward by anyone, the problem stays active.

A chance of buying a falsified engine oils increases when buyers get their products not from official automotive stores and service stations, but from the cheap market places. And they learn of poor quality of the lubricant only after some time, when it is usually impossible to take any measures against dishonesty of the seller or a producer.

The three factors mentioned above represent only a part of a group of factors influencing the quality of engine oils in Ukrainian market. No doubt, there are many more, however, to the point of view of the authors theses are the most evident and the most important ones.

Engine oil quality trends and challenges by standardization institutions factor. American Petroleum Institue (API), European Automobile Manufacturers' Association (ACEA), International Lubricants Standardization and Approval Committee (ILSAC), and Society of Automotive Engineers (SAE) issue classification for passenger car and other vehicle types engine oils. At the same time, because some European and American original equipment manufacturer (OEMs) car manufacturers have been unsatisfied with the proposed quality parameters, they came up with their own OEM engine oil standards. The latest cannot be directly compared with the API and other standards since involve a different variety of oil performance tests. The most known standards include the ones from Volskwagen Group (VW 500.** and VW 505.**) and Mercedes-Benz (MB 228.** and MB 229.**). Others include standards by General Motors, Peugeout, BMW, etc.

Trend 1. *API quality classification domination*. Most of the markets in the world, including Ukraine, refer to the American Petroleum Institute quality level only when describing the quality of the engine oil manufactured. In fact, it is almost impossible to find a can with motor oil in Ukraine without an API classification specified. It is very often that consumers choose specific oil for their car based on higher API level for the specific viscosity grade.

Challenge 1. *Old standards domination*. Because of insufficient information campaign by the standardization institutions and the age of the vehicle park, the biggest share of engine oils in Ukraine is labeled by the old and inactive API and ACEA standards. For example, a common API SF classification was originally introduced for 1980 gasoline engine warranty maintenance service but still is in use widely among lubricant manufacturers. The out-of-date standard may lead to inadequate purchase by a consumer fooled by an unknown label and, thus, to the poor motor oil performance.

Possible solution to this challenge can be carried out in several ways: by application of newer standards, educational information for an average consumer, governmental stimulation for renewing the vehicle park.

Engine oil quality trends and challenges by manufacturer factor. The manufacturers of finished lubricants directly create the quality of engine oils. They are responsible for following the Institutions' and OEMs' standards, choosing the best ingredients for formulation of efficient lubricant, handling the honest marketing campaign to satisfy the needs and wishes of the buyers.

Some oil blending companies may abuse the rights and produce, for example, oils of "fighting grade." Such lubricants usually meet only some critical specifications and are not completely manufactured in accordance with the standards. The "premium grade" engine oils are formulated to pass all the specifications easily. Often, the well-known brands may produce both types, so it is up to the consumer to learn the difference.

Trend 2. *Fighting grades and low quality manufacturing*. In Ukraine, many domestic producers put a number of ACEA, API and OEM classification labels without the proper testing and official certificates from these organizations. It is quite questionable, that for every brand and grade all the necessary tests are carried out. For example, in order to prove that engine oil corresponds with API SL level, it is suggested for the oil to pass ASTM ball rust test, Sequence VE, VG, and other important tests. For many of these, there are no possibilities even in Ukrainian certification centers to be tested. What usually happens instead is that a manufacturers labels API classification simply by matching several characteristics with an API standard.

Challenge 2. *Producing high-quality engine oils*. In modern conditions with more than 200 brands available, the main competition factor in engine oil market is price of the oil. In the fight for sales numbers, manufacturers begin to manipulate the formulation with choosing cheaper

ingredients and alternative raw material sources. This, in turn, decreases the quality of the finished products and the consumer is the one to pay the price for it eventually.

This challenge would be possible to eliminate with application of stricter quality control system by the authorities, stimulation of the import of the necessary raw materials for the production of quality oils, and increasing awareness of the consumer fighting "the cheaper, the better" ideology.

Engine oil quality trends and challenges by consumer factor. The consumers experience the most significant impact of quality of motor oils. The owners of passenger cars use different principles when purchasing oils for their vehicles. However, eventually, it is only they who suffer from the poor quality.

Trend 3. *Switching to the better quality engine oils*. Over the years, the vehicle park evolves toward the substitution of older cars with the new models that require better care and better quality of lubricants. At the same time, the increase in purchasing ability of consumers causes restructuring of engine oil market toward more efficient grades which can be proved by domination of SAE 10WX semi-synthetic oils and increasing a share of synthetic-based motor oils in sales.

Challenge 3. *Buying better performance oils*. Due to enormous variety of brands introduced into the market, a consumer might fall for tricky marketing purchasing a low quality product at a price of high-quality one. It is not only the brand name, which is important this time.

To solve the challenge, the manufacturers who implement "smart marketing" strategies and the printed and digital media covering the automotive topics should emphasize the attention to modern standards, as well as information on critical engine oil parameters and their influence on performance of the engine.

Conclusions

1. Several factors influencing engine oil quality in Ukraine have been identified and described. They include: passenger vehicle park structure, fuel quality, and lubricant quality control system.
2. The main engine oil quality trends have been distinguished as the following: API quality classification domination, fighting grades and low quality manufacturing, switching to the better quality engine oils by consumers.
3. The challenges for improvement of engine oil quality in Ukraine include old standards domination, producing high-quality engine oils, buying better performance oils. The possible solutions to deal with these challenges have been advised.

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O. Stelmakh, PhD in Technical Sciences,
Al-Tamimi R.K., post-graduated student
Hussein D.J., post-graduated student
Ibraimov A.T. post-graduated student (National Aviation University, Ukraine)

EXPERIMENTAL COMPARISON OF DIFFERENTIAL-PHASE METHOD AND METHOD OF DYNAMIC FOCUSING IN DEFINING OF ROUGHNESS PARAMETERS OF SURFACES

In this work you can find information about differential-phase method and method of autofocusing, which are used on differential-phase laser scanning profilograph-profilometer (DFLSPP) and microscope «MICROSCAN» correspondently. Also is considered experimental comparison of defining of 3D micro- and nano-geometrical surface conditions and standardized roughness parameters of surface with the help of those methods.

Almost all modern machines and mechanisms consist of friction nodes, which realize contact interaction of details with working surfaces in relative motion between each other. From tribology of boundary greasing it is known that there is great influence of surface roughness on tribological properties of rolling or sliding tribosystems. Due to this fact during production of details different quantitative methods for determination of roughness parameters are widely used (such as profilograph-profilometer CALIBR-201, "TEYLOR HOBSON", "SURTRONIC-10". Contac methods allow describing micro-geometrical surface structure only according to single profiles and they can't give information about volumetric surface condition, which is very important during friction in dependence of direction of exploitation and influence on wear resistance of tribosystem.

Nowadays contactless optical methods and equipment such as laser contactless differential-phase method and method of dynamic focusing (in DFLSPP of Ukrainian production [2] and microscope "*μscan*" of German production correspondently) are used instead of contact, less informative and destroying methods. This new equipment and methods can give essentially new, qualitative and quantitative information about volumetric 3D micro- and nanometric geometrical surface condition. In this work are presented results of experimental investigations of rough surfaces done with a help of DFLSPP and *μscan*.

Today for controlling of working surface roughness of details with friction nodes contact methods still are used. In contact method needle with a circular diameter 2…4 mkm slides on a surface of sample in a linear direction. This method can be used for determination of wear traces after tribotechnical tests.

After experiments done on friction machine with a constant linear contact radial deviations are more then 1 micrometer, axial- 0,1 micrometer. That is why we can say that one of the main factors, which influence on results of tribological experiments of lubricating materials, is external structure of working surface of samples after friction.

But usage of contact method can provide us with necessary information about structure of surface, and can't give full information about surface, such as roughness in a direction of sliding. This information have influence on character and value of wear [1].

Moreover, equipment which is based on contact method can scan surface only in one linear direction. In such conditions it is very hard to make volumetric estimation of surface structure. Indentor (needle) which is used for estimation of friction surface have circular radius (approximately 2 micrometers). That is connected with technological features and design of equipment and sensitive elements, which realize this contact method. Because of that we have such consequences like that hardware can't fix geometrical character of surface if it has roughness less than diameter of needle. That is why only contactless optical method can provide us with full information about 3D volumetric surface structure.

DFLSPP of Ukrainian production was created for reception of true information about surface structure and reception of differential-phase picture. Principle of action of this equipment is based

on acoustic-optical scanning of object with the help of laser beam, which is divided in two orthogonal directions in crystal of parateluryte. During scanning this beams are reflected from surface creating 3D differential-phase picture (fig. 1).

For investigation of phase changing from reflected light waves in surrounding is used differential-phase method. This method allows creating optical scheme tolerant to vibrations.

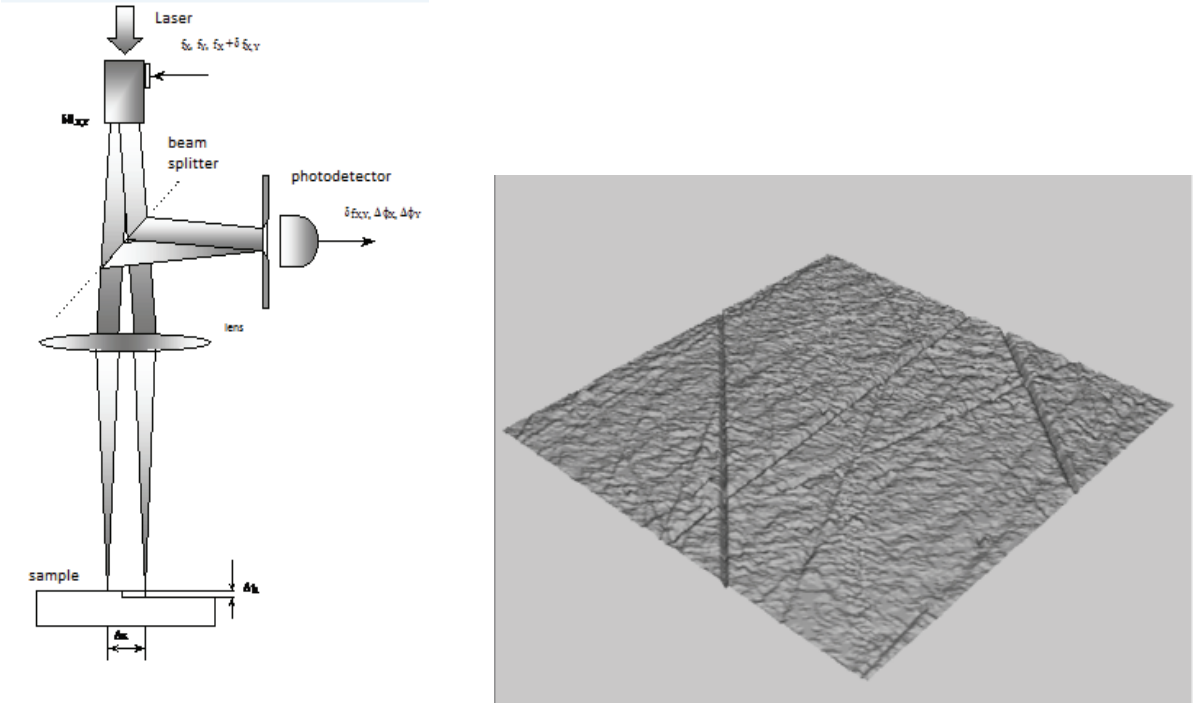


Fig.1. Laser contactless differential-phase method

Method is based on reception information about local difference of phases of two beams (basic and alarm), from which we can receive information about local curvature of wave front surface by scanning and integrating of defined values [3].

METHOD OF DYNAMIC FOCUSING Microscope µscan of German production by firm NanoFocus [4] was created for the same purposes as DFLSPP. But principle of action of this microscope is not the same. It has focusing sensor and movable lens, which provide auto-focusing by moving of lens along measurement scale (fig.2).

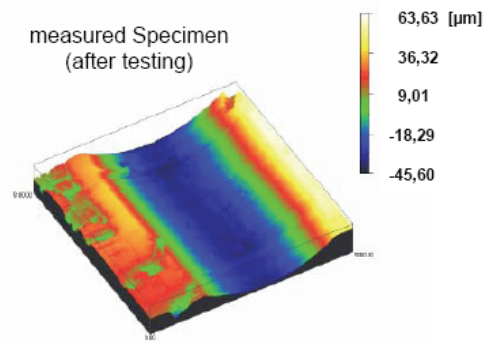


Fig. 2. Method of dynamic focusing method

Investigated object moves under laser beam with the set speed and information about moving of movable lens in dependence of height of surface relief goes to computer. The more focused points we will have the better picture will be received. The maximal investigated area is 10x10 cm^2.

EXPERIMENTAL DEFINITION OF POSSIBILIES OF DFLSPP AND “MICROSCAN”

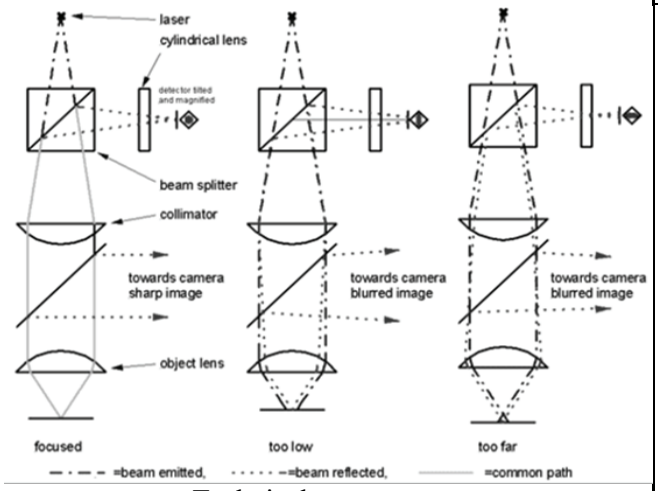
Important peculiarity of DFLSPP and microscope µscan is possibility to define and calculate volumetric structure of rough surfaces. Software of that equipment allows defining main roughness parameters of investigated surfaces of samples. Both microscopes have different methods of

calculation, that is why they also have different technical characteristics. Thus on DFLSPP can be calculated standardized roughness parameters of samples in a range 0,005…0,320 micrometers and on µscan in a range 0,025…1250 micrometers (Table1). But on microscope µscan this calculated roughness parameters are also compared with international standards ISO, which can be chosen for different materials. Also it has to be mentioned, that very important parameter during investigations of the sample is its reflection ability. For DFLSPP can be also investigated objects with reflection ability less then 50%, bun in this case lenses on profilograph-profilometer should be changed.

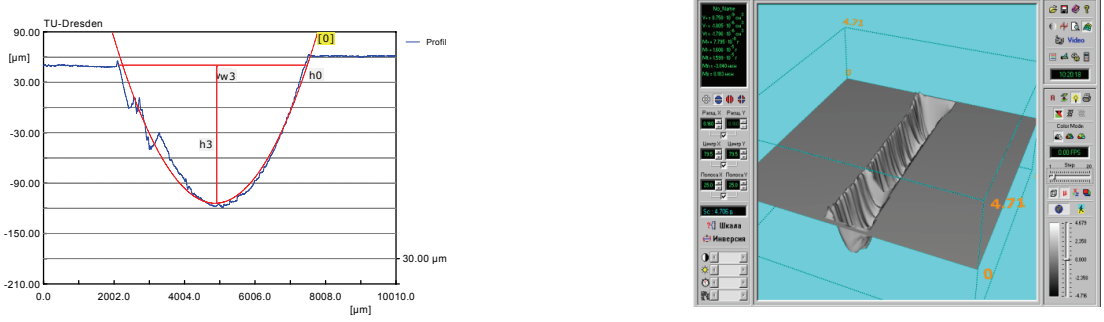
Table 1.

Technical characteristic of microscopes

№	Technical parameters	Microscope			
		DFLSPP		µscan	
		Type of objective lens			
		PLAN, F=6,3, A=0,65	PLAN, F=16, A=0,3	autofocus	
				AF2	AF5
1	Max.scanning area, mm	2,5×2,5 0,8×0,8	5×5 3×3	100×100	
2	X, Y- resolution, mcm	0,8	0,6	1	1
3	Curvature of surface, degree/mcm	20	8	26	19
4	Reflection coefficient of the surface, %	≥50		0…100	
5	Height of measured step of relief, mcm	≤0,32		≤1500	
6	Resolution for relief, nm	≤10		≥25	
7	Type of scanning	Acousto-optical		mechanical	



Microscopes Nanofokus and LDFSPP are used for definition size of deterioration of modeling bearings of sliding after friction in laboratory conditions. In the fig. 3 are presented profile of trek after friction, received on a microscope Nanofokus in the laboratories of the Tribotechnics of ILK TU Dresden and 3D image of a trek after friction received on LDFSPP in laboratories Nanotribotehnology NAU Kiev.



a) b)

Fig. 3. Profile of trek after friction by NANOFOCUS (a) and 3D view of trek after friction by LDFSPP (b)

Conclusion

Choosing equipment for estimation roughness parameters consumer need technical and economical comparison of this equipment to decide which one is better for purchase. Comparison of technical abilities had shown that differential-phase method has next advantages:

- Is insensitive to vibrations;
- Microscope can provide measurements of surface parameters to 1 nm on height of relief;
- Investigated object is immovable;
- Object with any size can be investigated.

But in this method we don't have autofocus and have not so big working range (height of relief can be measured in range 1…320 nm). Disadvantages of differential-phase method are realized in method of autofocus. And we can name its advantages:

- Wide measurement range;
- Autofocus;
- Sample with surface with any reflection coefficient can be investigated.

In method of dynamic focusing we have next disadvantages:

- Sensitivity on height of relief is smaller then in DFLSPP;
- Mechanical scanning, which lead to vibrations and decrease sensitivity of microscope.

Comparison of all this advantages and disadvantages, general technical characteristics and price of this equipment show that such investigations are very important for consumers for making of an optimal choice of microscope for work in definite conditions.

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UDC 621.43.019

A. Pushak (PALTEH, Ukraine),
D. Rinda (Innospec Fuel Specialties, Russia),
U. Plattes (Innospec Fuel Specialties, Germany)

INNOSPEC FUEL SPECIALTIES. COMPANY ACTIVITY OVERVIEW

The modern types of fuels additives. In this work you can find information about chemical products for special purposes.

These data describe a rapidly growing international company that manufactures specialty chemical products. «INNOSPEC» is one of the world's leading producers of oil additives that supplies more than 200 refineries in 65 countries.Our products help manufacturers to meet fuel requirements of the certain specification and to achieve maximum results. A team of specialists of the «INNOSPEC» company consists of engineers, technicians and managers and provides counsulting, conducts training and assists in all areas of processing. In addition, working closely with the refineries, the company is doing everything possible to help meet the requirements of the fuel specifications with minimal expenses.

We pay special attention to the technology of fuels and fuel additives. We develop and market products that help:

- improve the cleanliness, efficiency and safety;
- reduce emissions and operating costs of the engines, boilers and gas turbines;
- we enhance the quality of any petroleum-based fuel, coal or biofuels;
- we have undertaken to increase production to 10% per year – faster than the expansion of the market;

Division of Fuel Specialties - segments:

1. fuel catalysts;
2. specialized chemical products for refineries;
3. chemical products for special purposes;
4. specialized chemical products for the marine fuels;
5. specialized chemical products for power plants;
6. specialty chemicals for heating systems.

Fuel Specialties – a variety of proposed technologies:

7. antioxidants and metal deactivators;
8. corrosion inhibitors;
9. dyes and markers;
10. additives that improve lubricity;
11. additives that increase the cetane number;
12. stabilizers for petroleum fuels;
13. detergent additive packages for gasoline;
14. detergent additive packages for diesel fuel;
15. additives, which improve cold flow;
16. additive which increases octane number;
17. additives that improve combustion of diesel / fuel oil;
18. additives, which reduce hydraulic losses in the pipeline;
19. additives for alternative gasoline;
20. additives for alternative diesel fuels;
21. biocides;
22. odorants.

Fuel Specialties – Technology assortment of 2:

23. additives for light fuel oil;
24. additives that remove static electricity;

25. additives for aviation fuels;
26. additives for heating oil;
27. additives for marine fuels;
28. asphaltene dispersants;
29. additives that improve combustion of heavy fuel oil;
30. additives that recover diesel particulate filter;
31. anti-knock additives for gasoline;
32. additives that reduce valve seat recession;
33. BioStable ™, BioWinterFlow ™;
34. depressant (PPD);
35. scavenger of hydrogen sulfide (H2S).

Brief information about company

Innospec Inc. listed on NASDAQ (NASDAQ: IOSP) has approximately 1,000 employees in 23 countries. It revenues in 2011 were about 774.4 million dollars. We pay special attention to the technology of fuels and fuel additives. We develop and market products that help to improve the cleanliness, efficiency and safety of fuels, to reduce emissions and operating costs of the engines, boilers and gas turbines We enhance the quality of any petroleum-based fuels, coal or biofuels.

Innospec Limited – Net sales in 2011.

Fuel catalysts

Diesel Particulate Filters (DPF) provide a reduction of particulate matter emissions in exhaust gases of diesel vehicle by 95%. Current legislation in numerous countries around the world and environmental concerns require the presence of DPF. After installing the DPF in the car, the rapid clogging of trapped soot particles takes place that cause operational problems. Innospec has developed a unique new series of additives for diesel fuel, which introduced into the fuel without causing harm, "burn" the soot trapped in the DPF (regeneration). Currently Innospec sells this technology to the number of countries, where it is believed that DPF has played a significant role in protecting the environment.

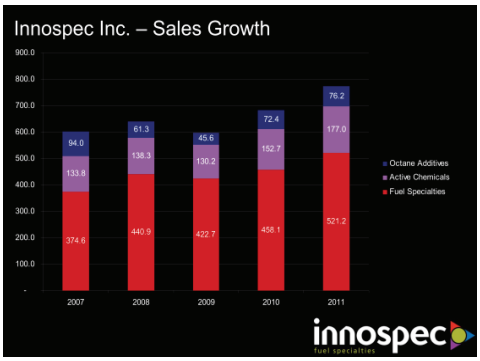

Fig.1 Specialty chemicals for oil refineries (refinery)

Refinery Specialties Division produces a wide series of fuel additives that provide cost-beneficial way to ensure compliance with fuel standards and optimize the output of "premium" class fuels to oil refineries, and sells a range of products and provides services for companies engaged in the production and sale of fuels worldwide. Customers (refineries) of Innospec have several advantages, namely:

36. flexible process;
37. proven, tested and passed the certification products;
38. objects for comprehensive testing;
39. developed international marketing network;
40. product development and maintenance of the leading companies in the industry;
41. long-term cooperation with customers (refineries);
42. independence of provider.

Chemical products for special purposes

Performance Specialties Division has developed a series of packets of additives to improve the operational parameters of gasoline and diesel fuel. Special expertise enables to develop multi-functional additive packages that meet customer requirements for fuel quality and operating parameters, the relevant requirements of the market. Innospec has become one of the leading suppliers of additives to petroleum products, delivering them to more than 200 refineries in 65 countries.

Chemical products for special purposes

1) Detergents (diesel fuel). Innospec additive packages for diesel fuel designed to meet the special requirements of fuel supplying companies. The composition of additive packages generally include: antifoaming additive, additive that improves combustion, cetane improving additive, corrosion inhibitor and additive to eliminate the "water" haze. Series of products Octimise ™ D3000 and the latest development POWERGARD series provides the best operating parameters in the class. While diesel exhaust gases are a subject of great interest on a global scale, products Octimise ™ D3000 and especially POWERGARD significantly decrease engine emissions. In addition, they reduce the noise of diesel engines and fuel consumption, which is perhaps the most important factor for both end user and the environment.

2) Detergents (gasoline). Innospec additive to gasoline are designed to minimize the sediment, resulting from the use of fuel and to provide stable performance and reliability, as well as optimal combustion, for maximum fuel economy and minimal emissions. All the additives and other components are tested in the absence of undesirable side effects providing the required performance. The latest series of products Octimise ™ G2000 provide the best operating parameters in the class. These products provide not only clean fuel system, but also clean the already polluted system, dissolving and removing hard deposits. In fact, these products reduce engine emissions and optimize fuel consumption.

3) Additives that improve the conductivity of fuel. Additives that improve the conductivity of fuel, help to reduce electrostatics arising during transporting, mixing and pumping of fuel. High flow rate and fine filtration of the fuel increase the electrostatic charge of fuel. Additives improving the electrical conductivity of the fuel contributed to the rapid conclusion of this fuel charge. Adding fuel to the product series Stadis ® significantly increases conductivity and reduces the likelihood of sparks and electrostatic discharge. Seed companies «INNOSPEC» Stadis ® 450 and 425 Stadis ® to improve the electrical conductivity of the fuel significantly reduces the risk at the lowest dosage. The use of additives Stadis ® 450 is obligatory for the international aviation fuel as a civil and military purposes, including international aviation fuel Jet A-1, and the Russian aviation fuel PT.

4) Specialized chemical products for the marine fuels. In addition to expert data in scientific-research field, improvement of products, systems, dispensing and distribution of additives, we also provide technical support and high level of service that is supported by a single supply chain and international network of sales offices. Our comprehensive product range includes additives Octamar ™, to improve the following issues:

- before the fuel combustion – dispersants/fuel stabilizers;
- fuel combustion - combustion catalysts;
- after the burning of fuel - ash modifiers / inhibitors;
- demulsifiers - dewatering of sludge;
- tern tube seals.

Additives Octamar ™, used before the combustion may solve the number of problems, such as: the sludge in fuel tanks, clogged fuel heaters, a large load on the separator, removal of abrasive particles, sticking fuel pump and filter clogging, low operating performance fuel injectors.

Application of our additives are used to fuel combustion may solve the number of problems, such as: improve the stability of fuel, improve the compatibility of the fuel, positive cleaning effect with respect to organic materials.

Additives Octamar ™ for the combustion of fuel may improve the following parameters:

smoke, formation of carbon deposits on piston rings, formation of carbon deposits in the turbocharger, low pressure air purge, deposit formation in recovery boilers, dires in recovery boilers. Use of our additives for fuel combustion allows completing the process of combustion quickly and extending fuel burn-up. And therefore reduces the amount of unburned carbon soot, ensures the purity of lubricating oil, resulting in the engine is less susceptible to wear, significantly improves the purity of the economizer and reduces the impact of the unburned carbon soot on the environment.

Additives Octamar ™, used after the burning process may solve such problems as: high-temperature corrosion, low-temperature corrosion, disclaimer exhaust valve, reduced efficiency of turbochargers, deposit formation in the economizer, emissions from the chimney.

Application of our additives are used after the burning process may increase the melting point of vanadium (*V*), reduce formation of ash contamination on the turbocharger exhaust valves due to the action of magnesium modifier ash, when using the catalysts of combustion economizers remain clean for a longer period, neutralization of the acids.

5) Specialized chemical products for power plants. Octapower has more than 50 years experience in the optimization process boiler fuel for the fuel and energy complex, regardless of the type of business, the life of the enterprise or the quality of fuel used. We have human resources, knowledge and technical base for the development of new chemical products and highly complex products. We also have skills in the use of technological systems for a wide range of complex issues. Our range of products Octapower ™ includes: stabilizers and dispersants, combustion catalysts, corrosion inhibitors, additives for gas turbines, specialty additives.

Conclusion

The main advantages of dispersants and stabilizers Octapower ™ use are:

- increased stability of fuel;
- ensured stability of fuel blends to lower temperatures;
- optimized combustion and fuel atomization;
- reduced deposits and sludge in the boiler;
- reduced volume of flue gas emissions

The main advantages of combustion catalysts **Octapower ™**using are:

- reduced formation of soot and particulate matter from fuel gases;
- decreased harmful carbon emissions;
- improved efficiency through better carbon burnout;
- decreased degree of conversion of SO2 to SO3 due to better combustion due to less access to air;
- reduced the amount of NOx as a side effect of smaller air access.

Specialty chemicals for boiler plants are used in central heating systems, water heating systems, individual furnaces. Specialty Multifunctional additive packages ofchemicals for boiler plants include, combustion catalyst, antioxidants, metal deactivators, detergents/dispersant, corrosion inhibitors, additives that improve lubricity, biocides, bacteria, yeasts and fungi, additives-cold flow improvers.

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Pushak A. F. PALTEH, Ukraine
Rinda.D.Innospec Fuel Specialties, Russia
Plattes U.Innospec Fuel Specialties, Germany

ADDITIVES TO ALTERNATIVE RENEWABLE FUELS

The modern types of additives to alternative renewable fuel. In this work you can find information about Chemical products for special purposes.

Generally nonrenewable fuels are made of gas, oil and coal. All the kinds of "biofuels" are derivatives of plants that had dies millions years ago.

Renewable fuels are fuels produced from plants, which resources may be easily renewed after the new harvest. They are fuels made of plant biomass:

- Plant oils;
- Hydroprocessed plant oils;
- Ethers of plant oils;
- Alcohols;
- Ethers of alcohols.

A significant problem connected with application of oils as fuels is their oxidation (racidification). Racidification is a process of oils disintegration (hydrolysis and/or oxidation). Oils are broken up to fatty acids and glycerine during the hydrolysis. After that free fatty acids are subjected to further self-oxidation. Mainly unsaturated fats are oxidized under the influence of free radicals. In racidified oils this process promotes formation of molecules with high reactive ability.

Oils and their chemical composition

Plant oils present a three-component systems on the base of fatty acids. They can be either homogeneous or heterogeneous. Fatty acids can be saturated, mono-unsaturated or poly-unsaturated. The higher level of saturation, the higher stability and the worse low-temperature characteristics are observed.

Fatty acids methyl ethers (FAME)

Similarly to fatty acids they can be saturated, mono-unsaturated or poly-unsaturated. And also higher level of saturation causes higher stability and worse low-temperature characteristics are observed.

Oxidation (racidification) of fats

The process of fats racidification can be presented as following: unsaturation of fatty acids >>> absence of hydrogen >>> free radicals >>> peroxide radicals of fatty acids >>> peroxides of fatty acids >>> hydroperoxides >>> aldehydes, ketons. This process can be interrupted by application of antioxidant that transforms the initial free radical back into fatty acid, playing as a "donor" of hydrogen.

There are also some other properties of oxidation process. For example, the process of oxidation is catalyzed by traces of metals.

This process is prevented by application of metals deactivators. To improve the impact on various chemical compositions of fatty acids, application of different chemical composition antioxidants is necessary. The developed antioxidant that possesses balanced chemical composition provides more range of protection.

Table 1.

Comparative saturation of various plant oils

Plant oil	Saturated g/100g	Mono-unsaturated g/100g	Poly-unsaturated g/100g
Coconut oil	85.2	6.6	1.7
Palm oil	45.3	41.6	8.3
Pork fat	40.8	43.8	9.6
Rape oil	5.3	64.3	24.8
Soy oil	14.5	23.2	56.5
Sunflower oil	11.9	20.2	63.0

FAME standards for Biodiesel. The European Union standard for biodiesel is EN 14214. The analogous standard in the USA and Canada is ASTM D6751. These standards provide execution of all important requirements during biodiesel production. Among them are:

1. Irreversible reaction;
2. Extraction of glycerine;
3. Extraction of catalyst;
4. Extraction of alcohol;
5. Absence of free fatty acids;
6. Low sulfur content.

Low-temperature characteristics. Conventional diesel is a quit complicated compound. Each component has its own chilling temperature. Solidification of the liquid seems to be a stage-by-stage process. However, biodiesel B100 is a much more simple mixture that consists of the limited number of components. Usually one of two components are dominating. Thus solidification comes rather earlier. Temperature range, when pure biodiesel (B100) turns into gel, is quit wide, depending on the ethers mixture and certainly oil used for its production. For example, ericic acid of the rape methyl ether turns into gel at 10^{o}C, but biodiesel made of animal fat solidifies at $+16^{o}$C. There is a small number of products that may lower the temperature of biodiels B100 transformation into gel.

Table 2.

Additives that improve quality of biodiesel FAME

Product	Producer	Application	Biotype
BioStable 403E	Innospec	antioxidant	RME
Stadis425	Innospec	Electric conductivity	RME
CI-0801	Innospec	Cetane number increasing additive	RME
OFI 1010	Innospec	Depressing additive	RME

Table 3.

Cetane number

Facts	Myths
Most of FAME B100 products posess high natural cetane number	Mixing characteristics are linear, that's why it is easy to prognose increase of cetane number during mixing
	Positive impact of Bx mixing always promotes increase of cetane number
	The higher perentage of B100 in a mixture, the higher cetane number will be

Application of Innospec Company additives for cetane number increase may show the following results:

- Some fuels are observed to increase cetane number during mixing:
- Some other – no effect;
- Reaction of cetane number depends on the B100 component and quality of mineral diesel;
- Cetane number change after mixing with B100 component is unpredictable and unreliable;
- Impact of CI-0801additive that increases cetane number is predictable and reliable.

Table 4.

Electric conductivity

Facts	Myths
Most of FAME B100 products posess high natural electric conductivity	Mixing of Bx leads to significant positive impact on electric conductivity
	Mixing with Bx fuel doesn't require application of additives that improve electric conductivity
	The most mixing characteristic is linear, that is why it is easy to predict increase of electric conductivity

Application of Innospec Company additives for electric conductivity increase may show the following results:

7. Electric conductivity is a question of safety;
8. Electrostatic ignition prevention is of high importance;
9. Stadis® additive that improves electric conductivity of fuel is effective and reliable for application in Bx fuel mixtures;
10. Standard B100 is characterized by high electric conductivity;
11. Electric conductivity of B20 mixtures and higher requires verification;
12. B20 mixtures and lower requires application of Stadis® additive.

Content of ethanol in gasoline – problem questions of the USA's government

Lower fuel economy is observed during ethanol application. Transport means usually consume 40% more E85 than conventional mineral gasoline at the same conditions. Mostly, ethanol is more expensive than gasoline independently on the existed reduced payments. When in high concentrations, ethanol causes corrosion of resins, steel, aluminum. So it is necessary to modify all the fuel system of the vehicle. Publication #960501 (2005) of the Association for renewable energy sources also notices that: "some of the mentioned additives may promote regulation of pHe. Necessary information you may get from the producers". More than 80% of ethanol used in the USA for Gasohol production contain DCI-11 additive that provides correspondence of Gasohol end product to requirements of automotive industry.

Ethyltretbuthylether (ETBE). Ethyltretbuthylether (ETBE) is usually applied as a mixing component for fuel saturation with oxygen. During the process of ETBE synthesis the mixing of ethanol and isobutylene takes place and further heating at the presence of catalyst. ETBE as well as ethanol (or even more) is safe to natural environment. At the same time it is much easier for production.

Table 5.

Additives to alcohols and alcohol containing fuels

Product	Application	Biotype
BioStableä DCI-11	Stabilizer, corrosion inhibitor	Ethanol
BioStableä E85 G-Plus	Stabilizer, corrosion inhibitor, lubricating additive	Ethanol, ETBE
BioStableä 322	Stabilizer	ETBE

Conclusion

BioStableä E85 G-Plus is a polyfunctional fuel additive on the base of ethanol E85 for application in engines constructed for E85 as an alternative to gasoline. Additive formula contains lubricating additive, corrosion inhibitor, pHe stabilizer and some other additives. BioStableä E85 G-Plus is an additive specially developed to solve problems of fuel with high ethanol component: lubricating ability, pHe stability, corrosion.

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A. Yakovleva , Post-graduated student,
O. Vovk, PhD in Technical Sciences
S. Boichenko, Professor
(National Aviation University, Ukraine)

INVESTIGATION OF THE FRACTIONAL COMPOSITION OF RAPE OIL-DERIVED AVIATION BIOFUELS

The article outlines modern perspectives of transition from conventional to alternative aviation fuels. The present ecological situation determined by the activity of aviation industry is presented. There is a short review of the world experience in use of alternative aviation fuels, the most widely used technologies and raw material for its production. The results of investigations of the fractional composition of rape oil-derived aviation biofuels.

Modern civil aviation is developing constantly. For today, there are about 2 thousand airlines that have more than 50 thousand aircrafts all over the world. The volume of passenger aviation operations increases on 4-5% annually. Within the previous ten years the level of fuel consumption for air-feed jet engines increased by 21%. At the same time crude oil as well as other fossil fuels used for aviation fuel production are exhausting. Oil deposits are estimated for 40 years, natural gas – 70 and coal – 230 years. Such situation causes constant growth of prices for crude oil, natural gas and coal, thus consequent increase of aviation turbine fuels cost.

Except that, there is a complex of ecological problems connected with the use of traditional aviation fuel. Civil aviation is responsible for production of about 2% from global CO_2 emissions. Aircrafts' exhausted gases contain other harmful substances that negatively influence both environment and human health: SO_x, NO_x, CO, CH_4, soot, unburned hydrocarbons, etc.

The majority of modern fuels for gas-turbine engines are obtained in a result of crude oil processing. At the same time some countries produce jet fuels from such non-oil raw material as coal, natural gas, oil shale and oil sands. It is stipulated mainly by the availability of certain resources at the territory of producing country.

However, taking into account modern ecological situation and limitation of available raw materials, development and application of aviation alternative biofuels become more popular day by day. These biofuels includes fuels derived synthetically from biomass via the FT process, derived from renewable oils (biodiesel, biokerosene, hydroprocessed renewable jet – HRJ or hydrotreated vegetable oil – HVO).

Considering the outlined questions modern fuels for gas-turbine engines should satisfy the number of requirements, connected with efficiency, reliability, long lifespan of the aviation technique and ecological safety. Among them are:

- High level of evaporation;
- Good low-temperature properties;
- Chemical and thermal stability;
- Absence of negative impact on metal and non-metal details of the engine fuel system;
- Good lubricating properties;
- Optimal level of electrical conductivity;
- Absence of toxic components, additives and admixtures;
- Minimal content of sulfuric compounds that lead to formation of harmful and toxic exhaust gases.

Our investigation is intended for development of biokerosene for jet engines. The biokerosene belongs to the first-generation alternative fuels. It presents a mixture of traditional kerosene and biocomponent in different proportions. The content of biocomponent may reach up to 50%. Biocomponent is a methyl or ethyl ether of fatty acids (FAME/FAEE) that are contained in vegetable oils. Technology of this biocomponent production is quit simple and it is similar to production of biodiesel. Its essence is the process of chemical conversion: fatty acids of vegetable oils are esterified with presence of methanol or ethanol and base catalyst with further formation of ethers and glycerine.

Various oily plants can be used as a feedstock for biocomponent production. Taking into account Ukrainian climatic conditions and peculiarities of agricultural industry the most appropriate raw material for biokerosene production is sunflower, rape and soy. During our investigation we have analyzed physical-chemical properties of biokerosene that contains rape oil derived biocomponent.

One of the basic parameters that determines properties of aviation fuel is fractional composition. This parameter characterizes content of fractions that boils at different temperature ranges. Traditional jet fuel derived from crude oil is a middle-distillated kerosene fractions with boiling temperature range from 150 to 320 ^{o}C It is presented in percent (by volume) at atmospheric pressure and constant speed of temperature increase. Fractional composition of jet fuel influences on the following indexes: evaporation discharge, fire safety, starting capability, combustion efficiency, absence of smoking and soot formation. Such indexes as start boiling temperature and 10% by volume recovered temperature describe fuel evaporability, fire safety, ignition properties and appearance of cavitation processes. The lower these temperatures the higher probability of fuel system disturbances appearance and higher losses of fuel from evaporation are observed. Temperature of 50% by volume recovered determines evaporability of fuel middle distillates and stability of the fuel. Temperatures of 90% and 98% by volume recovered characterize presence of high-molecule hydrocarbons in fuel. The higher these temperatures, the harder it will be reached completeness of fuel combustion, absence of smoking and soot formation.

During the experiments we have analyzed fractional composition of biokerosene mixtures with two kinds of biocomponent: rape oil FAEE and rape oil FAEE additionally purified. The following samples were investigated: pure mineral kerosene (type “TC-1”), pure biocomponent and mixtures containing 10%, 30% and 50% of biocomponent. All the data obtained were estimated according to the Industrial Standard of Ukraine ГСТУ 320.00149943.011-99 Fuel TC-1 for turbine jet engines. Technical conditions (tables 1, 2).

Table 1.

Fractional composition of biokerosene containing rape oil FAEE

Distillation temperature index, ^{o}C	Fuel TC-1 (100%)	Rape oil FAEE (100%)	Mixture of TC-1and rape oil FAEE in proportions:			ГСТУ 320.00149943.011
			(90%:10%)	(70%:30%)	(50%:50%)	
Start boiling point, max	153	77,5	77	75,5	76,8	Reported
10% recovered, max	168	320	167	175	173	175
50% recovered, max	192	336	195,5	207	238	225
90% recovered, max	224	340	263,5	-	-	270
Final boiling point, max	245	340	264	347	353	280
Volume recovered, %	98%	90%	92%	89%	82%	Not normed

Table 2.

Fractional composition of biokerosene containing rape oil FAEE (additionally purified)

Distillation temperature index, C^{0}	Fuel TC-1 (100%)	Rape oil FAEE purified (100%)	Mixture of TC-1and rape oil FAEE purified in proportions:			ГСТУ 320.00149943.011
			(90%:10%)	(70%:30%)	(50%:50%)	
Start boiling point, max	153	765	75	76	76	Reported
10% recovered, max	168	336	169	173	173	175
50% recovered, max	192	345	194,5	207,5	261,5	225
90% recovered, max	224	-	268	361	-	270
Final boiling point, max	245	320	278	365	368	280
Volume recovered, %	98%	82%	91%	99%	88%	Not normed

Data presented in tables show that both biocomponents have fractional composition that is not

appropriate to traditional kerosene made of crude oil. Such boiling temperatures of FAEE are rather typical for diesel fuel that has quit higher range of boiling temperature. Visually the process of biokerosene distillation looks unstable and quit vigorous. However, during experiments we have registered unusually low start boiling temperature of the biocomponent and mixtures (75-77 ^{o}C). It may speak about the presence of alcohol (ethanol) that is residual from the process of biocomponent production. It must be noticed, that samples with additionally purified biocomponent have significantly lower content of alcohol fraction.

Data in tables show that only mixtures with 10% content of biocomponent are appropriate for jet engine use. Mixtures with 30% and 50% content of biocomponent have to high boiling temperatures of 50% and 90% recovered. In general, boiling process of samples with additionally purified biocomponent looks more stable and more similar to mineral kerosene. We may predict that purification of biocomponent have positive influence on the fractional composition of biokerosene and its properties. However, the obtained results have shown that biocomponent requires deeper purification in order to remove alcohol fraction and decrease boiling temperatures of 50% and 90% recovered. Reaching the values determined by the Standard will give possibility to increase the content of biocomponent in mixtures of biokerosene.

Development of aviation techniques constantly moves to increasing of speeds and heights of aircrafts' flights, improvement of efficiency, reliability and life span of engine units. Consequently, this tendency causes increase in required volume and quality of fuels for gas-turbine engines. Today, the search and development of new alternative technologies of aviation fuels production from renewable resources become more and more popular. Biokerosene is seemed to be appropriate alternative to traditional aviation fuel due to the following factors: wide availability of the feedstock used for its production, relative simplicity of it manufacturing, considerably lower cost of the end product comparing to oil-derived aviation fuel, significantly lower emissions of harmful substances contained in exhaust gases, zero contribution to global warming effect during the whole lifecycle of the product. However, possessing the number of advantages, biokerosene still has issues, that are not enough investigated. The question of our interest is if biokerosene can provide such physical-chemical and exploitation properties as traditional aviation fuels do.

Conclusion

The article outlines modern perspectives of transition from conventional to alternative aviation fuels. The present ecological situation determined by the activity of aviation industry is presented. There is a short review of the world experience in use of alternative aviation fuels, the most widely used technologies and raw material for its production. The technology of aviation biokerosene production and its future perspectives are discussed. The results of investigations of the fractional composition of rape oil-derived aviation biofuels.

UDC 504.054:656.71(045)

O. Shtyka, postgraduate student,
T. Bilyk, PhD in Biological Sciences (National Aviation University, Ukraine)

ESTIMATION OF SOIL QUALITY ON THE TERRITORIES OF FORMERS AIRPORTS APPLYING OF ZINC EQUIVALENT OF POLLUTANTS

The problem of soil pollution in the zones of former airports is the object of considerable attention in the this publication. Polyelement soil pollution on the airports territories was analyzed on the basis of the zinc equivalent of pollutants (Zn_{eq})

The widespread environmental issue is pollution of the lands with toxic heavy metals due to different anthropogenic activities, but air transport industry does not form an exception. Mentioned contaminants can penetrate into soils resulting from carrying out various technological processes in the zones of airports and consequently the main sources in operation period are considered to be aircrafts, additional techniques, fuel depots, the departments of repairing or maintenance hangar (MH), storages of toxic and hazardous chemicals etc. [1, 2]. Moreover heavy metals belong to persistant pollutants and their residence time in soil matrix can be of the order of hundreds of years. Degradation of contaminated soils is able to cause the secondary contamination of the environment with accumulated toxicants. Unlike organic pollutants (mainly fuels andother oil products) metals are not degraded biologically thus they are transformed from one organic complex/oxidation state to another [3]. In postoperation period the sources and character of potential pollution with heavy metals depend directly on fulfilled activity (although mentioned territories are regarded to be suspended, nevertheless can be used as building and harfull wastes storage, service station location etc.).

Heavy metals spreading in the soil profiles is defined by intensity of pollutants migration in the system «air-soil» and determinant external factors are wind direction and speed, emissions altitude and their chemical and physical characteristics, relief, air humidity etc. In general, soils degradation and deterioration, alteration of the landscape are considered to be the dominant negative consequences of the excessive concentrations of heavy metals [3].

The investigation focuses on estimation and analysis of the soil quality in the zone of former airports due to applying zinc equivalent of metals (Zn_{eq}) with the purpose to assess synergetic effect of pollutans and the anthropogenic loading on the environment.

Therefore the object of investigation is soils in the zones of former airports and the subject is assessment of the soil quality on the territories of objects by means of mentioned index applying. The research work was fulfilled at the Ecological Department of the National Aviation University.

The civil airports located in Khmelnytsky and Volyn were examined as former objects for the comparative assessment. The territories of the investigated objects were divided into the similar regions, where the topsoil (0–20 cm) were sampled at the each defined position according to DSTU 4287:2004. The concentrations of Pb, Co, Cd, Cu, Fe and Zn in the topsoils were determined amenably to the adopted standards DSTU 4770.2:2007–DSTU 4770.9:2007.

Initially assessment of the soil quality was carried out due to calculation of the ratio of pollutants content in the investigated topsoil layer to their maximum permissible concentration (MPC).

The zinc equivalent of metals is used to estimate the polyelemental soil pollution with heavy metals on the territories of mentioned former airports. Proposed index is defined as multiplication of the ratio of zinc MPC (or background) to the certain metals MPC (or background) and their actual concentrations in the investigated soils. Thus a level of polyelemental pollution is calculated as a sum of zinc equivalents of the investigated metals [4, 5].

The results of polyelemental contamination level calculation are represented in figure 1.

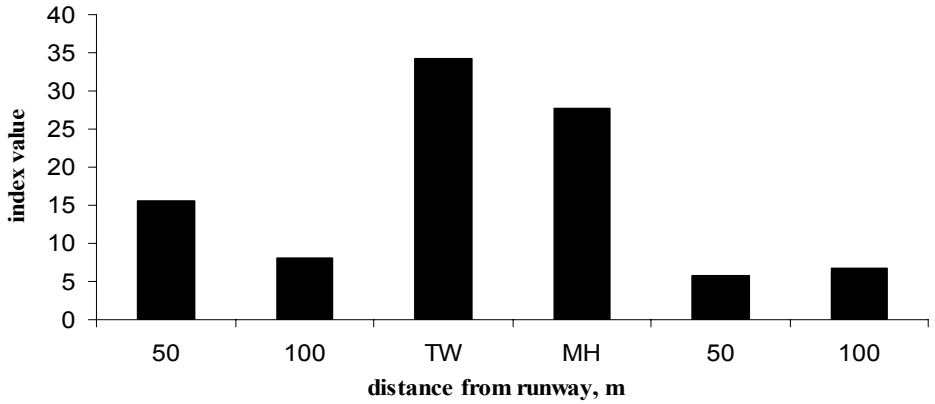

Fig.1. Toxicity of soils in the zones of former airports according to values of the zinc equivalent of investigated metals: 1 – former airport in Volyn region; 2 – former airport in Khmelnytsky region; TW – taxiway, MH – maintenance hangar

Thus soils of the former airport (in Volyn region) have the higher level of pollution, especially near the taxiway and maintenance hangar. The value of index that characterized 50m zone from a runway is also higher for early mentioned airport. The reason may be more intensive rate of traffic flow and respectively stronger loading on the environment, including the soil matrix. In case of both former airports the soils at distance 100 m from runway have the same contamination level unlike in contrast to others. According to the received results, in general concentrations of heavy metals (mobile forms) in the topsoil layer on the airports territories do not exceed significantly defined MPC, but special zones with the heightened content of pollutants were defined.

Conclusion

Thus applied zinc equivalent index of metals is one of the important parameter that should be taken into consideration in the process of the complex assessment of soils quality in the zones of former airports. Appling the proposed soil environment indexes allows to take into consideration the synergetics action of chemical pollutants that are present in the environment. The results indicate that soils in the zone of the former airports are classified as moderately and weakly polluted.

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UDC 665

Ing P.P. Mittertreiner ,
Quality Engineer at ProRail (the Dutch Railroad Network Administrator),
Treasurer of the European Lubricating Grease Institute (ELGI)

SPEAKING THE SAME LANGUAGE: TRIBOLOGY

The problem of tribology is the object of considerable attention in the this publication.

Being born in a small country below sea level with a language not familiar to many, one learns at a young age the benefits of speaking the same language as others.

In my youth we could receive more German TV-programs than Dutch, most lyrics of pop-songs were in English, if you wanted to impress a young lady, a poem or chanson in French could do wonders and Belgium beers tasted great!

At the University, most technical books were in German or American (this was cheaper than translating them). In the professional life, most customers and suppliers are not Dutch either.

For my work on the board of the ELGI we host at our annual conference representatives of about 30 different countries.

Almost all speak more than one language so we'll always find a way to communicate.

Of course we make some mistakes which sometimes can lead to misunderstandings, but there is always a positive attitude to cooperate, with everybody.

That is why I love the world of Tribology and Chemmotology so much.

How different this sometimes is in the rest of the world, where they apply tribology without knowing that they do so, is illustrated by the following story:

A steel wheel of a train, 'rolling' on a steel railroad track, can be considered as the worlds largest ball-bearing. And for those who never realized it: it runs dry!
This results in a coefficient of friction varying between 0.05 and 0.7 creating either high wear and high noise (at high friction) or unpredictable behavior at traction and breaking (at low friction).

With rising costs of labor, tightening environmental laws and stronger complaining passengers and house-owners this forms an increasing problem for European railway operators.

A few years ago, we started in The Netherlands a comprehensive test to 'lubricate' the wheel-rail interface with a friction-modifier. The product is applied from an on-board system on the top of rail and on its flange, by a train who measures the friction of the contact before it decides weather yes or no to apply (no human interaction). Depending on the weather and tonnage approximately once every 200 wheel passages.

The goal is to finally imply this on the whole Dutch rail-network (6800 km) so not only on specific problems areas. Which means that one out of five trains should be equipped for the needed coverage.

The tests on three different lines with three different train-operators are approaching the end phase: the concept proved to be highly beneficial and the technical problems seem to be mastered.

The benefits are a remarkable reductions of squeal and noise, less occurrence of head-checks (cracks that can lead to rail-buckling), half the need for expensive preventive grinding of the rail-head and less autumn-problems with slippery track.

It is still too early to decide on less wear (in the Dutch situation).
To reduce the number of test-variables (to first prove the concept) all test-trains were equipped with the same type of applicator and the same friction-modifier.

When enrolling the system to the rest of the network and fleets, due to European Law, we cannot buy from our test-supplier everything we need to equip the rest of the fleet but we have to make an open tender.

This means specifying what we want and need in functional specs.
Here the above mentioned problem arises: no body seems to speak the same language!
A tribologist talks about Stribeck-curves, unknown to rest of the world.

A manufacturer of the spraying-equipment talks about specifying the pressure, the throughput and the nozzle and those are specified he can build the most beautiful machine. The lubricant manufacturer wants to know the desired type of soap: lithium- or aluminium complex thickener, and he can make a wonderful product.

The rail-network owner wants a product that is effective (reducing noise and wear) and safe (breaking should be possible under all circumstances).

The train-operator wants it to be cheap and have the same properties throughout summer and winter (no two types, no manual temperature dependent adjustments).

Resulting in a situation where nobody seems to understand what the other means but also has no clue why all the others do not understand him - whereas he states his needs so clearly.

But there is light on the horizon.

The European Lubricating Grease Institute (ELGI) started a working group (RLWG) to tackle the problems around Railway lubrication with the focus on the wheel-rail-contact.

In this group we try to get together the lubricant-industry, the railway companies and equipment manufacturers.

At the moment, representatives of the Swedish, Russian and Dutch railways are present. Starting up is a little bit difficult, for the lubricant industry fears the competition inside the working group. The European market, however is large enough for all: it is huge!
At the same time the International Union of Railways (UIC) has started forming a working group ("Wheel/Rail Conditioning and Lubrication" which will officially start as per 1-1-2013) on the same topic.

The UIC makes the TSI's (European laws for railways) and railway-norms.

She has set a strict time frame to deliver a TSI on wheel-rail lubrication in two years time (1-1-2015). Most EU-railway companies will be represented and there is also interest form China and Australia.

Conclusion

The goal of the two groups is to end up with a uniform set of specifications and measuring methods which helps all parties to understand each other and avoid unnecessary testing (performing product-testing in a railway environments costs millions of Euro's and a long time – at least all seasons, per product, and are difficult due to the high safety regulations on the track).

There is a close cooperation between these two working groups, trying to avoid double work (or work not done).

Both groups are in a starting up phase and I'm happy to invite you to cooperate so we can learn from each other and benefit from the fact that at least tribologists speak the same language.

UDC 665

WU Yao, ZHANG Bo, TANG XiaoFeng,
JIANG Jie, XIE BuJin, ZHANG LiGuo
(Civil Aviation University of China, Tianjin, China),
MA DeQi (Tianjin Entry-Exit Inspection and Quarantine Bureau)

THE STUDY OF SYNTHESIS PROCESS AND PERFORMANCE OF HIGH OIL-ABSORBING RESIN PREPARED BY WASTE TIRES

A kind of oil-absorbing resin is synthesized in liquid-phase suspension process that using waste tires as raw material, a - methyl styrene as monomer, benzoyl peroxide (BPO) as initiator, divinylbenzene as the crosslinking agent, liquid paraffin as the solvent ,and adding the proper amount of dispersing agent and Porosifer in this experiment.

Experimental proportion that waste tires and monomeric a - methyl styrene of the ratio of 3:1, 0.8% and 1.2% of the monomer`s weight of the amounts of crosslinking agent and initiator are adopted. At last, we can come a conclusion that Oil-absorbing resin`s aviation kerosene oil absorption rate is up to 5.6g/g when the amounts of dispersant and porosifer are 0.9% and 50% of the monomer`s weight.With the rapid economic development in the world, the demand of energy, especially oil, is growing in people`s life. But the mass exploitation and use of oil has caused serious environmental pollution: oil tankers, oil leakage, pipeline accidents, and emissions of oily wastewater and waste liquid have caused serious damage to the Earth's aquatic ecosystem. Car usage is also growing with the oil pollution, leading to the number of waste tires continue to increase. It is also an urgent task which requires a global approach to dispose waste tires and improve the environment.

A new type of oil-absorbing resin is prepared with waste tires as main raw material in the study. It turns waste into treasure. Oil-absorbing resin is a new functional polymer material that can replace the traditional oil-absorbing materials. It's less dense than water and particularly suitable for handling floating oil. It is a kind of new self- swelling functional polymer material with both imbibitions and absorption. It has many advantages, such as high oil absorption rate, the abundant variety of oil-absorbing, good oil-water selectivity, good oil retention under pressure, small size before oil-absorbing, good heat and cold resistance, high speed of oil absorption, convenient recycling, not easy to spill with the compression, easily store and transport and so on.

Reagents and instruments. Waste tires; divinylbenzene; peroxide benzoyl; a - methyl styrene; liquid paraffin; gelatin; tricalcium phosphate; sodium dodecyl sulfate; ethanol. Scanning electron microscopy analyzer（XL-30）, PHLIPS in Netherlands; Fourier infrared absorption spectrometer（Avatar 300）, Nicolet in America; High - speed universal grinder（0～1 kg）, JingCheng Machinery Co., Ltd. Qingzhou, Shandong Province; Constant temperature water bath（YXZ Type）, HuaLu Electric Instrument Co., Ltd. Zhen City, Shandong Province; Electronic analytical balance（FA2004N）, Shanghai Precision Scientific Co., Ltd; An electric mixer（D-8401 Type, Huaxing Scientific Instruments Corporation, Tianjin.

At first take a certain amount of waste tires and a-methyl styrene monomer in the beaker, and dissolve it into homogeneous phase with liquid paraffin. Then transfer it to a four-opening round-bottomed flask (250mL) with a stirrer, condenser, thermometer, and N_2 guide tube. Keep it in 45℃ water bath for 30 minutes. Dissolve a certain proportion of gelatin, tricalcium phosphate, and sodium dodecyl sulfate in 150 mL of deionized water and add it in the four-opening round-bottomed flask. Keep the same temperature for 20 ~ 30min under protection of Nitrogen. Add the crosslinking agent (divinylbenzene) and initiator agent (benzoyl peroxide), then heat it to 80 ~ 85 □ under protection of Nitrogen and react for 6 hours. Extract and filter the product after completion of the reaction. Get a kind of granular polymer by washing the product in hydrochloric

acid（1mol/L）.After drying at 80oC, agitate and extract it with tetrahydrofuran and cyclohexane mixture for 12 hours. At last we can get the oil-absorbing resin after drying it to constant quality.

Performance testing and structural characterization.

(1) Scanning electron microscopy characterization （SEM）

Take shape appearance with scanning electron microscopy XL-30）, PHLIPS in Netherlands) and observe the surface features of waste tires and resin before absorbing oil. (2) Oil absorption rate

Weigh a certain amount of resin accurately, and then put it in the aviation kerosene. Filter out the excess oil with filter paper after swelling equilibria. Weigh oil-absorbing resin and get its accurate quality at last.

The computing formula of Oil absorption rate: Q=（m2-m1）/ m1

m1-the quality of resin before absorbing oil, g; m2-the quality of resin after absorbing oil, g.

Part two. Conclusion and discussion

1. Influence of dispersant on oil absorption property of oil-absorbing resins

The function principle of dispersant is to attach to the surface of the droplet and form a protective film, so that it can protect the colloids. If the amount of the dispersant is too small to protect the grains, suspension polymerization is not stable, and the grains are easy to agglomerate, on the contrary, the diameter of the grain is smaller.

Change the dispersant content in the synthesis system, which is dispersant share the mass percentage of the monomer, under the other conditions (Monomer ratio, the amount of initiator and cross-linking agent) remain unchanged, plot the dispersant content and the oil absorption rate, as fig. 1.

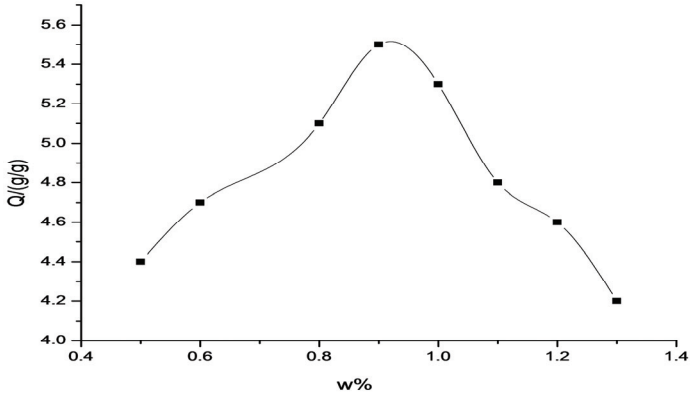

Fig. 1. The amount of dispersion agent` impact on the oil absorption rate

According to the figure, oil absorption rate of the resins increases along the curve when dispersant content is between 0.5%～0.9%,and when dispersant content beyond 0.9%, oil absorption rate of the resins decreases slowly. Thus when dispersant content is 0.9%, oil absorption rate of the oil absorption resins is largest, that is 5.5g/g.

Influence of porogen on oil absorption property of oil-absorbing resins.

Oil absorption rate of the resins closely relates to the internal gap structure of the resins. It is essential for improving the internal gap structure of the resins to add porogen in the process of synthetic resin. This experiment studies the influence of porogen content on oil absorption property of oil-absorbing resins, by changing the porogen content, that is porogen share the mass percentage of the monomer, under the other conditions remain unchanged, plot the amount of porogen and the oil absorption rate, as fig. 2.

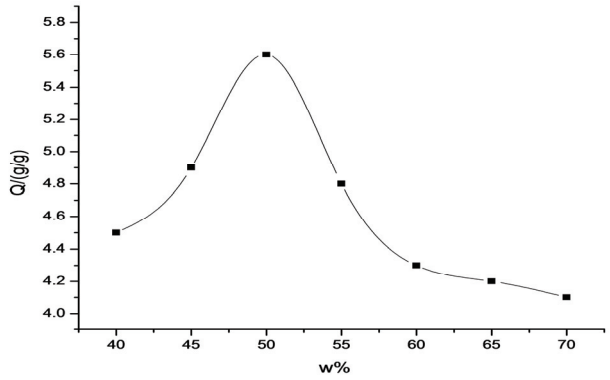

Fig. 2. The amount of porosifer` impact on the oil absorption rate

According to the figure 4-2, oil absorption rate and capacity of the resins both increase along the increasing of the amount of porogen. When the amount of porogen accounted for 50% of the monomer, oil absorption rate of the resins is largest, oil absorption property is fine, and it reaches saturation gradually. The highest oil absorption rate is about 5.6g/g.

Oil absorption rate of resin under the ideal proportion.

We can draw the following data figure by measuring the oil absorption rate of oil-absorbing resin under the ideal proportion.

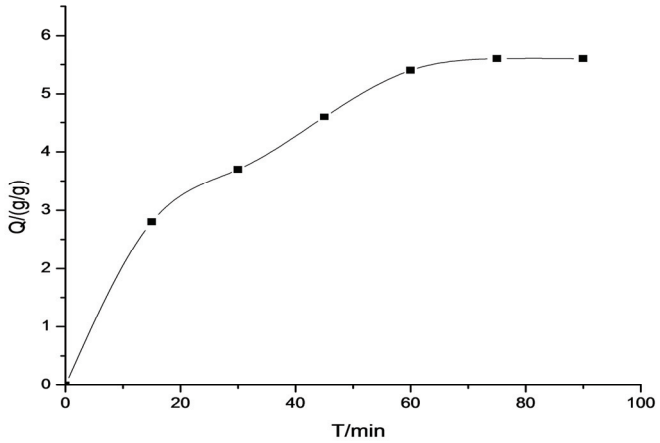

Fig. 3. Change curve of oil absorption rate

Fig. 3 shows that the oil absorption rate of oil-absorbing resin first begin to increase, then oil absorption becomes saturated and the oil absorption rate remains constant after 60 minutes. The maximum oil absorption rate is 5.6g / g.

Characterization in scanning electron microscopy（SEM）

The following figures are enlarged scanning electron micrographs of waste tire and oil-absorbing resin in the size of 20 μm.

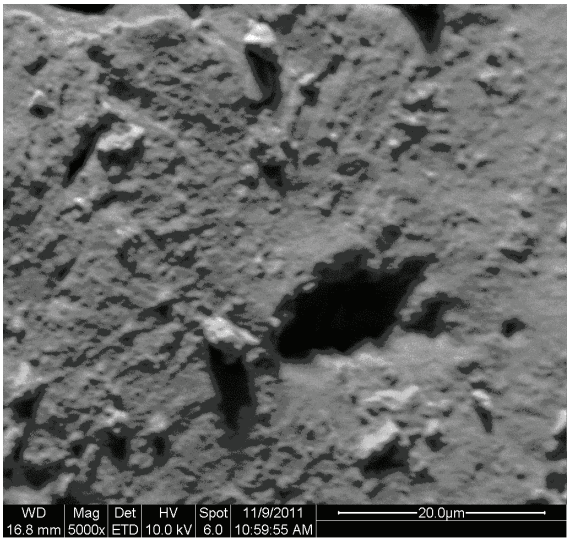

Fig. 4. The waste tire

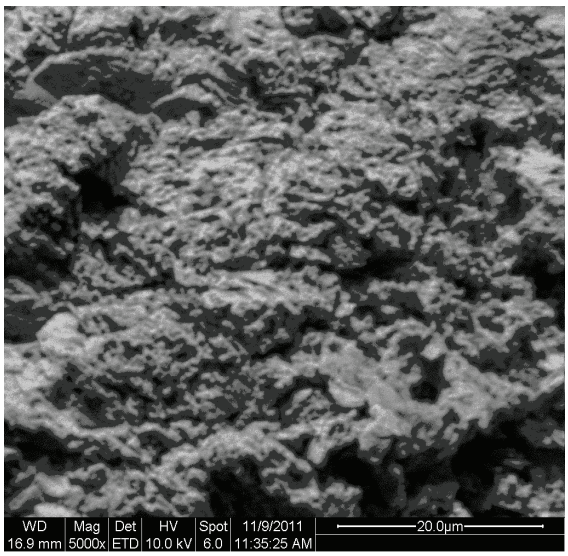

Fig. 5. Oil-absorbing resin before absorbing oil

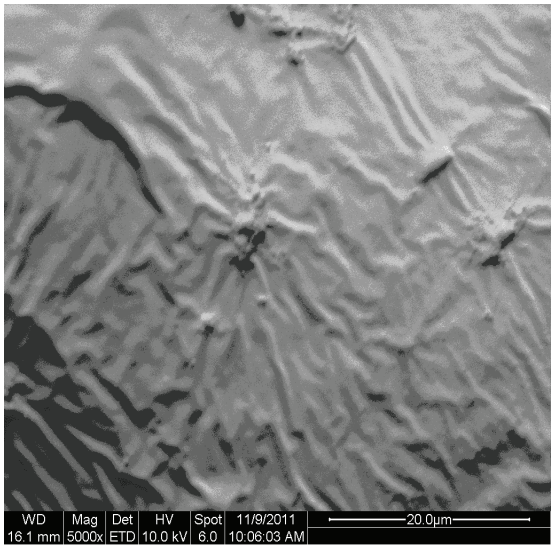

Fig. 6. Oil-absorbing resin after absorbing oil

Figure 4 shows the surface structure of the waste tire. There are a little debris and gully on the flat surface of waste tire in the picture.

Figure 5 shows the surface structure of oil-absorbing resin before absorbing oil. There are a lot of particles, holes and folds on the surface of oil-absorbing resin.

Figure 6 shows the surface structure of oil-absorbing resin after absorbing oil. The oil-absorbing resin is relatively replete after absorbing oil, there are a little fold and no particle and hole on the surface of it.

Conclusion

We can get the oil-absorbing resin with highest oil absorption rate when waste tires and monomeric a - methyl styrene of the ratio of 3:1, 0.8% and 1.2% of the monomer`s weight of the amounts of crosslinking agent and initiator, 0.9% and 50% of the monomer`s weight of the amounts of dispersant and porosifer.

In this condition, the absorption rate of the resin for aviation kerosene is up to 5.6g / g, so it has good oil absorption. We can see that there are many holes, ravines, folds and debris on the surface of oil-absorbing resin by SEM. These are the typical surface structures of oil - absorbing resin.

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UDC 66 2.765 (043.2)

E. Novoselov, PhD in Chemical Sciences
(National Aviation University, Ukraine)

BIOFUEL BLENDING RESEARCH

The problem of biofuel blending research is the object of considerable attention in the this publication.

Biodiesel fuel is manufactured from green plant oils, animal fats and from recycled cooking oils in the chemical process named transesterification. Its chemical composition corresponds to alkyl esters of fat acids. It is energy efficient fuel, which can displace petroleum-derived products; it can be used as up to 20% content in blends with traditional fuel in most diesel engine equipment without any modifications, it can reduce global warming gas emissions, tailpipe emissions, including air toxics. It is nontoxic, biodegradable, and suitable for sensitive social environments. Taking but into account such drawbacks of biodisel, as high temperature of crystallization and lower heat content we have attempted to improve these parameters by addition of a high-energy content "hydrocarbon 1" - [(1*S*, 5S)-6,6-dimethyl-2- methylenebicyclo [3.1.1] heptane ($C_{10}H_{16}$)]. Hydrocarbon 1 was chosen on the basis of chemmotological comparison with US manufactured modern synthetic reactive fuel Jp10 major constituent - exo-tricyclo [5.2.1.02,6] decane (hydrocarbon 2), which has such proven advantages as: low temperature of crystallization (- 79 ^{o}C); high density (935-943 kg/m^3) and high heat of combustion ~ 42.10 MJ/kg. Hydrocarbon 1 is a timber wood biomass derived compound of bicyclical structure that is structurally similar to tricyclic hydrocarbon 2 – major component of Jp10. This compound (1) is mono unsaturated hydrocarbon of molecular mass 136.24 g/mol, it is a liquid of density 0,86 g·cm^{-3} with melting point – 62 °C, boiling point 162 °C, it is practically insoluble in water. Another feature that makes it a compound of higher energy content is presence in its structure a strained four membered hydrocarbon ring. It makes it similar to well known 1-methyl-1,2-dicyclopropyl-cyclopropane- "cycline" which was used at block Zenyth 3SL.

Table 1.

Calculated caloric value vs. fuel mixtures composition

Mixture ratio (by volume) hydrocarbon 1/biodiesel MERO	Heat of combustion (MJ/m^3)	Heat increase, %
0/100	32872,1	0
5/95	33166,3	0,89
20/80	33808,1	2,77
40/60	34745,7	5,40
80/20	36619,3	10,23

Mixing this bicyclic compound hydrocarbon 1 and a biodiesel obtained from rape oil, (methyl ester of rape oil, MERO) we have prepared a row of mixed fuel compositions of higher energy content, the properties of which are presented in the table 1. Our experiments also have shown (table 2), that the developed fuel blends, containing higher calorific value additives, demonstrate also quite appropriate behavior at lower temperatures.

Table 2.

Experimental values of cloud point and pour point vs. fuel blends composition

Mixture ratio (by volume) hydrocarbon 1/biodiesel MERO	Cloud point, °C	Pour point, °C
0/100	0	-10
5/95	-5	-16
20/80	-6	-30
40/60	-10	-30
80/20	-21	-35

Conclusion

Our further research is aimed on optimization of relationships of combustion heat, viscosity and freezing properties in order to adjust the new motor fuel compositions properties to the requirements of chemmotology.

UDC 662.753 (045)

O.Ya. Kuznetsova, PhD. (National Aviation University, Ukraine),
Ja.M. Netreba (National Aviation University, Ukraine),
A.M. Solovjov, D.E. (National Aviation University, Ukraine)

INVESTIGATION OF HYDRAULIC FLUID «HYDRAUNYCOIL» FH-51 COMPONENTS CHEMICAL TRANSFORMATIONS DURING LONG-TERM USE

In the work investigation results of structural-group composition change of hydraulic liquid FH-51 samples with various terms of operation are presented at its application in the aircraft hydraulic system.

Intro. In autrors' articles structural-group composition and chemical transformations that hydraulic liquid АМГ-10 and FH-51 molecules undergo at its application is analyzed. It is determined that molecules of definite carbohydrates undergo considerable chemical transformations that worsen its operational properties. Since operating liquid longevity without its complete replacement in aircraft hydraulic system is long enough, it is of great scientific and practical interest to investigate the dynamics of chemical transformations in molecules of chemical compounds of these hydraulic liquids during definite time interval of their maintenance in aircraft hydraulic system. In this work analysis of chemical transformations that occur in carbohydrates molecules of so-called «first fraction» hydraulic liquid FH-51 samples during different operating life is provided.

Investigation results. Such hydraulic liquid FH-51 samples were investigated:

- commodity liquid;
- after flying time 300 hrs;
- after flying time 380 hrs;
- after flying time 3600 hrs.

By means of atmospheric-vacuum distillation according to ГОСТ 2177–66 these samples were divided into separate fractions:

- boiling start – till opacity appearance at atmospheric pressure (first fraction);
- fractions to be distilled in vacuum at 1 mmHg (second fraction);
- residue after sample distillation.

In Tab. 1 results of hydraulic liquid FH-51 samples distillations are given.

Output of the first fractions of liquid samples after flying time 300 and 380 hrs essentially reduced in comparison with output of the first fraction of commodity liquid. On the contrary, output of the first fraction of sample after flying time 3600 hrs is on 2.2% higher than the first fraction of commodity liquid. It testifies the changes in structural-group, homological and fractional composition that happened during its exploitation in aircraft hydraulic system.

In Tab. 2 results of mass-spectral analysis, provided by methods described in [3,4], to determine structural-group and homological composition of the first fractions of hydraulic liquid FH-51 samples are given.

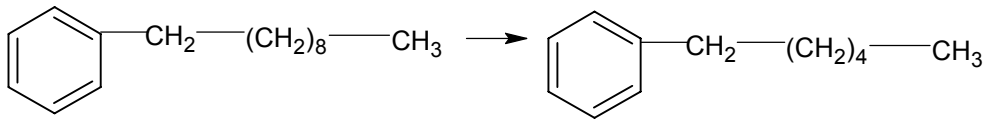
As we can see, output of the first fraction of sample after flying time 300 hrs reduced on 5.2% in comparison with the sample of commodity liquid, and after flying time 380 hrs – on 17.1% in comparison with the first fraction of sample after flying time 300 hrs (look tab. 1). Meanwhile, in the sample after flying time 380 hrs the content of mono-, bi- and tricyclic naphtenic carbohydrates has considerably reduced in comparison with both commodity liquid samples and samples of liquid after flying time 300 hrs (look tab. 2). Considerable augmentation of aromatic carbohydrates, especially alkylbenzene content (on 10.2%) in comparison with samples after flying time 300 hrs is observed. But, only homologues $C_7 - C_{11}$ content increased greatly. It testifies that in process of exploitation of hydraulic liquid FH-51 in aircraft hydraulic system destructive breakage reactions of alkyl radicals of high-molecular alkylbenzenes $C_{12} - C_{16}$ take place.

Table 1

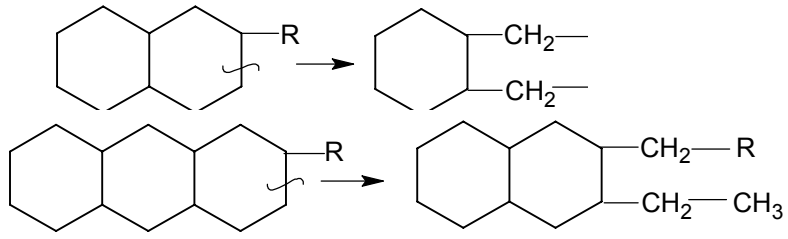
Hydraulic liquid FH-51 samples distillation results

Fraction name	Distillation values			
	Commodity liquid	After flying time 300 hrs	After flying time 380 hrs	After flying time 3600 hrs
Boiling start, ˚*C*	208	208	205	123
First fractions output, % mass	71,6	66,4	49,3	73,8
Boil-out borders of another fractions, ˚*C* (at 760 mmHg)	285–354	236–344	242–340	285–354
Output of other fractions, % mass	16,9	23,1	39,8	16,4
Residue, % mass	11,0	10,0	10,8	9,0
Losses, % mass	0,5	0,5	0,1	0,8

This caused the reduction of content of homologues $C_7 - C_{11}$ and augmentation of content of paraffins, for instance:



Destruction of polycyclic naphtenic carbohydrates with opening of one naphtenic cycle results in formation of structures with lower cycles quantity in molecule, for instance:



As a result, mono- or, correspondingly, bicyclic naphtenes form. Then, in process of dehydration they transform into unsaturated naphtene carbohydrates with one or two double bonds and into alkylbenzenes:

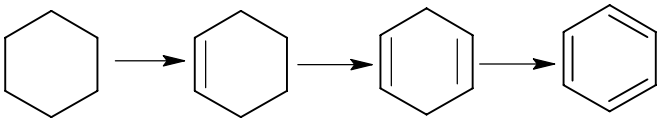


Table 2

Structural-group and homological composition of the first fractions of liquid FH-51 samples

Types of carbohydrates and their homologues denomination	Concentration, % rat.			
	Commodity liquid	after flying time 300 hrs	after flying time 380 hrs;	after flying time 3600 hrs
Paraffin	9,6	13,9	11,6	21,0
Naphthene, including:	85,9	81,6	68,9	73,2
mono-	27,7	20,8	21,0	27,6
bi-	43,1	42,6	34,7	33,6
tri-	14,0	17,5	12,6	11,7
tetracyclic	1,1	0,7	0,6	0,3
aromatic, including:	4,5	4,5	19,5	5,8
alkylbenzene, namely:	2,8	2,7	12,9	3,8
benzol	N.d.	–	–	N.d.
toluene	N.d.	6,0	4,4	N.d.
xylol	N.d.	7,5	12,2	N.d.
isomer C_9	N.d.	8,7	10,3	N.d.
C_{10}	N.d.	5,9	7,5	N.d.
C_{11}	N.d.	7,0	8,2	N.d.
C_{12}	N.d.	9,5	9,8	N.d.
C_{13}	N.d.	14,1	10,7	N.d.
C_{14}	N.d.	13,9	11,9	N.d.
C_{15}	N.d.	12,0	12,9	N.d.
C_{16}	N.d.	8,3	6,5	N.d.
C_{17}	N.d.	5,0	3,5	N.d.
C_{18}	N.d.	2,1	2,2	N.d.
Mononaphtene-benzol	1,3	1,1	5,1	1,5
Dinonaphtene-benzol	0,4	0,4	1,3	0,5
Naphtalene	–	0,3	0,2	–
First fractions output, % mass	71,6	66,4	49,3	73,8

Note. N.d. – not determined.

This also resulted in augmentation of high-molecular alkylbenzenes concentration.

As a result of such destruction and dehydration processes total alkylbenzene concentration and relative concentration of low-molecular homologues $C_7 - C_{10}$ (at the expense of alkyl radicals destruction) increases in the first fraction of liquid after flying time 380 hrs. Accordingly, in this fraction mononaphtenebenzol concentration is also increased.

Generated unsaturated mono-, bi- and tricyclic naphtene structures are less stable and compressible. Obviously that compression of unsaturated and naphtene-aromatic compounds that form during dehydration processes leads to reduction in concentration of all types of naphtene compounds in the first fractions of all liquids after flight time and to augmentation of concentration of corresponding compounds that have higher molecular mass and boil-out temperature. As a result, output of the second fractions of these samples increased comparing with commodity liquid sample. In this way, augmentation on 6.2% of the second fraction output of sample after flying time 300 hrs and augmentation on 22.9% of the same fraction output of sample after flying time 380 hrs comparing with the second fraction of commodity liquid sample can be explained by densification process of unsaturated carbohydrates. And besides, even small difference in flying time (80 hrs) causes significant change in structural and homological composition of liquid FH-51 (Tab.2).

By turn, destruction of all types of carbohydrates that correspond to the second fraction and residue boil-out temperatures results in considerable increase of output of first fraction of sample after flying time 3600 hrs up to 73.8% (output of the first fraction of commodity liquid amounts to 71.6%, output of the first fraction of sample after flying time 300 hrs amounts to 66.4%, and after flying time 380 hrs – 49.3%). Probably, in the both last cases intensive processes of low-molecular unsaturated compounds densification took place. By such processes it can be explained that border of boil-out of commodity liquid is identical to boil-out of liquid after flying time 3600 hrs. Meanwhile, the first fractions analysis results testify to the significant change in structural-group composition of hydraulic liquid.

Conclussion. Investigation results expounded in the work certify significant changes of hydraulic liquid FH-51 structural-group composition during long-term use. These changes occur owing to course of the following processes:

- destructive breakage reactions of alkyl radicals of high-molecular alkylbenzols $C_{12} – C_{16}$, that resulted in reduction of homologues $C_7 – C_{11}$ concentration and augmentation of paraffin concentration;
- destruction of polycyclic naphtenic carbohydrates with formation of structures with lower cycles quantity in molecule;
- dehydration of mono- and bicyclic naphtenes with formation of unsaturated naphtene carbohydrates with one or two double bonds and into alkylbenzols.

Generated unsaturated mono-, bi- and tricyclic naphtene structures are less stable and compressible. Obviously, compression of unsaturated and naphtene-euodic compounds that form during dehydration processes leads to reduction in concentration of all types of naphtene compounds in the first fractions of all liquids after certain flight time.

As each group of carbohydrates corresponds to certain exploitation charachteristics of hydraulic liquid, the result of such processes is reduction of thermooxidative stability of the liquid during its exploitation.

Consequently, chemical transformations that occur in hydraulic liquid FH-51 with increase of usage term decrease operational reliability of an aircraft that influences on the level of flight safety.

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T.A. Kondratyuk, PhD («Institute of Biology» «Educational and Scientific Centre» Taras Shevchenko National University of Kyiv, Ukraine)
E.S. Kharkevich, PhD (D.K. Zabolotny Institute of Microbiology and Virology of NAS of Ukraine)
I.N. Kurchenko, PhD (D.K. Zabolotny Institute of Microbiology and Virology of NAS of Ukraine)

FLIGHT SAFETY: BIORESISTENCE PROBLEMS OF AVIATION FUEL, PRODUCTS AND MATERIALS USED IN AIRCRAFT CONSTRUCTION

The biodeterioration problems of aviation fuel and aircraft fuel system are discussed. It was established that microscopic filamentous fungi (Hormoconis resinae, Aspergillus niger etc.) were dominant in the complex of microorganisms found in the fuel of the airplane operated in subtropical conditions. The results of tests on resistance of a number of materials used in aircraft construction to the fungal attack are presented. Proposals for optimization of the construction processes and operation of aviation equipment and materials in conditions of biological load are provided.

Microscopic filamentous fungi are recognized as dominant destructors of various anthropogenic products and materials. The microscopic fungi are able to adapt to the different conditions of existence due to their physiological, biochemical and morphological peculiarities for the development in wide range of materials. These fungi may cause the following damages: different deformations, complete destruction of materials, deterioration of their performance etc.

Numerous cases of breakdown and malfunctions in aviation and space techniques, ships, cars, engineering machines etc. have been reported under influence of biodestructors [1, 5, 13].

A lot of data concerning to damage of aviation fuel and different oil products by different microorganisms (filamentous fungi, yeasts, bacteria) in storage, operation and transportation conditions are hitherto accumulated. Active development of microscopic fungi (*Hormoconis resinae, Penicillium genera, Aspergillus fumigatus, Paecilomyces variotii* etc.) on fuel and in fuel systems found to be the most dangerous because fungi form thick mycelium accumulation of which clog the pipes and fuel filters as well as create local areas of corrosion on the surface of these parts of fuel systems. Developing on fuel, microorganisms and their aggressive metabolites cause the changes in its composition and properties, corrosion of equipment and could be the reason of faults of fuel pumps, filters and measuring instruments. The last, in its turn, could cause serious emergency conditions. The danger of fuel biodeterioration increases in conditions of high temperatures, moisture, especially in tropical and subtropical zones [2, 3, 5, 10, 12, 16, 17].

We conducted microbiological analyses of samples of aviation fuel TS-1 from different structural units of fuel system of the several airplanes (one of them was operated in subtropical conditions; another took single flights from Kyiv to southern and western regions of Ukraine with refueling in these regions), as well as samples of the same fuel after three years storage in laboratory conditions [6, 8]. It was shown that the fuel of the airplane operated in subtropical conditions was affected by complex of filamentous fungi, yeasts and bacteria that led to mucus forming on surfaces of fuel systems (filters, fuel filler caps), to damage of rubber of fuel tanks, to formation of bunches of mucus particles of microorganism microcolonies. The microscopic filamentous fungi were dominant among these microorganisms. Furthermore the following species *Hormoconis resinae* f. *avellaneum* (accepted to be known destructor of hydrocarbons fuel), *Aspergillus niger, A. fumigatus, Penicillium* genera, *Rhinocladiella* sp. found to be dominant species among 18 isolated fungi. The fuel from tank and filter was the most polluted by fungi – 2.6×0^3 и 1.7×10^3 CFU/ml correspondingly (CFU – colony forming units: cells, fungal mycelium fragments). The size of filter pores promotes the penetration of CFU of fungi and bacteria in the airplane fuel system: nominal filter capacity (paper AFB) is 5 μm, total – 10 μm, just as the sizes of spores and viable fragments of mycelium are in frames of 2,5-12 μm. It was found that pH of aviation fuel TS-1 was 2 times higher in case of microorganism development in comparison with control indexes (0,49 and 0,23 mg KON on 100 g of fuel, correspondingly).

The most part of isolated fungi (*Hormoconis resinae* f. *avellaneum*, *Cladosporium herbarum*, *Penicillium* genera) preserved their viability after three years of storage of fuel in laboratory conditions. This fact confirms the high adaptation properties of microscopic fungi which can develop in wide range of different factors of environment.

Contamination of TS-1 airplane fuel by microorganisms including *Hormoconis resinae* f. *avellaneum* after single flights in different regions of Ukraine found by us may be was connected first of all with growth of microorganisms in browsers and pomp as well as on surfaces of fuel filler caps. Air, soil, water pools polluted by oil products, the systems of fuel lines, hoses etc. can serve as sources of contamination by filamentous fungi. The presence of phase separation "fuel-air" and condensed water on the walls of tanks promotes the development of biodestructors complex.

The conducting of different tests including the test on resistance to filamentous fungi is the compulsory condition when creation the new products and materials in the field of aircraft building. These tests are regulated by according normative document (standards) [4 et al.]. It is known that resistance of lacquer coatings, metals, which are covered by those lacquer coatings, and polymeric materials to fungi depends on their chemical content and conditions of operation etc. [5, 15]. Despite multipronged investigations in the field of biodeterioration of materials and products used in aerospace engineering these questions are in urgent need of the further study.

We carried out the tests on resistance of product for aircraft building to fungi according to GOST 20.57.307. – 76 (p. 4.17); GOST 9.048 – 89 (method 1) and «Program and method of preliminary tests" which was approved by Client. Product consisted of indication control unit, kolimator of flight information, and picture formation unit. The main materials of surface were the following enamels: EF-1118 PM black, semimat XB-5425 gray-blue, and ML-165 silvery as well as optic glasses. In experimental conditions studied materials (which were preliminary climatically tested) were found to be nonresistant to fungi (3-4 points). At the same time the resistance of optical glasses to fungi was evaluated in 2 points [7]. The growth of fungi was the most intensive on rough surfaces. The deposition of white mycelium structures of fungi, densely attached to the substrate, was observed on certain horizontal narrow areas. In some cases the small bulgings or convexities on enamel surface were registered too. The appearance of those damages could be due to influence of both fungi metabolites and high humidity or to combination of these two factors. Data obtained by us confirm the opinion of other authors that aging processes of materials and biodeterioration are in close relationship [14]. It confirms also that conclusion that tests of materials and product used in the aircraft building on resistance to fungi should be done after climatic tests or in some connections with the latter.

Recently the wide spectrum of new materials with predeterminated properties, improved strength and anticorrosion characteristics with using of modern technologies including nanotechnologies is being created and manufactured. Unfortunately these new materials are far from being tested on resistance to filamentous fungi. It is often connected with fact that in regulatory documents (particularly in TC) both demands concerning these tests and references on corresponding 'GOST's or 'GSTU's (which in the most cases do not exist in Ukraine) are absent. In certain cases manufacturers of new materials refuse to test them on resistance to fungi justifying their actions by creation of analogues of materials which gave a good account of themselves in other countries.

Various polymeric materials which can be destroyed by filamentous fungi are widely used in different fields of human activity [11]. Problems of biofilm formation on polymeric materials, where microorganisms (i.e. bacteria, actinomycetes, yeasts and filamentous fungi) play important role, are actively discussed in modern scientific literature. Our investigation showed that the development of microorganisms with different metabolic types which enforce destructive processes and testify the biofilm formation [9] was especially often registered on polymers (including acryl- and silicone-containing sealing materials and rubber in conditions of high humidity as well as at moistening by condensate water. Filamentous fungi, yeasts (*Aureobasidium pullulans* var. *pullulans* and species of the genus *Exophyala*), bacteria which synthesize polysaccharides play the main role in these complexes.

Seven different materials (including sealing materials, glues and paints) containing polyacrylates, acrylic polymers, silicons and artificial caoutchouc were tested on resistence to fungi according to the 'GOST 9.049-91'. It is found that resistence to the filamentous fungi depended on

species content of fungi mentioned. Formation of biofilm on material tested with the usage of fungal test-cultures after the 'GOST' mentioned was not observed. Majority of materials tested (six of seven tested materials) shown resistance to the fungal test-cultures recommended by the 'GOST' mentioned. Formation of the biofilm was observed only cases when fungal strains selected by us from polymers damaged in our previous studied were used as test cultures.

Long-term experience and data obtained by us during various investigations (creation, culture support and completion of the collection of filamentous fungi-destructors, mycological inspection, testing of different materials and products on resistance to fungi, investigations of fungicidal properties of a number of materials and products, investigations of adaptation strategies of fungi to extremal factors of environment etc.) give the opportunity to make the following conclusins. These conclusions proposed by us are settles requirements of the achievements and prospects of aircraft building field in Ukraine, ensuring the flight safety, prevention of faults in aeronautical engineering and guarantee of the aircraft traffic reability.

Conclusions

Obligatory audit trail of aircraft fuel and aircraft fuel systems on the presence of filamentous fungi with the usage standard mycological and microbial methods and identification of fungi obtained should be introduced into the practice of regulation checkup. Filters of the aircraft fuel systems, fuel filler cups and remains of used fuel should be checked on the presence of filamentous fungi first of all. It is especially important in condition of the aircraft operation in the the regions with tropical and subtropical climate.

Disinfection treatment of the aircraft fuel tanks, aircraft refueller, as well as fuel main-line trackage with replicate identification of the viable fungal cells should be done with some periodicity. Selection of some biocides and biocide fuel additives can be especially studied for these purposes too.

Mycological and microbiological examination procedure should be especially elaborated and proposed for including into corresponding regulations.

Investigations of new materials and products on the resistence to filamentous fungi should be carried out only by specialists (mycologists or microbiologists in this case). 'Program and principles of the preliminary tests' should be worked out and elaborated in the immediate participation of the specialists mentioned.

Tests on the resistance to filamentous fungi of the entire manufacture or its units can be done only in case of preliminary investigation of resistance to fungi of their separate portions and component materials. Such investigations should be done after corresponding recommendations of the 'GOST" to each kind of material and purpose of its usage.

Demands to the preparation of the test mockup for the future investigations of the fungal resistance should be discussed with mycologists in advance too.

The improvement of the standards especially for materials which will be used in different climatic conditions is the separate urgent task for aircraft building in Ukraine at the moment too. It includes as search of appropriate test-cultures of filamentous fungi for investigation of fungal resistance as search of biocide peculiarities of various materials.

System of the investigations of the products and materials on fungal resistence in Ukraine is in urgent need of unification and stardardization. Only special strains of the fungi-destructors, selected from corresponding materials and with confirmed destructor peculiarities, should be used for such purposes.

The problem of biodeterioration of manufactures and matherials should be solved by joint efforts of specialists in chemistry, material science, mycologists and microbiologists.

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V. I. Karpenko PhD.,
V. V. Kozlov PhD.
(National Aviation University, Ukraine)
L. P. Golodok PhD
(Dnipropetrovsk National University, Ukraine)

THE ASSESSMENT OF GENERAL SCHEMES OF BIOGASGENERATING UNITS FOR THE RECEIPT OF FUEL

The world tendencies of receiving biogas as fuel have been considered. There has been developed a biogas generating system that is viewed as a complex multilevel system that is intended for :- receipt of combustible gas up to the characteristics of car fuel;- utilization, detoxification of organic, domestic (communal) wastes including hard domestic wastes, wastes of farming and food industry and various organic-mineral biomass. The schemes of the biogas generating systems have been presented and analysed.

World level of solution to the indicated problems.

A Biogas generator is an impermeable container, where the process of organic substances fermentation to methane is provided by the methanogenic association of microorganisms in anaerobic conditions.

Technical solutions for the construction of biogas generators (methane-tanks) are known from ancient times. Systematic scientific researches of biogas began in XVIII century of our era.

The first scientific explanation for the appearance of inflammable gases on the bogs was given by Alexander Volt in 1776, when he defined the presence of methane in bog gas. And after the discovery of CH4 methane chemical formula by Dalton in 1804, the European scientists made the first steps in the research of biogas practical application.

Nowadays there exist constructions of different types of biogas units (gas generators) ranging from simple ground and movable ones of small capacity to complex generators with large capacities and productivity, that power heat generators and electro generators. Only in China their quantities reach 40 million.

In other countries, for example, in Europe there exist hundreds of thousands of biogas generators. At the same time, there is a number of problems caused by the nomenclature of organic substances for biogas generators, the concentration of the mixture made from these substances, the temperature regime, the time it takes to get a generator started, the duration of work, the preparation processes, loading and unloading, productivity, the cost of the received products from these biogas units and so on. Therefore constructing biogas-producing stations is of crucial importance and needs further research, taking into account the requirements of consumers in the domestic market of Ukraine.

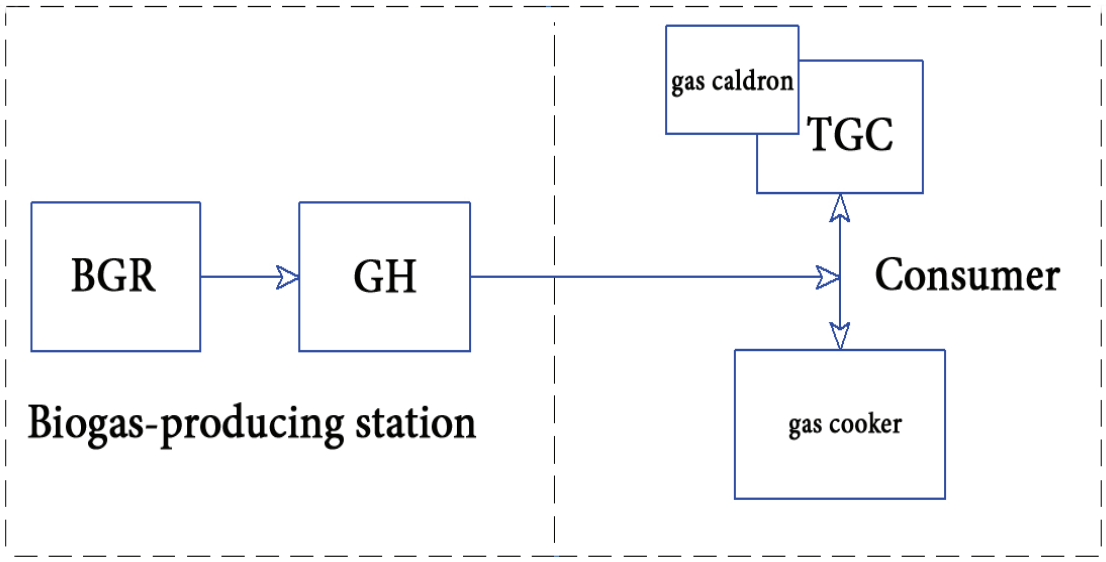
As biomass it is possible to use organic wastes of agricultural production, food, woodworking and other industries. Together with a biogas after the completion of fermentation we always have remains (sludge) that are a no less valuable product – a natural organic disinfected fertilizer. Another important reason for the use of biogas units is the absence of environmental contamination. All of it needs to be taken into account while determining the efficiency of biogas generating units application.

Different types of organic wastes give different output of biogas. The experience of previous researchers and our experience show that the productivity of biogas generating units is influenced by the type, composition, state and temperature of biomass, illustration 1 [1]. The speed and scale of anaerobic fermentation of methanogenic bacteria depend on their metabolic activity. Two temperature values of 33 and 54^{o} C appear in different works. These temperatures correspond to the highest metabolic activity and this activity almost fully stops at the temperature of 15^{o} C. In addition it should be mentioned, that the amount and composition of gas that is received after complete disintegration of biomass depends on C:H:O : N correlation in the biomass.

Among the most important substances of which biomass is composed, fats give the largest output of gas with content of CH4, proteins give a little less, and carbohydrates give even less than proteins. For

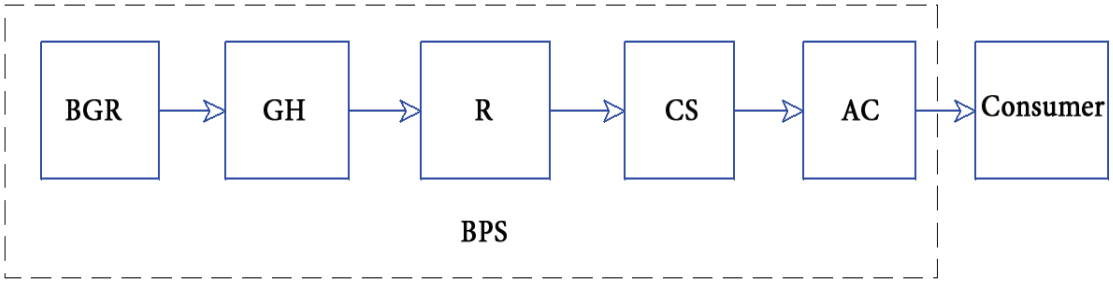
maintaining active metabolism and high speed of biochemical processes in biomass it is necessary to provide the maximally possible size of bordering surfaces between hard and liquid phases, i.e. their interfusion. It is known [1], that from biomass at a temperature of 32° C in a gas-generating unit it is possible to receive 0,8 - 1,0 м^3/kg of mass that has fermented, or 0,4 - 0,6 м^3/kg of the initially put mass.

For the receipt of biogas different technological schemes of biogas-generating units are used: those with the continuous system of loading-unloading, an those with the discrete system of loading-unloading. At a continuous technological process the highest productivity is reached, when there is an accordance between the added biomass and the available at that time substrate obtained after biomass decomposition. Such technological process is characteristic of large high-performance industrial units. In small and middle farms, and private houses the discrete systems of loading-unloading of organic matter are used (Ill. 1 – 3), where BGR is the biogas reactor; GH is the gasholder; GB is the gas boiler; TGC is the thermal gas convector; GC is the gas cooker; CB is the cleaning block; CU - is the compressor unit; AC is the accumulator; MCGCS BCI - is the motor-car gas compressor station of block-container implementation; BPS - is the biogas-producing station.



Ill.1. The scheme of the biogas-producing station for the consumers of biogas in a communal sector in small volumes, up to 6 m^3/ day.

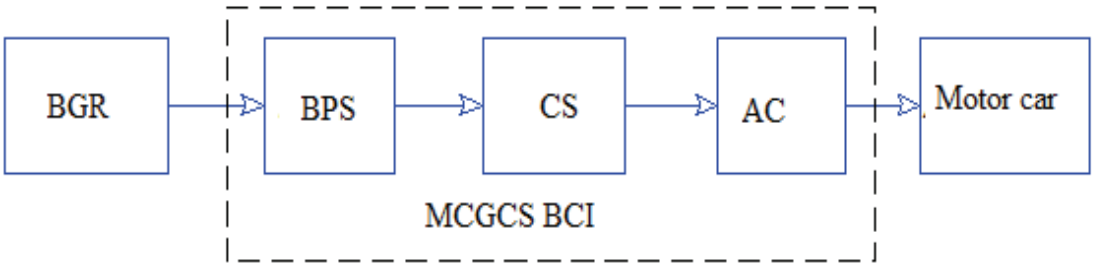
It is the simplest scheme, where the biogas-producing station consists of two parts – a biogas reactor and a gasholder, and the consumer of biogas is a gas-stove, or a gas-stove and a thermal gas convector, or a gas-stove and a gas boiler. For such consumers the productivity of the biogas-producing station is within a few m^3/day at surplus pressure of 1 to 100 kPa. The benefits of such scheme are its simplicity, insignificant cost, short term until it pays off, small cost of materials, and small sizes. The disadvantage of this scheme is the insufficient productivity of BPS in an autumn - winter period due to the consumption of gas to satisfy the needs of the BGR.



Ill.2. The scheme of the biogas-producing station for the consumers of biogas in a communal sector for covering the maximum consumption in an autumn-winter period.

A more complex BPS of a greater productivity is presented here. It allows to accumulate biogas for covering the maximum consumption an autumn-winter period. Such possibility is provided by including a compressor unit with a gas accumulator in the composition of BPS.

In a farm to the above mentioned consumers of biogas it is possible to add motor-vehicles and tractors, or electric generator with a gas engine drive (= gas engine gear). And therefore a third scheme is proposed (Ill.3). It differs from the previous one in terms of a much higher productivity and the fact that it has a separate module – an automobile gas-filling compressor station of a block-container type (Ill.3).



Ill.3. The scheme of the biogas-producing station for the consumers of biogas with a higher productivity and the separate module of the automobile gas-filling compressor station of a block-container type.

Both the compressor unit and the volume of a gas accumulator are selected depending on the levels of gas consumption. Automobile and aviation compressors of small productivity and power are used as compressor units for these biogas-producing stations.

The biogas-producing station that has been developed by us is viewed as a complex multilevel system that can provide utilization and detoxification of organic, domestic (communal) waste including hard domestic waste, farming and food industry waste, and various organic-mineral biomass.

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M.M. Aliiev
PhD in political science,
associate professor of international information department
(Institute of International Relations
National Aviation University. Ukraine)

TRANSFORMATION OF TRANSPORT EU POLICY IN THE POST-BIPOLAR PERIOD

The article deals with problems of EU's transport policy formation in the new political conditions. Great attention is paid to the evolution and main stages of transformation of a common transport policy. It is covered the influence of political factors on the formation of the EU's common transport system. The role of international transport corridors in the formation of a common EU integration space is demonstrated.

The collapse of the bipolar system of international relations coincided in time with the formation of a powerful center in Europe. Formation of the EU as a new actor on the international arena marked the beginning of a new intergovernmental relations system with reorientation from the global to the regional level cooperation. New historical conditions forced the EU to transform its own policy in all areas. One of the most important sphere is transport industry, that reflects the main values of unification: free movement of people, goods and services.

EU transport policy is an important constituent element of the political establishment existence. Among the priorities of the industry is second one after the development of the energy program of integrative education. Effective development of a European transport system became another important integration factor that should be considered.

Research of nature and problems of a common transport policy formation in the EU was dedicated works as domestic and as foreign scholars and practitioners. Among them can be divided into research and development VY Ladvischenko, A. Makarenko, PS Dedkov, T. Shaldenkova, Y. Shelistov, O. Martianov, A. Hahlyuk, YI Septilko.

The purpose of the article is to determine the nature and specifics of the of EU transport policy formation, taking into account political risks and challenges caused by the formation of post-bipolar system of international relations.

The purpose requires formulation of the following tasks:

- to define the conceptual basis of the EU transport policy;
- to trace the evolution of the main stages of the EU common transport policy;
- to analyze the political problems in the way of international transport corridors creation and outline solutions;
- to identify the impact of the integration process initiated by the EU on the development of transport infrastructure of CEE.

Transport sector in a common economic and monetary union develops on the base of the next conceptual principles. First, transport – it is the way and condition of economic freedoms realization in the EU, the method and condition of providing of unlimited mobility production factors, goods and services, and population displacement. Second in the modern conditions transport and communication are considered as strategic sector, that make an influence on the development of agricultural, industrial and trade policy. Thirdly, security and diversification of energy transportation are the basis of foreign policy of European states, their guarantee is in the priorities of modern agenda. Fourth, an efficient transport system is the powerful integration factor that unites the "new" and "old" area of the new Europe in a common space.

However, in the way of formation the EU transport policy has past a series of stages that define the current state of the communications sector in Europe, because it is political factors became significant in the unification of the European space.

The transport sector reforming of Western European countries at the beginning of the organization existence had many problems. It called for regulation at the turn 1950/60-th, when

there were created only created the basic principles of top six countries cooperation in Western Europe. Later transport became so-called "sectored" policy of the Community. Transport was conceived as a policy of the Commonwealth aimed at actual replacement of the national mechanisms of regulation. However, despite the fact that already in the Agreement about European Union in 1957 there was a special section "Transport", the work is not fastened [5].

In 1961 a Memorandum of common transport policy, which was proposed by the Commission determined that its goal was to create the open competitive market of transport services. In 1973, the Commission granted to the Council of Ministers program of common transport policy development. The focus of the problem were the improvement of transport infrastructure, increase of transport safety, reduce of costs. However, the Council of Ministers has not given official approval and continued to report only on proposed topic.

In 1983 the Commission published a new document that defined the main of the principles of transport market creation in the EU. In the same time the European Parliament and the Commission filed suit to the European Court against the Council of Ministers, pointing to the large gap between the objectives formulated out in the Rome Treaty, and minor achievements in the transition to the common transport policy.

In 1985, the European Court expressed support of the Commission position and ruled that any company in the EU is free to carry cargo and passengers in a common market. It was prohibited the discrimination on the basis of country of origin or country of destination. This authorization actually meant the beginning of the common transport policy.

In 1985 the Council of Ministers announced that by the end of 1992 would be liberalized traffic and implementation of measures for the harmonization of transport policies. After 1992 program were adopted the major decision (in 1988 and 1990), which regulated the freight transport market EU. Companies that have a national license for transportation were permitted to operate throughout the EU.

The next important stage in the development of transport policies associated with the adoption of the Common European Act in 1986 that provided the necessary acceleration of the transport market, reduce bureaucratic constraints, increased competition in the market. As a result, there were increased efficiency of the economy, quality of service, safety and level of comfort for passengers. Among the concrete results of common transport EU policy can be identified the termination of Eurotonnel construction and creation of high-speed trains [11].

The changes that took place in the world in the early 90 the XX century, collapse of the Soviet Union and, therefore, the collapse of its economic component - CEA, led the European Union to produce a new policy, particularly in the transport sector. Countries of the former Soviet camp showed great interest in establishment of close relations with the EU, thus demonstrating the change in political and economic priorities, so the transport industry had to adapt to new political realities.

90 years of the XX century were crucial for the European transport for many decades before. Creation of international transport corridors (ITC) and the continuation to the east were the necessary precondition for prerequisite for the integration of CEE states into the EU.

However initiator of creation of new transport corridors was not the EU but UN. In the mid 80-ies of XX century. Committee of the UNECE Inland Transport initiated a study to analyze the traffic flows between the Nordic countries and Southern Europe to use for the development of transportation in this area intermodal approach. Were considered road and rail transportation in countries that gravitate to this transport corridor (Sweden, Denmark, Germany, Poland, Czech Republic, Slovakia, Austria, Switzerland and Italy). Later the EU on the "leading role" in the part relating to corridor issues, released [5].

The next stage of the EU common transport policy, is started in 1992-93, in the terms of institutional formation of the Union. Creation of a common economic space and provides the presence of a common market of transport services and it has become a main objective of EU transport policy. The basic principles of policy in the post-bipolar period were liberalization and harmonization. The main goals were formulated in the first "White Paper" issued by the European Commission in 1992 and in the Program of Action in Transport sphere for 1995-2000 adopted in

1995 Among them there are the following: "double integration" of national transport networks and the various modes of transport to create a common European transport network, improving of EU transport infrastructure; large utilization of energy-saving and environmentally friendly transport modes, improving transport safety, transport policy integration in a common internal market, development of transport links with third countries [9].

To solve the set of ambitious objectives the EU has developed the projects of pan-European transport corridors (Pan-European Corridors) – as a part of the Trans-European Networks (Trans-European Networks (TENs). They were created for Central and Eastern Europe, among the candidate countries for accession to the European Union [7].

In 1993 there was a White Paper of the European Commission on economic growth, which was given a program of investment in major infrastructure projects (so-called Delor's plan). In June 1993, the large-scale plan was considered at the summit meeting in Copenhagen. Later Delor's plan was discussed at the next EU summit in Brussels in December 1993. As a result of meetings were marked the financial problems, so were decided to review the list of priority projects towards their reduction. Out of 40 initial transport projects were remained 14 on the list. They were divided into primary and secondary, and the criterion was readiness and feasibility of the project rather than its value for Europe.

In December 1994 in Essen (Germany) took place working group meeting, which was finally approved 14 projects of a pan-European transport network in total cost, as expected, 100 billion ECU. Construction of all these projects was concerned the only Western European countries [9].

The main principles of an international transport network creation were more fully established in Declarations of the First (October 31, 1991, Prague), the Second (14-16 March 1994, Crete) and the Third (23-25 June 1997, Helsinki) Pan-European Conference on transport, which became significant stages of a modern transport system in Europe creating [5].

All documents indicated that the success of European Union integration process of the new state-members will largely depend on the expansion and modernization of their transport network. This aspect creates the demand of development long-term investment program that would identify the priority projects of transport infrastructure, projected lost and future investments.

At the Second Conference on Transport in 1994 at Crete the Plan for a 10 trans-European transport corridors creation has been designed and approved. In 1997 at the Third Conference on Transport the Plan was improved. These corridors will connect the Central, Eastern and Southeastern Europe states among themselves and with the "old" EU member states. However there were designed wider plans for improving transport infrastructure in Eastern Europe.

The projects of the new transport corridors were titled by the location of this Pan-European Transport Conference (Crete). In general, the new corridors will cross the borders of the Eastern European states including Russia and Turkey. 10 Crete corridors covering the entire Eastern Europe, including 20 thousand kilometers of railway lines, 18 thousand km of highways, 38 airports, 13 seaports and 49 river ports. The development and modernization of such large-scale complex infrastructure to 2015 will need to invest about 100 billion euro, the sum is equal to necessary for the TEN 14 projects implementation [5].

The main projects of international corridors were proposed in 1994, but since the EU transport sector has undergone significant changes. According to this appeared necessity to develop new recommendations. That's why was issued the new document so-called "White Paper - European transport policy until 2010: time to decide", adopted by the European Council in Gothenburg in June 2001. In mid-December 2001 the document was agreed by the Council of Transport Ministers of the EU at the meeting in Brussels [12].The issue of "White Paper" regularly delayed because of lack of consensus on the priority tasks of transport policy. As a result, the document became an important political decision, it will serve the basis for the legislative activity of the EU in the transport sector for many years. [12].

The provisions of the "White Paper" were reflected in the second set of the EU directive, which supports the principles of interoperability and proposed to start cargo carrying by the common European network before March 2006, what is ahead of schedule (2010). Another

important point in the documents is creation until 2004-2005 of the European Railway Agency to convert the directives of the interoperability and security [2].

However, due to the expansion of Community, international transport corridors crossed the EU borders to third, and in this context, the EU must fundamentally re-evaluate the existing system of transport corridors.

In February 2009 Commission issued the Green Paper «TEN-T: policy review." Towards a better integrated trans-European network to serve the common transport policy." The document aims to regulate environmental issues, security and improving connects with the EU states neighbors. The other point indicates the necessity of the TEN-T projects modernization. The Green Paper aimed to adapt projects to modern EU needs considering its expansion in 2004 and 2007 and possible further adoption of the new states members [9].

The next stage of a common EU transport policy creation was in March 2011. In the context of EU transport policy development was issued the new document White Paper on transport – Roadmap to a single European transport area – Towards a competitive and resource-efficient transport system. In this document the basic objectives of the EU common transport policy by 2050 were pointed out. This is the third White Paper on common transport policy, since the signing of the Maastricht Treaty in 1992. The White Paper in 2011 takes into account the EU needs after enlargement, restoration of social and economic growth in EU after the crisis, reducing dependence on traditional transport fuels and reduce carbon emissions [6].

The external component of EU transport policy is detailed in published in July 2011 the European Commission document "The EU and its neighbouring regions: A renewed approach to transport cooperation " The main declared goal of EU cooperation with the state neighbors in the transport sphere is harmonization of transport policies and the markets integration [10].

In October 2011 was held a presentation of the project of updated guidelines for "Trans-European Transport Network", which defines the principles of further development of the EU transport network and prospects of its extension to neighboring regions. It is assumed that the development of EU transport system will take place in two stages: up to 2030 should be completed the construction of "core" network and by 2050 - "general" network. Updated guidelines for TEN-T are also present route of the EU transport network - 10 transport corridors which will promote the coordinated development of infrastructure [6].

Conclusions

Having conducted a detailed analysis of the political aspects of the EU transport policy transformation in the new historical period the author can propose the following conclusions:

1. EU transport policy reflects the basic conceptual values and norms which are the basis of this integration union. Efficiency, economy, integration dimension, safety and environment of transport are the priority factors for the EU and they reflects both the conceptual documents and everyday practice.

2. The EU has passed a number of sophisticated institutional steps to produce a common effective transport policy. This process has not ended, and received its logical extension to 2050 with the new developed documents.

3. In the current economic crisis, the EU faced a number of political problems in the process of creating of a common transport system and the solving of these problems is also in the political sphere.

4. The impetus for creation of the Pan-European transport corridors modern system in post-socialist countries was the collapse of the USSR, the need to deepen economic cooperation and integration processes initiated by the EU, which became an example of interstate cooperation.

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V.O. Chmelyov
Ph.D., Associate Professor
(Institute of International Relations
National Aviation University, Ukraine)

ROLE OF STRATEGY OF NATIONAL SECURITY OF THE STATE IN SYSTEM OF THE INTERNATIONAL RELATIONS

In article the role of Strategy of national security in system of the international relations on the basis of the analysis «Strategy of national security» 2002 and 2010 in the USA, «Strategy of national security of the Russian Federation till 2020» is investigated.

Strategy of national security rather new phenomenon in the sphere of state managements. There is a question of its role and value in the course of interaction of the international subjects. It is necessary to be defined, the document «Strategy of national security» is the instrument of coordination of activity of state bodies, or it is the instrument of realization of foreign policy.

Special value in the international practice of public administration strategic planning was extended in the USA. «Strategy of national security», published by the White house, is a fundamental doktrinalny document in which the administration of the USA states for internal audience and world community of the purpose, a task and methods of their realization concerning questions of the national and international security. For the first time such document was published still by Richard Nixon's administration. In 1986 Goldwater-Nikolsa law which, in particular, made preparation of «Strategy of national security» obligatory was passed [1].

Under the law, the U.S. President is obliged to represent regularly to the congress the report on realization of strategy of national security in which the military-political situation is analyzed, problems of the state on the international scene are formulated, government activities are determined by neutralization of external and internal threats.

As a whole, the political team which was in power develops strategy of national security as the doctrine expressing it political will and ideology. This document provides realization of a target approach in administrative activity of all state authorities, that is continuous orientation to the end results. «Strategy of national security» is a basis of the American military-political course. The document such, naturally, has declarative character, contains streamline, diplomatic formulations and doesn't open completely many aspects of real policy which remain the confidential.

The historical analysis of foreign policy activity of the government of the USA allows to reveal characteristics of approaches of formation Strategists of national security.

When electing the president from republicans in the management of questions of national security leaders of a business community, the former highest military ranks and known scientists-foreign affairs specialists (G. Kissinger, A.Kheyg, J. Shlissendzher, K.Pauell). Distinctive feature of republican administration is the rigid realism, and the doctrine of the national interests giving the expressed priority to external, instead of internal affairs, is guided by use of power tools, support of allies and elaboration of such strategy which purposes can be executed.

Democrats are distinguished by liberalism, especially concerning economic and social problems. Interests of various groups of the population supporting democrats (small farmers, the Jewish associations, natives of other countries, lawyers and journalists) differ from each other, than interests of the groups supporting republicans more. In administration of "democratic" presidents scientists, lawyers, politicians from the Congress (the Village Vens, Z.Bzhezinsky, E.Leyk, M. Albright, S. Talbott) are appointed [1].

Let's in details consider «Strategy of national security» presented by U.S. President Dzh. Bush Jr. in 2002 (further Strategy 2002) [2]. Which, as the justification having events on September 11 2001y. and war with the international terrorism, proclaimed the right of the USA to «preventive defense», actually the right of attack to the country, threat (real or imaginary) safety of the USA and their allies from where proceeds. Invasion into Iraq in the spring of 2003 and its occupation at

the actual ignoring of the United Nations and even a number of allies on NATO became an evident illustration of the doctrine of «preventive attack» [3].

It is possible to allocate the main directions of formation of Strategy 2002:

First, - aspiration by means of a military and technical superiority to guarantee inviolability of the territory of the USA, their allies, and also the American armed forces placed in various regions of the world, that is not only to protect itself and the allies, but also to provide realization of the global interests on a global scale;

Secondly, - expansion implementation for what are necessary increase in number of allies on NATO and neutralization of possible competitors.

The tasks listed in Strategy 2002, created in many respects under the influence of events on September 11, are continuation of the line of the period of Clinton in the conditions of active foreign policy approach of the USA: so strengthening of safety passed to fight for a new world order by fight against terrorists and tyrants (heads of "countries derelicts" mean); for assistance «to economic prosperity of America and a preservation of peace through establishment of good relations with great powers; democracy advance in other countries in expansion of a zone of the world through encouragement free also are open societies on each continent».

Essentially new moments of Strategy 2002 are: fight against terrorism; "justification" of the right to preventive strikes; active expansion of NATO to the east, to borders of Russia, at simultaneous declaration of the allied relations in fight against terrorism and refusal by it in membership in it the military block.

War of the USA in Iraq in the spring of 2003, the United Nations carried out without the sanction and at refusal in participation of a number of allies on NATO under a far-fetched pretext of existence of weapons of mass destruction, became a striking example of realization of Strategy 2002. But Americans had to wage expensive and bloody war with guerrilla movement and the terrorists who have appeared there that demanded long tension of forces.

Appearance of the new global enemy made the American foreign policy of more active, having provided in the opinion of the majority of the American citizens and a considerable part of world community the right to the most serious actions in fight against world terrorism that was used by Bush's administration for giving of new strategy of nature of global approach. In turn, this strategy (as well as previous) appeared is directed not so much on fight against terrorists and real military threats of the USA, how many on advance of their foreign policy and economic interests through maintenance of world leadership.

Let's consider "Strategy of national security" Presidential Administration of the USA of Barack Obama from democratic party (further Strategy 2010) [4]. On the Strategy 2010 accepted in May, 2010, it is possible to judge continuity and novelty degree in an approach of the relevant administration to safety issues of the USA.

In the new document four elements are allocated: safety; economic prosperity; advance of values; world order.

The main goal Strategy 2010 remained invariable - maintenance of the American leadership in the world, at the same time, has a number of differences. Into Strategy 2010 it is offered to integrate the main instruments of achievement of strategic objectives : diplomacy, military force, economic tools, investigation; forces of providing internal security.

Historically American approach to a problem of national security was limited to the international aspects – questions of military and foreign policy. Questions of domestic policy and economic development weren't considered relating to the sphere of national security of the USA. The present administration departed from such differentiation and expanded concept of national security to interrelation of internal state of the USA and its efficiency in upholding of national interests on the international scene.

Strategy 2010 defined reference points of foreign policy activity of the USA: «We will aspire to receiving broad international support, cooperating with such institutes, as NATO and the UN Security Council. The USA keep the right to unilateral actions if it is necessary to protect our country and our interests, but we will aspire to adhere to the norms regulating use of force», – is

told in new strategy. Thus, in new strategy possibility of Washington on unilateral military and power actions is left. Therefore Strategy 2010 in every possible way emphasizes that the USA intend to keep suppressing «a military superiority in conventional arms» (the superiority in nuclear weapons isn't mentioned) and will remain the unique power, capable to apply military force worldwide.

At the same time new Strategy 2010 refuses the thesis of Strategy 2002 about «global war against terrorism». Instead much narrower task – fight against "Al-Qaeda" and a network of her allies is put.

The special attention is given to interaction with the American allies – NATO countries (especially with Great Britain, France, Germany), and also Japan, South Korea, Australia, etc. It should be noted that in the document expansion of North Atlantic alliance and giving of NATO of global functions isn't mentioned at all.

However strategy of the President Obama admits that the number grows in the world new «the influence centers», with which USA it is necessary to cooperate. The list of these centers repeats in the text several times and includes China, India and Russia (the order remains all the time invariable that is rather interesting). Besides, «the influence centers» are mentioned regional. Among them – Brazil, Indonesia, South Africa, Saudi Arabia, Nigeria, Kenya.

The concept «the multipolar world» in new Strategy 2010 isn't used. It means that Washington passes from strategy of «the unique superstate» in the unipolar world to strategy of ensuring leadership of the USA in politsentrichesky system of the international relations.

Therefore was extremely precisely the position of the USA of rather Russian Federation is designated. To strategy 2010 it is told: «Actively achieving cooperation with Russia that she acted as the reliable partner in Europe and Asia, we will support the sovereignty and territorial integrity of neighbors of Russia». Thus, the prospect of the American-Russian partnership opens, but it is caused by behavior of Moscow on the former Soviet Union. Proves to be true that the USA don't intend to recognize independence of Abkhazia and South Ossetia.

The carried-out short analysis of Strategy 2002 and Strategy 2010 presented by the corresponding U.S. Presidents and the retrospective analysis of action of the government of the USA on the international scene showed high degree of correlation between the main theses of Strategy of national security and vectors of foreign policy of the USA.

Summarizing the foregoing it is possible to draw the following conclusion that the document «Strategy of national security» легализирует action of Presidential Administration of the USA for protection of national interests during the corresponding period of time.

Positive experience of the USA in the sphere of management of sector of national security, in communication by difficult dynamics of the modern world became even more widespread in the world. Documents on ensuring national security leave in Holland in 2007, Great Britain — in the 2008th and 2010, in Germany — in 2008, in Russia — in 2009. But it is necessary to notice that approaches to ensuring national security at each country are individual also the specific. Today the United Nations officially include 193 states, and them is conditionally admissible to divide into 3 groups: the early state — the developed state — the mature state [5].

In the mature states, the leader of group is the USA, the system of ensuring national security is harmoniously created, balanced and complete. The system is provided with consistent standard and legal base, to functions of system there correspond necessary structures, qualified personnel is prepared, there is a continuous improvement of methodology of definition of national priorities, an assessment and monitoring of threats, procedures of acceptance and implementation of strategic decisions. The system of ensuring national security of the mature states is provided with resources, strategic initiatives are considered when developing the budget of the state.

The system of ensuring national security of the developed countries where enter Ukraine, is capable to guarantee partial realization of national interests independently. It is connected with imperfect state system and limited resource ensuring activity of state authorities. And on the other hand, realization of these or those interests of the developed state occurs under the influence of the mature states, without crossing with their interests.

Rather early states, their system of ensuring national security has declarative character. Realization of national interests of such state occurs in conditions which created the mature and developed states, and under their complete control.

Example of interactions of the specified groups, the countries serve in the sphere of ensuring national security entering into NATO. Members of alliance form the national strategy they corresponded the Strategic concept of North Atlantic alliance accepted on April 24, 1999. Conceptual documents of the main members of alliance — the USA, Great Britain, France, Germany are indicative in this regard. The similar approach can be observed concerning documents in the sphere of national security of the states, in the immediate environment of Ukraine. Members of NATO: Poland, the Czech Republic, Slovakia, Romania, Hungary, Bulgaria, Turkey bring into accord parameters of national security with parameters of safety of North Atlantic alliance.

Let's consider the new phenomenon in the sphere of foreign policy of the Russian Federation. In 18 years after disappearance of the USSR there was a Decree of the President of the Russian Federation D. Medvedev No. 537 from May 12, 2009 «About Strategy of national security of the Russian Federation till 2020».

For the analysis we will take from a part «the II Modern world and Russia: a condition and development tendencies» separate points in which the position of the Russian Federation on the international scene is shined:

9. Transition from block opposition to principles of multivector diplomacy, and also the resource capacity of Russia and pragmatic policy of its use expanded possibilities of the Russian Federation on strengthening of its influence on the world scene.

13. On long-term prospect the Russian Federation will aspire to build the international relations on principles of international law, ensuring reliable and equal safety of the states.

For protection of the national interests Russia, remaining within international law, will pursue the rational and pragmatic foreign policy excluding expensive confrontation, including new race of arms.

Russia considers the United Nations and United Nations Security council as the central element of stable system of the international relations, at the heart of which - respect, equality and mutually beneficial cooperation of the states leaning on civilized political tools of permission of global and regional crisis situations …

16. The Russian Federation supports all-round strengthening of mechanisms of interaction with the European union, including consecutive formation of the general spaces in spheres of economy, external and internal security, education, a science, culture. Long-term national interests of Russia are answered by formation in Evroatlantika of open system of collective security on an accurate contract and legal basis.

17. Unacceptability for Russia of plans of advance of military infrastructure of alliance to its borders and giving attempts to it the global functions which are running counter to norms of international law remains defining factor in the relations with the North Atlantic Treaty Organization.

Russia is ready to development of the relations with the North Atlantic Treaty Organization on the basis of equality and in interests of strengthening of general safety in the Evro-Atlantichesky region, depth and which contents will be defined by readiness of alliance for the accounting of legitimate interests of Russia at implementation of military-political planning, to respect of norms of international law, and also for their further transformation and search of new tasks and functions of a humanistic orientation.

18. Russia will aspire to forming of equal in rights and high-grade strategic partnership with the United States of America on the basis of conterminous interests and taking into account key influence of the Russian-American relations on a condition of an international situation as a whole. As priorities there is achievement of new arrangements in the disarmament and control sphere over arms, a strengthening of measures of trust, and also the solution of questions of non-proliferation of weapons of mass destruction, strengthening of anti-terrorist cooperation, settlement of the regional conflicts» [6].

From presented the relation of the Russian Federation directly to policy of the USA is accurately visible, to NATO, EU then the chronological sequence is traced:

1. The decree of the President of the Russian Federation D. Medvedev No. 537 from May 12, 2009 «About Strategy of national security of the Russian Federation till 2020».

2. The government of the USA in May, 2010 published «Strategy of national security».

3. The government of Great Britain published on October 19, 2010 updated «Strategy of national security».

4. The Lisbon summit of NATO (on November 19-20 2010 roubles) where Council meeting Russia — NATO took place [7]. Prospects cooperation in areas where there are common interests (item 23 the Declaration of the Lisbon summit of NATO) were discussed [8].

5. Cooperation on transit of cargoes of NATO from Afghanistan for what the airport in the city of Ulyanovsk (Russian Federation), and the access tracks certificated for the international freight transportation will be used [9].

Thus, the hypothesis proves to be true that Strategy of national security is the information instrument of foreign policy activity which officially defines priorities of the international subject and positions it on the international scene.

Conclusion

As a whole, research of Strategy of national security of leading foreign countries in which positions are presented, priorities and the country leaders purposes, showed that the true purposes of the states are, as a rule, veiled and submitted to them in the generalized look, declared provisions only plan contours of real actions in the sphere of the international relations. However, the document Strategy of national security on the functions takes a special place and plays one of the main roles in the course of adoption of political solutions of any of the countries. The analysis of the specified document of one state or group of the interconnected states allows to predict prospects of development of the international relations, to reveal tendencies of their changes and to develop effective Strategy of national security of the state.

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Aiexander N. Goncharenko
D.Sc .(History of International Relations, Foreign Policy),
Professor, Chair of International Information, Institute
of International Relations, National Aviation University,Ukraine
President, Center for International Security and Strategic Studies.

PREVENTIVE DIPLOMACY AND ASYMMETRIC STRATEGIES IN THE INTERNATIONAL SECURITY POLICY AND ANTITERRORIST OPERATIONS

The report considers the possibilities and perspectives of preventive and asymmetric approach to the international security policy and antiterrorist operations. The special attention is paid to the problems of "preventive thinking" logic, role and limitations of liberal tradition and ethics in the modern diplomacy and international relations in a whole.

International terrorism together with the regional security challenges are today the major threats to European and transatlantic security. The strategic question of XXI century is whether the liberal democracy could control these threats, especially in the broad "arc of instability" stretching from Balkans to the Philippines.

Preventive and asymmetric approach to the international politics is extremely important today. It is a tool number one in the effective national and international security policy and conflict management. On the other hand asymmetric strategies always had been the "favorite instrument" for the international terrorists as well.

Preventive and asymmetric strategies have a lot in common. It is much easier to prevent the terrorist act or acute crisis than to manage them after they have escalated. No less important is the cost-effectiveness question: the budget of only one day of USA operation in Iraq or NATO operation in Afghanistan is roughly equal to this one of all UN peacekeeping operation worldwide for a year. Thus preventive approach implicitly corresponds to the demands of cost effective security organization. But the studies related to crisis prevention, preventive diplomacy or preemptive security contingency planning are still very sketchy and fragmentary.

From the other point of view it is quite obvious that prevention is the key feature of modern strategy. In the National Security Strategy of the USA a heavy accent had been made on the preventive measures and preemptive actions. "United States can no longer solely rely on a reactive posture as we have in the past… the United States will if necessary act preemptively" [1]. The European Security Strategy ("A Secure Europe in a Better World") especially stresses the necessity "to act before a crisis occurs. Conflict prevention and threat prevention cannot start too early" [2]

The idea of preventive strikes, including use of nuclear weapons against non- nuclear countries, presupposed in the open or restricted parts of new military doctrines of Russia (2010) and France.

Nevertheless the absence of system approach to the theory and art of prevention, lack of foresight and effective intelligence sharing in international relations and security policy, still prevail. The same situation exists in the sphere of asymmetric strategies - the favorite and very effective tool of international terrorism. International terrorism itself is a typical asymmetric ("not fare") response to what we usually elegantly call "the inequalities of contemporary world". Some more adequate words should be found for this appalling "inequalities". The international terrorism is only the first symptom of the inevitable conflicts of redistribution that expect the mankind sooner or latter. Something radical should be done here.

But the main problem of preventive and asymmetric strategies is that this approach objectively contradicts not only to the regulations of international law (we will speak about it latter) but to the basic principles of liberal tradition and ethics in general, including human rights and respect to human life. These principles regrettably are completely incompatible with the requirements of the *effective* security policy and war against terrorism. In more broad sense the question arrives about ability of liberal democracy to stand against new challenges in general and international terrorism in particular.The problem is aggravated with the helplessness and practical uselessness of international organizations. These organizations are ineffective and their decisions

are very often ignored, especially by the superpowers[3].

Moreover the passive, reactive approach to the mentioned above challenges is dominated today. It reminds the reaction of dead frog crucified on the laboratory table with two electrodes one connected to the leg and other inserted into the back part of the poor amphibian. If one switch the 100 volts battery to these electrodes the dead frog jerk its leg convulsively, if not - correspondingly not. This is the way of the dead frog, the way the majority of present day politicians react. They begin to jerk only when acute crisis began and bloodshed started. Only then they awake and try to do something and in result they are always late. Such purely reactive behavior in crisis management is aggravated by liberal pluralistic nature of democratic systems. What we need to cope with the present day's challenges is the future oriented thinking and active preventive way of action - in other words we need preventive forecasting and management. And the core of this management is the creation the network of early warning structures, sophisticated intelligence gathering systems, permanent flexible preventive forecasting. Not one time act, but regular activity that allows estimating and predicting the crisis dynamics, form the proper and timely correction signals. These signals should be accumulated and send through the back-loop channels to prevent the father conflict escalation, to tame the possible crisis. Simultaneously the development of prevention strategies, confidence building measures and peacekeeping should start.

This is the concept of adaptive management - the most effective tool of crises resolution. But true political will is needed here to take action before not after the crisis or conflict has blown up. Above mentioned early warning institutions and more "intelligence sharing" are necessary as well. But the existing structures and international organization are very bulky, inefficient and inertial**.**[4]

The absence of adequate network of early warning institutions is not the only problem of energy security policy and terrorist attacks prevention. The other fundamental problem is the luck of future oriented thinking in the international relations, outdated and overbureaucratised system of decision-making. In result the pessimists among the professional analysts are deeply convinced: even if timely early working information signals were send, they are never received in a proper way. If the signals were received they are never analyzed. If the signals were analyzed, they are never reached the end user (so called Decision Making Persons). If the signals were reached the DMP no timely decisions would be taken. If the decisions were taken they would never implemented into reality. And if even a miracle has happen and decisions were implemented, they were implemented in a completely different way they had supposed to be implemented.

The CIA met exactly this problem in case of *al Qaeda* terrorist attack in N-Y. There were the warning signals about attack, numerous signals and CIA had got them, but these signals had never reached the DMP and had never been analyzed property. As a result no preventive measures had been taken. In other words from pessimistic, skeptical point of view any attempts of terrorist attacks or conflict prevention are today mainly useless.

But let us try to be the optimists and speculate a little about general problems of crises prevention. Crises prevention is not universal panacea. Crisis in itself is an useful phenomena. The great philosophers from Heraclitus and ibn Haldun to Hegel repeatedly stressed that conflict /crisis is necessary precondition of the social development. There is no progress without the conflict/crises. In international politics the major danger of conflict/crises prevention and management especially in military interpretation is that it could undermine the basic principles of international relations, such as non-intervention and national sovereignty. It is highly possible that the major powers will misused the intervention and crises management to push forward they own selfish interests. The all national liberation and self-determination movements could be very easy proclaimed as terrorist organizations, threats to national and international security. Colonial war in Chechnya for example could be considered as honorable and legal anti-terrorist operation.

From the "preventive thinking" logic invasion of the Warsaw pact troops in Czechoslovakia in 1968 was only typical and very effective peacekeeping operation on the broad multinational base. Operation that had guaranteed the peace and stability in the region for more than 20 years. So it is obvious that prevention approach objectively have some limits and never should be used indiscriminately. From the other point of view there is no doubt that effective security policy and effective antiterrorist operations presuppose certain kind of intervention and preventive measures.

They are absolutely necessary even if they contradict to the classical principles of the international law. A lot should be done in this sphere. Under existing international law a state have no right for preventive, especially military operations on the territories of foreign countries without their consent. Even more up to now international community failed to elaborate generally accepted definition of terrorism.

Today international law experts debate three concepts that may serve as cornerstones for the global consensus in this sphere:

- the classification of terrorism as the human enemy of mankind;
- a renewed emphasis on sovereign responsibility as the corollary of sovereign rights;
- application of the logic of the inherent right of self defense to the realities of the 21st –century[5].

But the most important thing is to consolidate the understanding that UN Charter is not a suicide pact or the sacred cow and if the effective war against terrorism demands some changes to the international law – they should be made in the interests of all mankind.

Discussing the role of preventive and asymmetric strategies and its moral implications in the war against terrorism leading American strategist Colin Gray gives far reaching recommendations: "If there are cultural barriers on our side to incorporating particularly murderous options into the policy, strategy or operational intent, than we may need to reconsider some of our attitudes and rules of engagements." [6]

The terrorist as a rule prefer to use "dirty" asymmetric strategies. One of the most popular definition of asymmetric strategies (US National Defense University) is: "asymmetry is not fighting fair" [7]. In this situation "war on rules" with terrorism will never be effective.

The rules of engagements should be reconsidered. "All is fair in love and war"- wrote in his time William Shakespeare. No less radical were the representatives of other great nation: – "A la guerre, comme a la guerre". There are no alternatives to the broad use of preventive and asymmetric strategies in the security policy and antiterrorist operations . That while considering the role of these strategies not only from the point of view of liberal tradition and ethics but in the context of **9/11** events and their consequents, it will be very useful to remember the other great representative of European culture - Niccolo Machiavelli and his recommendations.

Adapting a little these recommendations to the present day situation we may stress: ***There are no moral or unmoral strategies in war against terrorism there are strategies effective and ineffective***.

Conclusions

Preventive and asymmetric approach to the international politics is extremely important today. It is a tool number one in the effective national and international security policy and conflict management. The main problem of preventive and asymmetric strategies is that this approach objectively contradicts not only to the regulations of international law but to the basic principles of liberal tradition and ethics in general, including human rights and respect to human life. These principles are completely incompatible with the requirements of the effective security policy and war against terrorism. The rules of engagements should be reconsidered.

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O.Yu. Kondratenko PhD of history
(National Aviation University, Ukraine)

FORMING OF FOREIGN-POLICY DOCTRINE OF RUSSIAN FEDERATION (1991-1996)

In a lecture the question of forming of the Russian foreign policy is affected in the first years of the post-bipolar world. In particular attention is accented on becoming and evolution of foreign-policy doctrine of Russia from pro-western onevectorial to multivectorial directions toward the countries of Eastern Europe, APR, countries of the third world and others like that.

Actuality of this theme grows on the measure of activation of influence of Russia as on regional so world levels. In this connection the foreign policy of Russia became the object of attention of representatives of different humanitarian directions. Looks out fully logical that most researches are in this context presented by the Russian historians, political scientists, sociologists and others like that. Home scientists, as a rule, touch the marked range of problems at studied the «Ukrainian question» in the foreign policy of the large states, or in the context of bilateral relations or multivectorial policy of Russian Federation. On the whole events in 1991 became a sign for an international policy and were related not only to disappearing of one from supercountries as global world center and by the change of balance of powers but also marked beginning of new model of intergovernmental relations. However, will mark that last which came on changing of Yalta-potsdamsky (bipolar) to the system until now did not get synonymous formulation and semantic filling. That is why there is a variety of terminology explanations, as then: «onepolarity», «polypolarity », «new bipolarity» and others like that. Pushing off from the last, within the framework of the article will try to find out how a new international model influenced on forming of the Russian foreign-policy doctrine.

Thus put before itself next tasks:

- to investigate essence of the Russian foreign-policy doctrine of first half 90th;
- to light up relationships of Russian Federation with the countries of the West;
- to consider relationships with the countries of post-soviet space;
- to expose relationships with the countries of Centrally-east Europe.

With disintegration of the USSR to the near-term tasks of Russian politics there was a hasty search of answer for a question in relation to the place of the new state in the international arena. The original illusiveness in political circles resulted in a volume, that in Russia to the end of 90th it was not mine-out to the mechanism of forming of only foreign-policy strategy. As known there were two contradictory interest of vision of foreign policy of Russian Federation groups: first from them, presented by conservative elites defended the idea of continuation of confrontation with the West and establishment of Russian control on the walks of life of the CIS; second which was laid down by the representatives of junior generation of politicians, came forward for adaptation to new realities of international policy and accordingly adjusting of relationships with leading democratic countries.

It is possible to assume that during opposing on set time advantage was scored a by the second interest group transformed in the so-called «doctrine of American central» - more known as a «doctrine of Kozyrev». Will name last consider unofficial, as a term was entered in a scientific appeal by the Russian political scientists for determination of quintessence of positions of the of that time Russian foreign-policy department headed A. Kozyrev. The last became the head of MFA of Russian Federation as early as 1990 and cherished the idea of speed-up integration of Russia to the western institutes of such as EU, NATO, AE. One of the first tasks there was a construction of democracy in Russia on a western standard, by priority in the relations Russia distinguished the USA and European Union created in 1992. The doctrine of A. Kozyrev supported by president B. Yeltsin became the actual reflection of moods of democratic forces, which only came to power and counted on rapid transformation of Russia from a «sick giant» in the prosperous state with a market

economy. In the first years new Russian politics aimed foremost to please to the West even by the cost of abandonment from the row of foreign-policy ambitions. On the other hand the foreign-policy aim of Russian Federation consisted in interallied support of initiatives of occident, by an example what the initial stage of the Yugoslavian conflict became. As asserts A. Bogaturov: «Refuse to Russia to support a central government in Belgrade against the separatists of Croatia and Slovenia was a surprise for many western diplomacies». About the friendly moods of Russia the words of B. Yeltsin certify in particular during a performance on the session of РБ of UNO on January, 31, 1992, which marked in particular, that: «…Russia examines the USA and other countries of the West not only as partners but also as allies». The words the leader of Russia confirmed and during the first acquainting visit to the USA in February of the same year. As a result of visit in Camp David by parties Declaration was signed «About principles of new mutual relations» where once again was uttered declaration that parties do not examine each other as opponents and obligated to co-operate in the name claim of general democratic values. Also there is sufficiently a strange idea of confluence of soldiery structures of the CIS and NATO confirmations of idea of interallied.

Will notice however, that the Russian democrats did not create something new, as this doctrine was essence by inertia continuation of Gorbachev foreign-policy thought of end 80th the result of which abandonment to the USSR from global opposition and beginning of rapprochement became with the West. Moreover, weakness of positions A. Kozyrev, which anything tried to do the vision of foreign policy of Russia official was obvious. The last was not cast aside in particular by the representatives of the American diplomatic elite. For example, the first deputy of U.S. Secretary of State 90th S. Telbot marked in the remembrances, that: «the most vulnerable from the ministers of B. Yeltsin was A. Kozyrev, as he presented a face and voice of that Russia which aimed to become part of the West». A. Kozyrev during private conversation during the official visit of state secretary of the USA of W. Kristopher tried to secure support last hinting, that in another case his place a less loyal west man can take them. At the same time the head of MFA avoided the public discussions of diplomatic questions during this meeting with the surroundings which served to absence of alternative of decision of row of problems. Such situation automatically converted the Russian diplomatic beau monde into the hostages of mood of the minister.

It is possible fully to assume that indemnification of loss of supercountry had to take place by gradual solicitation of confession of equality of rights of positions of Russian Federation next to the USA, as an idea of existence of only supercountry in obedience to this doctrine was categorically denied. One of the first such idea was expressed by B. Yeltsin logically coordinating her with foreign-policy institute. For this reason in basis of A. Kozyrev «American central» a thesis was fixed about as possible more rapid including of Russian Federation to the democratic club on the terms of equality with maintenance here of own face. The world associated new Russia from the USSR and considered it the competent heiress of the USSR, as: firstly, guidance of Russia was obligated to execute all previous international agreements celled to the USSR; secondly, Russia replaced the USSR in Security of UNO Council.

Pro-western position of Moscow resulted actually in forming of onevectorial strategy of foreign policy. One of the first documents, which regulated conception of foreign policy of Russian Federation there were sufficiently ambitious «Bases the conceptions of foreign policy of Russian Federation», accepted on April, 23 in 1993 Here speech went in the context of maintenance of foreign policy of Russia about participating of the state in forming of new world order on a background global calls and threats. Thus, without regard to the scale socio-economic crisis of beginning 90th Russia did a decisive statement about claims on the foreign policy of the large state. Moods of new elite with intensifying of the Russian socio-economic problems of beginning 90th or not better in all illustrates the known utterance of «West to us will help». Therefore aspirations to shut out the attendant of coil of confrontation with the West with that became an aim to foreign-policy conception: firstly, to have an access to the newest technologies, financial resources and world markets; secondly, to attract the investments of leading countries for the sake of assistance to national economic recovery.

However considerable part of that time experts in political discussion usually adhered to the that idea, that Russia is unable to apply on a role even regional leader at the terms of subzero competitiveness of economy. Exactly a crisis caused loud notes about international support the western democratic and financial structures (IMF, WB) of Russian economic reforms. With partial to sell off at the beginning of 90th stereotypes of aggressive empire of evil, an image of Russia in the world was fully positive which absence of direct enemies was also added to. It was desirable to believe in that in the military sphere of Russia and USA pawned bases of strategic stability an active collaboration. However with growth of asymmetry in relationships with the West, the first bluebell of which development of plan of expansion of NATO became east, illusions about a comprehensive help were quickly blown about, the doctrine of «American central» had begun to give a failure with the further loss of popularity. To it added and feature, that not all political circles perceived a pro-western foreign-policy doctrine unanimously. The first serious squall of criticism was predefined by the unsuccessful reformative measures of democrats. On the whole a new political elite over-estimated the role of solidarity with the West, and on the whole it was difficult enough to reconcile oneself to Russian society with the role of defenders of interests of yesterday's enemy as personified to the capitalism.

Separately it costs to mark that one of near-term tasks for Russia there was a collaboration from the USA in the field of control above nuclear armaments. In particular during the official visit of president of Russia to the USA in June in 1992 the row of directions of actions was certain in relation to a massive and global system of safety weapon in which one of leading roles belonged to Russia. Signing of row of documents became the result of meeting on questions, which de - jure confirmed intentions of expansion of further collaboration of parties. At everything at political elites as Russia so until now the complex of mistrust was kept the USA, as in one of documents - of «Charter of Russian-American partnership and friendship» quite nothing speech did not go about the union of partners, and word partnership practically was not used. Moreover in a preamble to Charter the original «code of behavior» was written for Russia, which she had to hold during realization of internal transformations for preparation to valuable partnership with the West. The last testifies that parties did not wish to force an event. The improvement of trade and economic relation became a certain positive between parties after an entry by virtue of agreement about the grant of the so-called mode of most assistance, however it meant complete abolition of amendment of Jackson- Vanik and Russia a right for such mode was given on a year with further continuation. Signing became a next positive moment in January in 1993 to Agreement in relation to further limitation of strategic offensive arms (START-2) to 35000 war-heads for each of parties. However and here it was not succeeded to avoid certain complications, as Agreement went into effect only in 2000 after ratification of CHO-by 1 Ukraine, Belarus and Kazakhstan.

Parliamentary elections of December 1993 and 1995, which resulted in the defeat of democratic and victory of nationalistic and left/antiwesternizer of forces represented the obvious loss of popularity new inwardly- and foreign-policy course. In the conditions of deepening of scale crisis given in signs and other destructive processes. For example, at the beginning of 90th opposition to the new foreign-policy doctrine was laid down by the representatives of ВПК, which required the increased attention from the side of the state, military powers of Russian Federation continued remained the so-called group of pressure and original argument of defending of national interests. One of explanations of it the factor of remaining inertia race of armaments of cold war which came to an end the day before can come forward. The doctrine of «American central», as well as at one time to Gorbachev foreign-policy thought, position of soldiery the basic task of which was see strengthening of army for the rebuff of credible aggression from the side of NATO or other opponent conflicted with. The like state of affairs foresaw a return to the policy of confrontation (though without development of scale conflict - *O.K.*) and proceeding in character of enemy of the West. Such patriotic position was formed mostly because of reformation (reduction) of army, that in turn threatened to the increase of number of unemployed due to workers MPC.

Except that active pressure grew from the side of provincial elites and Russian diaspora in the former allied republics. On the whole public moods all anymore specified on that the West is not

interested in the revival of strong Russia. The foreign-policy course of Russia became more vulnerable. The besides prevailing unipath of foreign policy in a considerable measure resulted in a loss Russia on set time of east vector of collaboration, including with such leading world centers as ASEAN, China, India, South Korea. On the eve of presidential elections in 1996 B. Yeltsin appointed as the minister for foreign affairs of experienced politic and scientist E. Primakov one of main tasks of which there was adjustment of foreign-policy doctrine of Russian Federation. That he suggested to give up two postulates of the predecessor - second-rate role/of role of «cadet» of Russia in relationships with the West and onevectorial her foreign policy became the merit of new minister. Among own initiatives E. Primakov it costs to distinguish unacceptability of expansion of NATO due to the countries of former OWA (what threatened in turn approaching of Alliance directly to the borders of Russia - *O.K.*) and idea of realization of integration processes of the CIS on different speeds, depending on readiness of members to the deep level of collaboration.

Following among main priorities in realization of foreign-policy doctrine adjusting of amities became Russia with the countries of the former USSR as sphere of her life- important interests. Thus Russia expressed the special rights on territory of space of the former USSR, wanted the regional guarantor of safety on a role. The last in particular was written in the mentioned «Bases of conception of foreign policy of Russian Federation». After disintegration of the USSR contradictions grew in the relationships of Russia with post-soviet countries in the context of problems of division of property, question of borders, settling debt, especially sharply the question of the Russian diaspora of placed stood on all territory of the former USSR. The Post-allied republics along from a full scale collaboration with Russia gave priority to strengthening of own sovereignty, were disturbed by own national safety and searched defence in the different regional measuring. Already in 1992 Russia forced was to correct the foreign-policy doctrine in relation to post-soviet countries in accordance with statements about the aspiration to take part in foreign-policy businesses. Any attempts to strengthen influence of Russia on post-soviet space considered on a west as a display of neoimperial ambitions. Therefore the primary objective of Russia was abandonment from the traditions in a foreign policy for the sake of maximal realization of policy of neighbourliness end-point of what forming of loyal belt of countries became due to post-soviet space. In conception of project of foreign policy geared-up at the end of 1992 a priority place in external relations was taken exactly post-soviet space as zone to the exceptional «affected of Russia zone». Soon A. Kozurev marked about the first successes of dynamism in this direction, which agreements became about an only defensive, single military-strategic space and forming of the system of socio-economic connections. The duty page of relations of Russia with post-soviet countries was opened by Decree of President the «Strategic course of Russia with the states-participants of the CIS» on September, 14 in 1995 This directive as direct expression of maintenance of national interests of Russian Federation on territory of Concord in economic, military-political, humanitarian and safety spheres, marked maintenance of integrity of space of the CIS foremost. At the same time, document in basis which on the face of it is fixed balance of mutual compromises, essence of priorities of relationships passes with these countries as special zone of interests of Russia, the primary objective of policy of which was the further forming of more national association under an aegis Russian Federation.

For Russia up to a point it is possible the positive result of this course to count creation of the CIS from December in 1991 and transformation on his sloes of different integration educations like the Customs union, EES, Eurasian Union and others like that. It is however possible to consider beginning of forming of association of Russia and Belarus most success of Russian diplomacy in April in 1996 the Such deep political and economic integration two held on the walks of life the CIS must put beginning of forming of new more national education as a valuable subject of international relationšof. However relationships of Russia with other Slavic blood brother-Ukraine were distant from ideal, to what permanent discussions testified concerning distribution of the black Sea fleet, demarcation of intergovernmental borders, power contradictions and others like that.

The third important direction of the Russian foreign policy was sent to maintenance of friendly relationships with the countries of the so-called second belt - Centrally-east Europe and

row of countries of Asia and Africa. About importance of maintenance of strategic relationships with the countries of this group Russian guidance marked repeatedly. However the east Europe countries, ridding of long-term communist yoke quickly remove advantage to the collaboration with Western Europe and USA, and also integrations to the euroatlantic structures. At everything Russia was not able to offer to these countries of some more attractive initiative, to prevent or somehow postpone entering of former members of ОВД into NATO in which the last continues to see a threat for own national safety. By virtue of that until now fresh were in folk memory the Hungarian and Czechoslovak events the collaboration of these countries with Russia of beginning 90th was erected practically to the minimum. In February in 1994, when intervention of NATO took place to Bosnia as in the international arena so in Russia criticism developed in relation to inactivity of B. Yeltsin and A. Kozurev. However though as to influence on a situation (on none of parties) which was folded on the walk of life of former Yugoslavia Russia did not could then.

All attempts to compensate the «loss of East» due to adjusting of relationships with Iran, did not bring to Moscow of the expected result. Moreover, in Russia considerably relationships became worse with the traditional allies of the USSR on Near east as then: Iraq, Syria, Libya. In connection with such situation already from 1994 B. Yeltsin was all anymore predisposed to the search of alternative to the one-sided concessions, casting aside the idea of prelude of «western club».

Almost fully there was a convolute collaboration of Russia with the countries of the «third world» mostly due to advantage of western vector of foreign policy, and also in connection with absence in Russian Federation of sufficient resources on maintenance there of the presence. In addition, Russia forced was to go on rolling up of the policy in these countries in order to avoid an unnecessary rivalry with the West which also had the interests in this megaregion.

Will add and that condemning a top management and forbidding «squandering of national property» began a process to arrangements of Russian life in a greater degree. The former Asian, African and Ibero-American brothers on socialistic camp were surprised by such sharp foreign-policy turn of Russia which now came forward for payment to her of debts and called to follow the example of «overthrow communist to the load of the past». In the total these countries quickly enough displaced the former scales of collaboration with Moscow. To compensate the «loss of the third world» Moscow tried due to economic penetration in countries which develop mostly due to the supply of weapon.

Separately it costs to mark about interests of Russia on Near east. In the first half 90th Moscow tried actively to settle more close relationships with Israel as by the nearest partner of the USA in a region. However Israel avoided direct partner relations with Russia, limited to the collaboration with the separate groupments of patriotic forces of Russia of different directions. Also from 1992 a desire to renew the lost positions on East in connection with an increase in the international arena of political role of ATP showed up at Russian diplomacy. For this reason A. Kozyrev periodically declared that Russia not must be oriented exceptionally westward, but to go there where she have the interests. After it, as political scientists assert, Russia directed the foreign-policy vectors at first on a north and South, and in the end and east. At everything the evolution of the Russian doctrine of foreign policy consisted of the embryonic stage her basic task as yet there was a change of essence of soviet multivector at accordance with new requirements. On the way of realization of key moments of the Russian foreign-policy doctrine it arose up row of obstacles one of which First Chechnya war became 1994-1996.

Conclusions

Thus after the crash of bipolar structure of international relations Russia remained one of the large states, however had such international influence as it was in the days of the USSR. With disintegration last to Russian Federation though inherited 75% territories, however lost considerable socio-economic potential, and her foreign-policy resources were considerably limit. For valuable partnership of Russia from the USA sufficient political and economic grounds were not enough and she was forced to agree to the role of cadet. Aspiration in spite of everything to do the western vector of the foreign policy leading often took place due to the loss of interests in other directions.

The attempts of Russian Federation to hinder to expansion of NATO east and to prevail on post-soviet space were considered in the world as steps to proceeding in an empire, that braked Russian rapprochement the same with the West. The overpriced expectations from the last quickly enough resulted in the loss of popularity and rolling up of policy of American central. Such state of affairs assisted optimization and construction of more pragmatic foreign-policy course of Russia.

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V. Kubalskiy, candidate of legal sciences,
(National Aviation University,Ukraine)

PROBLEMS OF INTRODUCTION OF CRIMINAL RESPONSIBILITY FOR ILLEGAL ENRICHING

A question is investigated about admission and expediency of revision of maintenance of principle of presumption of innocence in connection with introduction of norm about the illegal enriching in the Criminal code of Ukraine.

The problems related to addition of criminal law the article about the illegal enriching were studied in scientific works of L. Brych, O. Dudorov, M. Melnyk, T. Tertychenko, V. Tyutyugyn, M. Khavronyuk, O. Shemyakyn and others. Among the russian specialists its need to distinguish O. Alekseev, G. Bogush, V. Borkov and V. Luneev. The article also is base on scientific works of specialists in criminal process – G. Yudkivska and V. Kryzhanivskiy, that studied principle of presumption of unguiltiness in practice of European Court on human rights and legislation of the foreign states. The scantily explored was remained by the question of revision of maintenance of principle of presumption of innocence in connection with introduction of norm about the illegal enriching research of that and is the aim of the real article.

A concept «corruption» in a criminal law foremost characterizes the actions of official persons, that practice upon power or official position with the aim of the illegal enriching [1, 32]. The illegal enriching comes forward as an aim of any corruption crime. A legislator in 2011 entered in the Criminal code of Ukraine article 368-2 «illegal enriching». Thus, with the aim of strengthening of counteraction to the corruption Ukraine perceived recommendations of the UNO and CE, entering separate criminal responsibility for the illegal enriching.

The criminal methods of the corruption enriching in most cases are already embraced by the signs of crimes, provided Criminal code: receipt of bribe (article 368), appropriation, peculation of property or pernancy by him by cumshawing (article 191) and others.

Traditional approach at that a corruptioner is attracted to criminal responsibility mainly for a bribe must gradually step back in the past. In understanding of V. Borkov, new approach must be based on three borders of criminal law counteraction to the corruption. The first border can be shown in criminal prohibition by separate criminalization of corruption plot of official with other person. The second border is formed by norms about corruption crimes. The third (last) border provides establishment of criminal responsibility for the illegal (corruption) enriching. A similar norm that is constructed on the basis of side signs of corruption it is accepted to examine as a force reaction of the state on increase latentness and danger of corruption crimes [2, 18-19]. In fact at the high level of latentness of corruption crimes principle of inevitability of punishment is violated, the situation of impunity is created, motivation of feasance of new corruption crimes appears.

Thus, establishment of criminal responsibility for the illegal enriching as the special article actually shows the last control element in the mechanism of criminal law counteraction of corruption, that is sent to providing of inevitability of responsibility for any forms of the corruption (illegal) enriching.

Among the russian specialists also supports suggestion about introduction of the special article for the illegal enriching also the known criminologist V. Luneev. Illegality of enriching in considerable sizes would confirm fact of perfect earlier corruption crimes. V. Borkov spoke out well-aimed on this occasion: «Criminal responsibility must come not after in itself the fact of disparity of actual and official incomes of official, but for his **previous** (my insertion. - K.V.) corruption behavior that gave to such misbalance» [3, 31]. It goes out that bringing in to responsibility for the illegal enriching will side testify to confession of the inability to disclose a corruptioner in earlier perfect official crimes by law enforcement authorities [3, 28].

It follows to agree with suggestion of the russian researchers about that a norm about the

illegal enriching was examined as general in relation to the concrete crimes of special part of Criminal Code that provides responsibility for corruption crimes. Clear that at the receipt of bribe or illegal participating in entrepreneurial activity, theft with the use of the official position of benefit of property character get to the official illegally. Thus, «illegality» comes forward as a summarizing and at the same time key sign [3, 28-29].

Claim of O. Dudorov and T. Tertychenko looks reasonable: that is «provided in the article 368-2 of Criminal code of Ukraine of determination of the illegal enriching … dilutes basic content of analyzable corruption act in understanding of the Convention: live not on the earned money and does not can it properly to explain - you are a criminal» [4, 30]. Thus, from one side, Ukraine entered criminal responsibility for the illegal enriching, executing the international obligations related to ratification of the Convention formally, and from other - the norm provided in the article 368-2 of Criminal code does not represent the sign of the illegal enriching as act that is provided in the article 20 «illegal enriching» of the Convention of the UNO against a corruption in 2003 (farther is Convention) properly. In her it is marked: «on condition of observance of the constitution and fundamental principles of the legal system every State-participant examines possibility of acceptance of such legislative and other measures that can be necessary for confession of the intentional illegal enriching a crime, that is considerable increase of assets of state public servant, that exceeds her legal profits and that she cannot rationally ground» [5].

The article 20 of the Convention sets presumption of criminal character of considerable increase of assets of public servant, that obviously does not answer her to the legal profits. And this presumption the indicated person that is accused of the illegal enriching must refute. By plan of authors of the Convention a norm about the illegal enriching is called to counteract to the most latent varieties of corruption crimes. With the aim of implementation of the indicated norm in a national legislation, some russian researchers suggest to complement Criminal code of Russia of the article 290-1 «Corruption enriching» with disposition of next content: «Exceeding of the assets public servants, and similarly assets near relatives above legal profits in a considerable size…» [3, 31]. Offered variant of the article, comparatively with content of the article 368-2 Criminal Code of Ukraine, in more considerable measure answers the signs of the act provided in the article 20 of the Convention.

A norm about the illegal enriching, that recreates signs of the illegal enriching from the Convention, is provided by the criminal laws of row of the foreign states, in particular, Lithuania and China. In part one the article 395 of Criminal code of Peoples Republic of China is indicated: civil servants, cost of property of that or the charges of that exceed the size of legal profits obviously, and this exceeding folds a a significant amount, can be under an obligation to explain the source of profits. At impossibility of confirmation of legality of profits a sum that folds a difference is considered illegally got. For the committing of the indicated crime provided punishment as imprisonment within 5 years or short-term arrest, and property surpluses are subject to confiscation [6]. Already the known cases of conviction after the article about the illegal enriching in Lithuania.

Criminal code criminalizes an act, and the illegal enriching is the result of acts essentially. But as soon as will we begin to translate it in a criminal process, in the real procedures, there is a question: that must be included to subject of fact in issue in this case? To assert that the «illegal enriching» is a standard norm, hardly maybe [7, 53-54].

In practice fact of presence of such exceeded real incomes above legal in a considerable size actually can be examined as a crime (illegal enriching) subject to condition, if a self official person will not prove other, that is will prove legal character of the got benefit. That the real assets of official considerably exceed him legal profits, can testify to the presence of signs of corruption behavior and generates serious doubts in that he is not corrupted. In such case it is possible to conduct speech about presumption of doubt in his unguiltiness.

Russian researcher G. Bogush does not support suggestion about introduction of the special article that will provide responsibility for the illegal enriching. Embodiment of such suggestion, according to his opinion, does not coordinate with positions about presumption of innocence and enters in a criminal law the elements of objective relation for guilt. On the indicated inconsistencies

ukrainian researchers turn the attention [4, 30; 8].

In relation to contradictions between principle of presumption of innocence and norm about the «illegal enriching» it should be noted following. Presumption of innocence does not eliminate possibility of realization of the various legal proceedings under the aim of receipt of proofs in criminal case. In such case it will be needed to prove fact committing of those or other crimes, that pulled at after itself enriching, but vice versa, absence of legal grounds for the considerable increase of assets of official person. Thus, quite possible to take off from an official person that is checked up, load of ground by her to legitimity of her property of considerable cost. [3, 29-30]. As known, the load (duty) of proof of guiltiness lies on to the accuser.

It follows to consider accusatory proof of bribery any property of considerable cost of accused, that substantially exceeds the profits declared by him and the origin of that he can not properly explain. This will be deriving material proof of criminal activity, as he carries part of that information, that was contained by the subjects of crime, if they succeeded to be searched and attach to case. Event of crime - receipt of bribe - can «form» the illegal enriching of defendant. From the point of view of mechanism of information transfer, part of substantial signs, that is contained for missing objects in case, is recreated in money, values, to the real estate and others like that, that is fact of the illegal enriching, possessing property the origin of that is incomprehensible, side discloses accused in a bribery [9, 8].

Clear that any principle, position can provide certain exceptions. Exceptions, when on a defendant a duty to prove the unguiltiness lies in the certain categories of cases, provided by a legislation of a many countries. The states defined independently, in what cases it is expedient to limit the action of principle of presumption of innocence. Thus practice of national courts of these states and European Court on human rights in this question constantly changes and develops [10, 12]. In particular, position about the load of proving in the English criminal process purchased original sense and provides next exceptions. In obedience to Law on warning of corruption official, that got the gift, obliged to prove that his actions are unconnected with a corruption. As noted in French legal literature, principle of presumption of innocence comes forward just as principle, but not dogma, that is why in some categories of cases the load of proving depends upon defense. An exception from traditional position about the load of proving provided by Criminal Procedure codes of Italy and Poland. Criminal Procedure code of Belgium, in particular, does not spread fully operating of principle of presumption of innocence on the so-called formal crimes [11, 315-316]. Exceptions from position about the load of proving are provided by the decision of the European court on human rights (Castelua case). Specifically a question decides in relation to possibility of setting to of load of proving in the criminal process of the USA. In 1987 in case «Martin - the state of Ohio» Supreme Court of the USA decreed, that a laying-on the accused of duty of proving circumstances of necessary defense did not violate principles of constitutional right, including presumption of innocence [12, 9].

In the whole world confiscation of property is one of main instruments of anticorruption politics. Thus the question is about such confiscation, when the load of proving legality of acquired property depends upon an official. In particular, resolution in 1997 AGN/66/RES/17 of General Assembly of Interpol contained suggestion to put on accused duty of proving legality of origin of the property acquired during criminal activity. In part eight of the article 31 of the Convention is indicated that «states-participants can consider possibility of establishment of requirement about that a person that committed a corruption (my insertion. - V.K.) crime proved to legal origin of such imaginary profits from a crime ... by a that measure such requirement answers fundamental principles of their internal law and character of judicial or other trial» [5]. The Convention of the UNO against the transnational organized crime in 2000 in the article 12 contains similar positions.

As experience of other states testifies, a main place economic facilities must occupy in the mechanism of counteraction to the corruption enriching, foremost confiscation of «in rem». Confiscation of «in rem» (word for word - against property) is actively used in many states of the world. Confiscation of «in rem» is used in the cases when property of accused considerably exceeds him legal profits and there are grounds to consider that property acquired by a criminal way. The

indicated variety of confiscation is widely used in the USA - civil after the legal nature and procedure at that the load of proving legitimacy of origin of property usually depends upon his proprietor is unconnected with previous conviction of person. The statute-book of the USA gives possibility to the courts to give out temporal prohibitive orders that limit the legal capacity of property proprietor, or distrain yet to the pronouncement of accusatory sentence, and the proprietor of this property must prove already after it, that it acquired by a legal way. A legislative norm about «refutable presumption» (the article of 853(d) divisions of a 18 Statute-book of the USA), in obedience to that all property of person, accused in the committing of felony, for that there is the provided confiscation, must be it is withdrawn, is used in such case, if there are proofs of that the indicated property is got during criminal activity, and the legal sources of his receipt are absent. The marked presumption a proprietor can refute only, giving proofs to legality of origin of his profits [13].

The legislation of Norway, Poland, Portugal, Hungary and many other states lays the load of proving legality of the got profit during criminal activity on accused. A profit is considered the benefit got as a result of committing of crime, if other is not well-proven.

Acting Criminal Procedure code of Ukraine in 1960 and new Criminal Procedure code in 2012 which comes into effect on November, 19 in 2012, does not contain positions that would provide the laying-on of load of proving legality of the got profit during criminal activity on accused. In this connection, taking into account the stated, needs introduction legislation of Ukraine confiscation of «in rem», taking into account, that her introduction is recommendation of Group of the states on a fight against a corruption (GRECO), the member of that is Ukraine.

Conclusions

Thus, introduction of the special article for the illegal enriching is expedient, gives to law enforcement authorities of Ukraine an additional legal instrument is important for counteraction to the corruption enriching. The article about the illegal enriching in Criminal code must provide the conventional signs of act and contain disposition of next content: «Exceeding of the assets official persons, and similarly assets near relatives above legal profits in a considerable size…». Taking into account modern realities, with the aim of strengthening of counteraction to the corruption principle of presumption of innocence requires a revision and must contain certain exceptions.

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N.F. Rzhevska
candidate of political science,
(Kyiv National Aviation University, Ukraine)

STRATEGIC PREDICTION SYSTEMATICNESS IN THE USA POLITICAL ANALISIS MODEL

This article is highlighting the special use of the in the strategic prediction process. This problem is analyzed in the theoretical and practical aspects. There is a brief analysis of the systematic approach usage in the prediction of the USA political analysis model.

The research of strategical prognostication, in particular the USA, where was its main theoretical and applied formation grounded, is very important, first of all, because of the political theory development and its adoption in the modern world political practice. Nowadays, when the political systems are making the huge turn to the democratical values, humanitarian priorities, culture of piece and mutual cooperation at the international arena, without the detail professional analysis and making out prognostications, avaliable and historically based possibilities for democratical transformations making out is a pretty risky deal, sometimes an impossible one.

The main role in the providing USA foreign policy strategy belongs to the main American "think tanks" (under the term "think tanks" one means a group, institute or centre, organized for the intensive investigation and conceptual providing of the political and secutiry strategies of the USA) that makes out the American behaviour scenary in the world, as well as, basic grounds for the international strategy political assessment, give the recomendations for the most problems according to the foreign and domestic policy in general [5, p.2].

Prognostication, the basis of which grounds in the person's cognitive activity is getting important kind of social prognostication. First of all, it is connected to the one's experience, modern phenomenons and processes knowledge. It is based on the scientific data, dynamic and statistic rules. Social process prognostication is a an independent prognostication branch the first of all is combining the primary data of history, sociology, political science, statistics, demography etc. Moreover, evry single prognostication has the veritable character.

The most difficult kind of prognostication is a political one because it deales with the processes and events on the political arena. Politics touches the million's interests and theirs ways of life, and politicians, specially, political elite have to prognose the results of their actions.

Startegical prognostication is based on the situation modelling knowlegde, development tendency analyse abilities, and according to this data one gets the abilities to find out the changes necessity, work out the changes strategy, use the save methods and it needs from the subject some abilities to embody the strategy into life. Reality strategical prognostication gives an opportunity to determine the real state of things, as well as, total possibilities, showed by means of this analysis, dynamics and perspectives of single objects and as well as totality of objects development that are making out the system and factors or grounds that speed up or slow down the movement to the aim. According to the knowledge one can make out some variations of decisions for the situations development influence in the certain direction.

The principles of strategical prognostication is makd out due to the concerete scientifical prognosticational methods of research. Nowadays there is a great amount of general as well as The principles of strategical prognostication is makd out due to the concerete scientifical prognosticational methods of research. Nowadays there is a great amount of general as well as particular social prognostication methods. Austrian futurist Erich Yatch thinks that there more than 200 of them and it is not the end.

Political analysis is, first of all, the concentrate effort aimed at the research and finding out the key properties, the very alternative versions of the political course.

Political and social purpose analitical centres in the West began to appear starting the beginning of the last century. From the very beginning they represented themselves as university structures which were involved to the govermental programms making out. They were intellectual

cooporations that tried to combine the scientific innovative offers with the political science, grounding social humanitarian modelling.

Specialists are determining the think tanks in a different way. Anaway, they can be determined in general as: 1) institutes, cooporations or groups organized for the interdisciplinary researches; 2) consultative experts committees that provide the researches and give some special tips to the government; 3) independent intellectual structures that embody the players in the political process. Besides this term is used as a general title for the military laboratories, cooporations, academies, organizations that are supporting multidisciplinary theoretics and intellectuals that are orientated towards the analytical or political recommendations working out. [2, p.6]

For the systematization and charactiristic step by step development of think tank scientists are using the following criteria as the time of forming; oraganizing mission (determinant tasks they are solving); the way of acting and its structural organization way; specific way of cooporation with the government [3].

Nowadays a lot of transnational non govermental organizations that are based in the USA are aimed towards the researchment of the different ways of the world politics. It is better to determine four basic types of the USA NGO: specific ones with the determinate professional specialization; cosmopolitan based on spiritual development of the person; transnational, they include the transnational cooporation; as well as, analytic cooporations or think trusts. The last ones play a key role in the foreign policy of the USA.

Analytical cooporations can be determinated as a basic points of the USA global force. They are taking part in the solving problems of the political reality correction by means of the full cycle of analitical production: from the problem analysis to the decisions implementation in terms of mamagenent system. The part of of them is oriented towards the cooperation with the global insitutions, first of all, UN, part is a link of state mechanizm. Formally, independent intellectual institutions are organized on the model of business cooporations, they have often branches. As, for example, Cernegie foundation has the branch in Russia, RAND – in GB and in Holland [4, p. 2].

“Think tanks” are thought as high-principled base of the international political power of the USA. Here the idea generating process is combining with the applied pecularity within the simultaneous realization of aim strategy that maens the concrete social economic and political results. The last one positons differs them from the exclusively academic structures. Very often analytics are dealing with the high-principled providing of the political cultural expansion of the USA. Such a mission have Carnegie Endowment for the International Peace and Brookings Institution. The leading think tanks are under the influence of state interests, first of all, political economical and security interests. According to the high level of the American society economization level such interests are the same level of importance for transnational cooporations as well. The activity of the think tanks is mostly determined by the influence of the cooporation that provides the research financing, political leaders activity support, periodical and special literature publishment. Analytical structures are the special link of the American political system governance that combine in a functional way cooporation activity with the foreign activity of the state. American analytic cooporation functioning is truly supported the big business, so it is more than just a simple reflection of the social structure society pecularities.

The objective ground for the strategic prognostication according the American analytic centres is a systematic building of the political phenomenon or process that is researched. The point is that, orientation to the systematic principle makes up the one from many main pecularities of the modern scientific style of thinking that appeared in the second half of the 20 century in the USA. It was taking the leading places during the long period of time in the world science. At the same time, during this period of time are a lot discussions because of the aims and tasks of the “general system theory”, system principle content, especially in political researches.

Prognostication of the social political processes needs a historical experience from one side and the traditions of the certain society. From another side, logics of the system method application is combined with the civilization experience that means that modernization encloses all the society spheres. Modern theoreticians determins political as well as social, economical, spiritual and other types of modernization. Political modernization with its specificity is a synthesizing according to the given above types because of its main characteristics is providing structural and qualitative changes not only in politics, but in social,

economical, cultural and other spheres, creating the terms for stability and consolidation of society.

"The main point of system analisys and prognostication social and political prosecces demands is the next: the research of certain social system in the modern conditions is impossible if it is not crossing its borders. Such an approach can change not only the way of thinking but also practical actions in process of social organizm reformation. Neglecting the principle of the old system borders crossing, unwillingless to refuse from stereotype ideas, as a rule, instead of society modernization cause its visibility" [1, p. 47].

System approach of the state analytic structures creates a clever alternative during the making out of strategical decisions. Special councils and associations within the think tanks are organizing different researches of the actual problems in foreign affairs. Their advantage in taking of foreign policy decisions is a possibility to use its own structure for the research activity results in the certain political programs. The institute of advicers itself gives a chance to carry out the task of foreign policy management by means of more flexible mechanizm. As a rule, the most important influence belonbs to the advicers that are closer to the leaders. Disputation in the collegiate circle can be strict but they don't ruin the general line of the USA behaviour on the international arena. Moreover, the potential of the analysts conformism in team is carried out not in a complete way in favour of security forces. However group or corporative logics of the top-managers about the foreign policy management is mostly based on the general system ideology.

The principle of prognostication systematic is combination of all the prognosed indexes of the object, its environment and important factors.

System approach is a methodology of the object's analysis in terms of nature and society as well, as a system, and the prognostication objects can be considered as systems, so it can be applied to problems prognostication. Such a principle is the main one of the USA analytic centers.

The relationship between the elements in the system have certain properties that are characterizing connection, interaction or orderliness of the given elements, so they are the certain display of the central principle about integrity of the system. There are two main functions of the system approach: a) formulation of the problems for getting new knowledge and solving new tasks; b) methodological analysis of the certain knowledge is carried out on basis of integrity principle, according to this principle the interconnection and cooperation of the elements are producing new system properties of the object that are not typical for its single elements and for the number of other principles.

In such a way, prognostication of the state or behavior of the system one cannot consider it as formal prognostication of the state or the of system elements action, there should be taken into account their interconnection and appearance of the new properties due to the new state and behavior of the components.

Systematic in prognostication means that policy is a united object, but from other hand it is a complex of the independent blocks of prognostication. Such a principle gives a chance to get a visible model of the researched object in the system of its direct and reverse, hierarchical and coordination relations, determine its main system features – basic structure, content, functioning, ways of realization [1, p. 46].

So, the matter of system prognostication in the American school of political analysis needs the usage of cooperation within the system, as well as, the connection ways between the object of prognostication and prognostication background, in other words, evironment. System analysis demands such a prognosis construction that is based on the models and means system.

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S.V. Sidenko
Doctor of Sciences in Economics, Professor
(Institute of International Relations
of the National Aviation University, Ukraine)

INTERNATIONAL COOPERATION OF UKRAINE IN THE AEROSPACE SECTOR

The article deals with the issues of Ukraine's international cooperation in the aerospace sector under the conditions of innovation-driven development. It reveals the necessity of integrating intellectual resources as well as research and production potential of different nations, in order to solve global problems, in particular pertaining to the development of air transport.

The unfolding of the contemporary process of globalisation fosters technical advance due to competition and economic stimuli inherent in the global markets as well as the integration of the world's financial and scientific resources. Therefore, the present-day technological progress acquires quicker pace and is more fundamental by its character. It is just the technological transformations we are currently witnessing, being closely interwoven with globalisation, that are factors shaping the new paradigm of social and economic development of the world.

Under the new conditions of development, competitive advantages of different countries have undergone changes, because intellect, experience, knowledge, and social values are becoming the main factors of competitiveness [1]. The very use of these advantages enables many countries to secure high performance in the global competition. These issues are crucial for every country in the world, and Ukraine is not an exception, as there is a high need in determining and further developing those branches of economy which intensively utilise the above-mentioned factors of global competitiveness.

For Ukraine, as well as for other countries that have performed market-oriented reforms, production autarchy and creation of closed production cycles are becoming nonviable because of the high cost of research and technological equipment, the permanent growth of the amount of vitally needed technologies, and the reduction of amortization terms for high-tech products. Currently in Ukraine, the share of the products manufactured using innovating technologies does not exceed 6 percent in the total value of the marketed products. Consequently, the potential of innovation-driven development of the country remains underemployed.

In this sense, international production and scientific cooperation are efficient tools to distribute the growing expenses and to achieve desired concentration of scientific and technological achievements and qualified labour. Ukraine, due to its possession of actively operating research and technological potentials and production facilities, has all the necessary prerequisites needed to participate in international cooperation.

The intensification of technological development and the introduction of high technologies emphasise for Ukraine the necessity of expanded scientific, technological and production cooperation with other countries. It is also caused by the need to integrate scientific and research potentials, in order to solve the global problems, primarily ecological, water and foodstuffs supply, climate change and other.

Ukraine is currently developing scientific and technological ties with different countries along multiple directions. Production and technological cooperation with Western as well as CIS countries, including traditional ties between Ukraine and Russia, is most notable in such sectors as space-rocket, aviation, production of other transport vehicles (locomotives, sea vessels, and motor cars), agricultural machinery, power and nuclear energy equipment, as well as in chemical, petrochemical and oil refining sectors.

Mutual interaction in the aerospace sector belongs to the most important and promising fields of international scientific and technological cooperation. Ukraine has the required scientific and technological potential for this purpose; it is enough to say that the country is among the group of

seven nations possessing closed cycles in aircraft production. It maintains versatile cooperation ties in research, technology development and production with foreign partners operating in this field.

First of all, Ukraine closely cooperates with Russian Federation in the space-rocket sector, basing on intergovernmental and interbranch agreements, i.e. within the framework of the agreement between the Russian Federal Space Agency and the National Space Agency of Ukraine. Due to it, well-known Ukrainian research centres and producing enterprises maintain scientific research and production technology ties with Russian organizations and companies, performing within the bilateral cooperation framework about 40 and more percent of the scientific research now underway.

The Russian-Ukrainian cooperation in science and technology substantially favours the implementation of Ukraine's national space programme which embraces development and modernisation projects for space technologies and equipment. In particular, the joint programme of the Russian Academy of Sciences and the National Academy of Sciences of Ukraine on fundamental space research using automated space vehicles envisages scientific research of the Earth from the outer space and of the physical processes in the near-earth space (monitoring space bodies of the Solar system, distance sounding of the Earth, predicting earthquakes) as well as the development of a general satellite data transmission system and national terrestrial infrastructure designed for information reception and space complexes control. Research in space biology and physiology is also of great significance to both countries.

The National Space Agency of Ukraine participates in the research project on space materials technologies 'AOUS-Photon' within the framework of the Federal space programme of Russian Federation, and in the research on the 'Coronas-F' project which enabled to reveal the dependence of the potency of fluctuations in solar luminosity on fluctuations in the atmosphere. The Ukrainian and Russian researchers are currently developing onboard exploration, control and checkout equipment for the 'Sich' space vehicles; they are taking part in the 'Interball' international project as well as cooperating in the field of global navigation space systems using the Russian GLONASS system. In this context, August 2010 brought the enactment of the agreement between the governments of Ukraine and Russian Federation on cooperation in utilization and development of the Russian GLONASS (global navigation satellite system) system signed on May 17, 2010.

The above is augmented by the Russian-Ukrainian programme of scientific research and technological experiments at the Russian segment of the International Space Station.

Joint research of science workers and producing entities participating in the international Sea Launch consortium and Kosmotras company safeguard provision and dissemination of satellite communication services and digital TV broadcasting on the territory of USA and Latin America, Internet access and data transmission for users in Northern and Central America, Alaska and Hawaii, digital TV broadcasting to Japan and other Asian countries.

In the aircraft construction industry, the prospects of interaction of Ukraine and Russia are associated with integration of their aircraft-building complexes and possible creation, on a parity basis, of a joint aircraft venture for unfolding production cooperation in a series of projects (AN–140, AN–148, TU–334) with the participation of the Russian United Aircraft Corporation and the Ukrainian ANTONOV Company.

Good prospects exist for cooperation of Ukraine with the European Union member-states based on their fixation in the Partnership and Cooperation Agreement as of 1994. It stipulated that the parties were to develop cooperation in the areas of science and technology, including space research which requires creation of a basis for mutual economic, social, financial, civil, scientific and technological, and cultural interaction. The EU-Ukraine Action Plan adopted on February 21, 2005 within the implementation of the European Neighbourhood Policy emphasised the necessity of consultations on possible utilization by the EU of Ukrainian facilities in the area of distant transport carriage and further advance in cooperation in space activities.

On December 1, 2005, important landmarks in the development of international interaction between Ukraine and the EU were set by the signing of the agreement on Ukraine's participation in the European GALILEO Programme of satellite radio navigation extending on the fields of

scientific research and development, industrial production, provision of services and development of markets, standardization, certification and frequency control, as well as by the conclusion of the first agreement between Ukraine and the EU in the area of civil aviation providing unobstructed access of European airlines to the Ukrainian market and creating opportunities for Ukraine's accession to the EU's Common Airspace (negotiations on the subject were launched in December 2007). The agreements envisage subsequent extension to Ukraine of the European Geostationary Navigation Overlay Service (EGNOS) [2].

Currently, the following principal directions of cooperation between Ukraine and the European Union in the field of aerospace sector may be noted:

- Development of joint projects on restructuring of the aerospace sector in Ukraine within cooperation in high technology areas and industrial conversion.
- Development of a Global navigation satellite system.
- Development of cooperation in the field of aerospace science, life science and microgravitation, exploration of the Earth from the outer space.
- Exchange of information on distance sounding of the Earth in case of emergency.
- Provision of data on space environment control and seismic monitoring.
- Common use of the information received from space vehicles of Ukraine and EU member-states and exchange of information from artificial satellites of the Earth belonging to them.
- Common use of existing terrestrial space infrastructure of Ukraine and EU member-states.
- Participation in conferences, symposiums, seminars on space subject which are held under the EU aegis.

New prospects for EU–Ukraine interaction in the aerospace sector have been opened by the adoption in 2010 of EU's new innovation development strategy under the title 'Europe 2020' [3]. Its key component is the 'Innovation Union' initiative [4] targeted, in particular, at integrating research and innovation to solve global problems. In 2012 the European Commission produced the Working Programme for implementation of this Initiative, designed in particular for integration of research and innovation to find solutions of the global problems. The Working Programme 2012 outlines three most important social and economic problems granted priority status in strategic research and innovation: eco-innovation (reduction of carbon dioxide emissions and efficient use of natural resources); security and mobility (optimisation of efficiency and security of the transport system); competitiveness at the expense of innovations.

In order to solve these social and economic problems, the following priorities have been determined:

- Rising ecological standards for air transport.
- Enhancing the efficiency of time control.
- Safeguarding satisfaction and security for clients.
- Rising economic efficiency.
- Protection of flight vehicle and its passengers.
- Innovation in the development of air transport of the future.

The implementation of this Programme is to become an important step in the development of air transport and provision of its efficiency and security.

For Ukraine, these priorities have acquired utmost importance in the context of elaboration and preparation for signing of an association agreement between Ukraine and the EU, including creation of a deep and comprehensive free trade area. The text already prepared for signing as well as the currently operating EU-Ukraine Association Agenda to prepare and facilitate the implementation of the Association Agreement [5] provide, inter alia, for full conformity of Ukraine's' aviation rules to EU's *acquis communautaire*, including the harmonisation with the EU of the legislation pertaining to flight security and adoption, for this purpose, of a new Air Code. This is to become a precondition for Ukraine's inclusion into EU's Common Airspace.

Conclusions

Efficient development of high technology industries on the whole and in the aerospace sector, in particular, is viable in the contemporary globalizing world only under conditions of broad international cooperation, integration, for this purpose, of intellectual, financial, and manufacturing resources.

This necessity reveals itself for Ukraine primarily in the area of the aerospace sector where the country possesses a potential for international competitiveness. The implementation of this potential substantially depends on the development of Ukraine's interaction in the aerospace area with Russia and its integration with the European Union, as well as corresponding adaptation of its internal legislative and regulative system along these lines.

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Vira Mazur, Nickolay Zosimovych, National Aviation University, Ukraine

PROSPECTS OF UKRAINE'S JOINING OF EU OPEN SKIES AGREEMENT

This article contains the detailed analysis of current issues and prospects of Ukraine's entry into EU Open Skies agreement.

Today, there exist two different meanings of "open sky" term. First was set by the Chicago Convention in 1944 and means the mode of use of air space in the international aviation business. The second meaning is the regime established by the 1992 agreement as one of the confidence measures of international security, as well as an element of verification of agreements on arms control. In addition, this agreement provided the distribution of "Open Skies" as instrument for monitoring and protecting of the environment. In this paper, an "open skies" will be analyzed only as the former.

Open skies is an international policy concept that calls for the liberalization of the rules and regulations of the international aviation industry – especially commercial aviation – In order to create a free-market environment for the airline industry. Its primary objectives are:

- to liberalize the rules for international aviation markets and minimize government intervention as it applies to passenger, all-cargo, and combination air transportation as well as scheduled and charter services
- to adjust the regime under which military and other state-based flights may be permitted.

According to Article 6 of Convention on International Civil Aviation (known as Chicago Convention), scheduled international air services can be performed over the territory or on the territory of a Contracting State only by special permission or other authorization of that State and under the terms of such permission or authorization. Each state has the right to allow, restrict or prohibit, and regulate the performance of any flight on their own or through its territory, including commercial transportation of passengers and cargo. For open skies to become effective, a bilateral (and sometimes multilateral) Air Transport Agreement must be concluded between two or more states.

The freedoms of the air are a set of commercial aviation rights granting a country's airline(s) the privilege to enter and land in another country's airspace. Formulated as a result of disagreements over the extent of aviation liberalisation they are standardized set of separate air rights which may be negotiated between states:

1. To fly across the territory of either state without landing.
2. To land in either state for non-traffic purposes, e.g., refueling without boarding or disembarking passengers.
3. To land in the territory of the first state and disembark passengers coming from the home state of the airline.
4. To land in the territory of the first state and board passengers travelling to the home state of the airline.
5. To land in the territory of the first state and board passengers travelling on to a third state where the passengers disembark.
6. To transport passengers moving between two other states via the home state of the airline.
7. To transport passengers between the territory of the granting State and any third State state without going through the home state of the airline.
8. To transport cabotage traffic between two points in the territory of the granting State.

The convention was successful in drawing up a multilateral agreement in which the first two freedoms, known as the International Air Services Transit Agreement (IASTA), or "Two Freedoms Agreement" were open to all signatories. As of mid-2007, the treaty is accepted by 129 countries. The third to fifth freedoms shall be negotiated between states. Because only the first five "freedoms" have been officially recognized by international treaties, the ICAO considers the remaining "freedoms" "so-called".

The first and second freedoms of air by themselves do not contain any of the rights to perform

air transportation, and are not directly involve any commercial activities on the territory of the State. But in some cases, these "technical freedoms" may have a significant economic importance as having the right of passage for a shorter and more efficient routes and the ability to have a refuel can increase the passenger load of aircraft, and thus generate more revenue from the use of those two basic freedoms of the air while operating over third countries.

In cases when this state has a large territory and significant number of direct air routes connecting many other states, granting foreign airlines the right to fly would produce great economic benefits. It is no coincidence that countries, whose territory is essential for transit routes, do not participate in IASTA. Among them are Russia, Brazil, China and Canada. These countries prefer to regulate the transit crossovers and technical landings on a bilateral basis.

Disorder in the air space of the European countries caused by volcanic eruption in Iceland in April 2010 gave a "new momentum" for creation of unified EU airspace management. The European Commission in close cooperation with air traffic experts from EU member states agreed on a mandate for the European air routes management (European Network Manager) and laid the foundation for the way of introducing a unified European air space.

However, some states consider this plan as a risk to national security, and trade unions of aviation industry are concerned that according to the plan implementation several tens of thousands of professionals would be fired.

As you know, Ukraine started preparation to sign the treaty in December 2007 and since then held five rounds of negotiations. But, as president of “Ukraine International Airlines” (UIA) Yuri Miroshnikov mentioned, Ukraine's entry to the European common aviation space would give a huge competitive advantage for European airlines. They will have virtually unlimited access to the Ukrainian market. And their huge resources and opportunities would be disproportionate in comparison to all Ukrainian airlines. Even one powerful carrier (like Lufthansa) just in one-year term due to dumping and other tools could minimize the position of domestic airlines. And once they lose their financial stability or even leave the market, the foreign company will compensate all the losses due to the increase of tariffs for markets to which it will receive exclusive access. Therefore it is important that public policies and strategies of state would be lined up with the long-term view of development of domestic air industry. However, he noted that it is not a full rejection of Ukraine from the opening of the market. Ukrainian airlines say about deliberate actions to ensure equal conditions for domestic companies in acceding to the "Open Skies" as now the resources of domestic and foreign air carriers obviously are not comparable. And so the proper preparation for the opening of the sky will largely depend on the actions of the state. In Europe rules are unified as they have many years of experience in standardization. Recently Ukraine has started to implement European standards, but still there are many outdated regulatory acts, and some of them even come from Soviet times. Of course, in such different fields of regulation is very difficult to ensure stable control of safety and equality of opportunity for market participants.

On the EU side also there is one very distinct advantage: leading carriers of member countries almost exclusively own commercially good slots in their base airports. After all, you can offer competitive prices, but if you can not fly to the airport in convenient time, it is a serious disaster for revenues. Again, among the factors that limit the possibility of Ukrainian airlines are unequal taxation and configuration of the aircraft fleet. For example, in EU import of aircraft for international transportation, as a rule, completely exempt from value added tax (VAT). In Ukraine, VAT is not charged only in case of operating leasing, when the ownership of the aircraft is not transferred to the airline. This factor artificially limits the ability of domestic carriers to upgrade the fleet, as the cost of the aircraft is at once increased by 20%.

Another deterrent is that Ukraine has signed but not ratified the Cape Town Convention. This document protects the interests of the owner of the aircraft in situations where the aircraft operator has a problems. If the Convention was ratified, in the case of bankruptcy of the air carrier, vendor equipment would have been seamlessly returned to leasing company. Ratification of the Convention would reduce the risk of the lessor for import of equipment in Ukraine. Consequently, payments to leasing company for Ukrainian airlines would be less.

Finally, a formal pretext for delaying the signing of the agreement on Ukraine's accession to the European open skies is a requirement of Schengen visas for Ukrainians to fly to many European countries. Before this time no other country connected the question of visa-free agreement with unified European air space. For example, there is a visa regime with the EU for Georgia and Moldova, but those countries already signed an agreement. Thus, experts link this nuance to the close relationship between politics and economic sectors, including aviation, which are common for Ukraine. However, the Ministry of Infrastructure continues to insist on the introduction of visa-free regime and actually block the signing of the agreement on "Open Skies". The ministry said that Ukraine does not intend to abandon their demands for visa-free regime, as the one-sidedness of the visa regime creates a competitive advantage in favor of Western Airlines and Ukrainian airlines employ more than 20 thousand people who could lose their jobs.

But the real obstacle to the signing of the agreement is not a visa regime with Europe. Ukrainian Civil Aviation Service noted that there are number of technical issues on inconsistencies of aircraft certification systems in the EU and Ukraine. The key issue, on which Ukraine insists, is to let Ukrainian and Soviet-produced aircrafts to have access to air transportation market and operation as the part of "Open Skies" certified park.

Unfortunately, Euro Commission insists that, under EC Regulation N216/2008, the Ukrainian State Register of civil aircraft has to withdrew all non-certified European Aviation Safety Agency (EASA) aircraft. Moreover, Ukraine has to pass the certification authority to EASA. In response, Ukrainian Civil Aviation Service pointed out that, according to the Chicago Convention, Ukraine as a developer and manufacturer of aircraft is responsible for maintaining the airworthiness of tens of thousands of uncertified EASA aircraft and their components, and therefore can not agree to the following conditions.

Now only An-26 has certificate of EASA. All our other aircrafts, including "Ruslan" and AN-148, are flying over Europe without this certificate, and each type of aircraft certification costs $ 40 million a year. Only option to address this issue is the agreement on mutual recognition of certificates of airworthiness (BASA).

Conclusion

As summary, we can come to the conclusion that there is ambiguity of the Ukraine-EU "Open Skies" issue. From one point of view, mutual opening of aviation markets, as well as to application of the same standards in security, air traffic management, social services and protection of the environment would be huge step ahead for the state and for the passengers. But as a number of issues exist, probably Ukraine should not rush into signing the agreement, because it will be disastrous for Ukrainian carriers and aircraft industry. The state can not cope with the domestic monopoly on air service, so it obviously can't protect domestic airlines from European powerful carriers.

The Government of Ukraine has instructed relevant ministries to complete the negotiations on the joint aviation space with the EU until July 2, 2012. But as Ukraine failed to sign an agreement with the EU to the stated terms, it seems that negotiations will be completed up to 1 January 2013. The exact date of the next round of negotiations has not yet been agreed, but, according to Foreign Affairs Ministry of Ukraine, the Euro Commission believes that it can be held in Brussels in September-October 2012.

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Y.V. Kozachok, Doctor Litterarum, professor
(National Aviation University, Kyiv, Ukraine)

SOCIAL AND POLITICAL JOURNALISM OF MYKOLA KOSTOMAROV IN GENESIS OF MODERN POLITICAL THINKING (ON THE MATERIAL OF THE ARTICLE "TYSIACHOLITTIA [ROSIJI]"("MILLENIUM [OF RUSSIA]")

In the article the main conceptual political positions of Mykola Kostomarov have been analyzed, which are presented in his publicistic work "Tysiacholittia [Rosiji]"("Millenium [of Russia]"). Among them there is denial of origins and formation of Rus as a state from Novgorod and not Kyiv. The main genre characteristics of Mykola Kostomarov's political publicism have been defined.

The matter of national consolidation of Ukrainians stays very important even nowadays. The analysis of challenges and outlooks of further spiritual development of Ukrainian state makes it necessary to trace and study national tradition in this matter in context of social and historical development, the continuity of spiritual evolution of Ukrainians in conditions without statehood. Unfortunately the revival of statehood didn't cause final consolidation of ideological and core institutes. So we go back to the beginnings in order to answer the same questions, which arose and were important one and a half century ago.

Mykola Kostomarov was among those, who have formed the basics of social and political thinking of Ukrainians in the times of their political propaganda in the second half of the 19th century. This function was taken up by Ukrainian clerisy, which at that time was evolving as active social power after over 10 years stagnation after Kyrylo-Mefodiivske tovarystvo was destroyed. At the same time multidirectional factors influenced its character of thinking and behavior, which made it difficult to understand the situation, the specifics of the tasks and activity outlooks. First of all this is a feeling of deficiency, which has been formed over centuries, collaborationism and readiness to it of many wealthy Ukrainians, lack of proper education and restraint of ideological space, discrepancy between intentions and actions.

Exactly to such clerisy is addressed Mykola Kostomarov's article "Tysiacholittia"("Millenium") [3], which is important both for that time and present time. Even the title of the article contains implied sense, which allowed the author not only openness of expressions, but also directing the thesis of the article on the level of national Ukrainian problems. After the title "Tysiacholittia" the word Rosiji is separated by square brackets. This graphic arrangement and its meaning speaks with no doubt for itself: Russian history in authors' vision doesn't suit to this historical continuity – it's much shorter and different in its core.

In the article "Tysiacholittia" ("Millenium") M.Kostomarov analyzes on the level of spiritual evolution the millennial journey of Rus' development, the circumstances that influenced the social situation of Ukrainians in his time, its functioning in dependent space, complicated by interethnic relationships inside the empire, which escalated from time to time. Ukraine usually became victim of interethnic attacks, as well as social and political claims of those, who inhabited the territory of Russian Empire, as Ukrainians were incriminated by their opponents the worst political accusation – separatism intentions. The publicist describes the tactics of political behavior, tasks and ways of their implementation with the aim of protection from accusations and acknowledgement of national identity of Ukrainians.

The scientist-publicist when talking about problems of formation of the state analyzed moral evolution in particular of Ukrainian folk and warned like-minded fellows and all progressive contemporaries from mistakes, which caused and cause consequences that are fatal for the folk. The analysis of the article "Tysiacholittia" ("Millenium") shows topicality of its meaning for modern creation of the state.

Profound social and political analysis of those days situation in the article "Tysiacholittia" ("Millenium") was made in the period of the highest upswing of Mykola Kostomarov's publicistic

activity, when the process of clerisy formation started its development in Central and Eastern Europe. As a famous modern cultural studies scholar from Poland Boguslaw Bakula said, its genetic feature projected also on consciousness was *"feeling of national hopes defeat, which led to the fact that over decades it stayed in the sphere of literature and political influences of utopian streams"* [1;46]. All this set of ideological infidelity and dissimulation which still isn't outdated by today Kostomarov directs on the level of rational thinking, outlines its parameters and tasks, adequate for those conditions and possibilities. He was worried that victims of difficulties became clerisy and delirious young people, especially students, captured by national ideas.

Among problems analyzed by the publicist in the article there is admiration with trendy political slogans, substitution of active social work through declarations, resonant events, void of sense and background pseudo-Europeanism, ideological infidelity, tragic separation between Ukrainian classes, insufficient understanding of events and facts. Very urgent was a problem of interethnic relationships, law education level of clerisy, proper education for commonalty, mindless admiration of everything foreign without understanding of its sense etc.

The article "Tysiacholittia" ("Millenium") has been forming vectors of social thinking. Kostomarov opened the sense of one or another social problem, basing oneself not only on historical experience, but also on spiritual traditions of the folk, judged from its national identity and stood for the right of folk for it, that's why each of his articles provoked dispute.

Kostomarov as a publicist had a talent for satire and sarcasm, inherited from middle Ages polemic. The more furiously the opponents focused their accusations in separatism, the more convincing became the positions of Kostomarov in the light of discussions. As the main problems of disputes were grouped around national matter, the meaning of his polemic articles becomes clear for the present time as well.

Uncompromising attitude in polemic has led to refusal of teaching at the university. He's been a professor for a very short time. Because of his decency in moral issues, views on social behavior of student youth, denial of its participation in politically provoked campaigns he took a decision to get rid of his academic department for good. Political and student disorders in St. Petersburg, the polish issue were constantly throwing Kostomarov into a dilemma of position choice. True overtone of impossibility of teaching doesn't raise a doubt any more. Disputes with students were used by the government as a cause. The reasons, why Kostomarov's pedagogical career ended so early are badly hidden in editions of "Russkii vestnik" and "Moskovskie vedomosti", headed by the notorious M.N.Katkov.

The tragedy of Kostomarov-polemist and scientist is that his knowledge and thinking capacity exceeded those of not only his political foes, but also of his like-minded fellows, who often didn't understand his passion, incompliant adherence to principles even in details. Everything could be explained with his quick-tempered character that affected his way of leading discussions, poignancy of which was caused by standing for rights of people, who were enslaved politically and were being destroyed internally. This caused also a strong opposition of official quarters that were afraid of separatism ghost, so the logic and verity of proves based on historical events and facts didn't bother much.

At the same time he was a deep and interesting conversation partner, objective and adhering to principles, ready to abandon his position, but only if there were convincing proves from the opponent. Kostomarov was an active patriot, he stubbornly achieved practical implementation of his views. In particular he emphasized his social views in his artistic practice, enriched literature with new topics and genres. He gathered money for schoolbooks in Ukrainian for commonalty, enriched young people intellectually and spiritually with his teaching activity. As for historical science, it's hard to find the deed like his.

Kostomarov couldn't be stopped even by complicated circumstances of the decade since closing of "Osnova" and till the end of the 60-ies, which are considered to be a period of cultural stagnation, "intermission" in the development of Ukrainophile movement, connected with the Valuev Circular, 1863. He made it to the discretion of the society in the article "Tysiacholittia" ("Millenium"). He analyzes the retrospective, evaluates the situation and predicts the consequences.

By such means he is trying to enhance the activities of Ukrainian clerisy in the field of national idea, to outline its sense, parameters and organization ways. He is in the midst of the activities, in one person he forms a whole education institute of university type for those, who didn't orientate well enough in position and activity methods choice. We can judge about this first of all from the content and character of the article "Tysiacholittia" ("Millenium"), which is a kind of broad illustration of public opinion, worldview of Kostomarov himself, whose activity exactly in that period proves that the conviction of his positions and commitment to national Ukrainian idea didn't depend on the social circumstances.

Kostomarov analyzes the millennial way of Rus development not only in the context of social and historical progress and economic achievements, but also on the level of spiritual evolution. That's why he gives objective evaluation of spiritual state of his society and the influences, which have formed them. He wrote: *"Unclear humming around us. We hear the precious words: go ahead, progress, development freedom, publicity…." – a whole vocabulary of magical sentences, which make nervous the one, who wants to seem a social activist. But we didn't find out the meaning of those words for us, because we haven't found the direct close application of them to our living conditions"* [3; 126].

Kostomarov understands deeply and exactly evaluates the character of public opinion in Russian empire in the middle of the 19th century. We can also see that with his level and character of social life evaluations he stayed ahead of his time, he was thinking deeper and looking further. As an example he had facts from history of freedom-loving Ukrainian folk and examples from free-spirit people's lives from another epochs and nations. He was observing the activity of public-spirited Ukrainian clerisy, where his worldview has been formed, whose activity has also provided him strength.

In "Tysiacholittia" ("Millenium") M.Kostomarov focuses extra on science and education problems, says about the necessity to position them above social circumstances, above political trends. *"There are many explanations about respect to science and necessity of education, but in fact there's only few respect to science and the education is incomplete: when there is a need for professionals in one or another discipline – you have to look for it with Diogenes' lantern or recourse to foreigners"* [3;126], - resumes Kostomarov. He also means the character and consequences of student riots in spring 1862. In "Autobiography" when giving characteristics to certain activists of student riots, in particular well known Dmytro Pysarev, Kostomarov says about their amazingly low knowledge level, requirements of the administration concerning condescending (just in case) attitude by estimating these activists. In "Tysiacholittia" ("Millenium") Kostomarov criticized both the education system in Russia in general and educational programs, which in his opinion were written so broad that a person, who graduated from the university should be very educated and to which extent it doesn't correspond the reality and is impossible, his own conscience will show everyone, he thinks.

The truthfulness of social environment evaluations of that time confirms, among other things, the letter of Panteleimon Kulish to Mykola Biloserskyi from St. Petersburg from the 6th of March 1864, where it's being emphasized: "*The political waste has already blown on me in Moscow, where numerous St. Petersburg heads are staying… People are daydreaming about unrealizable expectations. It is boring and makes me sorry to listen to bookish conversations of progressionists. These gentlemen step back from participation in affaires while they are being nobly indignant at cruel deeds of different unwise people…though they could influence those affairs positively, they don't do anything in other life spheres, imagining that they can reach something with their endless explanations*" [4;159].

Kostomarov sharply criticizes empty talks about self-sacrifice and sacrifice on Ukrainian affair of intellectuals-sybarites, for whom small waste in order to please themselves with everyday comfort is better than any practical actions, in particular sacrifice for people's education. The publicist pays much attention to the problem of clerisy's inner spiritual lack of freedom, he also discovers its genetic causes and fatal absence of unity of strivings and actions: *"We talk about social unity, about interaction, but how few of it is there in fact proves the feature of our*

coexistence that in a society we're constantly ashamed of unknown people and cannot be open. And this is all because we don't have an aim which causes interaction and social unity…We have many ideals and don't have the next direct tasks, and that's why our strivings turn into fashion sphere instead of real life – and this is the saddest end! – Kostomarov wrote. – *Feature of fashion is to change and don't have a reasonable basis…"* [6; 127]. Taken without the slightest change from the context of the article "Tysiacholittia" ("Millenium"), these words would become an ornament of modern progressive public opinion, though over one and a half century has passed.

In the article "Tysiacholittia" ("Millenium") self-praise as well as "eating their heart out" of Russian democratic intelligentzia also became subject to disapproval. Russians, who live in a huge state, think that everybody should pay court to it because of its enormous material property, but they just find comfort in the idea that they're not behind free European civilization. A Russian member of intelligentzia is only able to self-praise or eat his heart out. Kostomarov considered that this is because there is almost no possibility for an intellectual to self-actualize in Russia. In his opinion this is the biggest tragedy of a thinking and talented person of his epoch. This is certainly true for our time as well.

By analysis of publicistic performances of Mykola Kostomarov several factors should be taken into consideration. In particular the fact that it isn't said about equation of Russian and Ukrainian clerisy. Technically Kostomarov and his like-minded fellows were Russian members of intelligentzia as they were citizens of Russia. And Ukrainian intellectuals felt the same negative social factors. So it is clear that accusation in lack of spirituality, absence of social ideals relates to a great extent to Ukrainian clerisy as well, especially when we talk about progress, education, freedom of thought, but also about social passivity. But the invective of Kostomarov is directed first of all not against clerisy, but mainly, though indirectly, sometimes just implied, against conservatism of government policy.

The main vector of Kostomarov's accusations, published in his article "Tysiacholittia" ("Millenium") brightly shows itself in the light of later definitions of origin, character and rank of Russian intellectuals of the 19th century. One of them belongs to Jurii Lypa. He held the clerisy of that time a purely Russian phenomenon, which started more or less since the 30^{ies} together with development of the universities. J.Lypa doesn't consider them to be intellectuals like in other European countries, which grew from their own national ground. Russian intellectual didn't arise from the folk and was far from it. That's why "*hated tradition, because tradition gives responsible and hard life without moral and intellectual excess…hated the past, was ahistorical* " [5;196]. Instead he wanted to create history anyway, but in his own way, by changing the net of police entities with the net of ambitious ecstatic fanatic-doctrinarians.

The whole government worked for repression of intellectuals in Russia. They were deported to Siberia, declared crazy, seduced with friendly letters and promises (Dubelt - Kulish). *"Groundlessness of intelligentzia – as we can read by J.Lypa, - emerged from different reasons: they weren't allowed to be in the government, were strongly separated not only from general population, but from real life at all. Alcoholism, sexual quests and lack of moral responsibilities – these are the only things, recommended by the St. Petersburg government their young students"* [5;195].

In his work "Purpose of Ukraine" Jurii Lypa uses the memories of his father's friend, the colonel I.F. Strus (1831 - 1910) about prominent Russian intellectuals, "aristocracy of Russian science and journalism". He believed that they don't have the strength of character and convictions, sincerity and generosity, permanency and unselfishness. He was shocked by depravity and dirt of Nekrasov in money matters, shameless thievishness of Panaev, cynicism and greed of youth's idol Chernyshevskyi. On occasion we should mention a very extensional, full and various Kostomarov's estimation of Chernyshevskyi in "Autobiography", in particular his atavistic atheism, as Kostomarov said "of this devil in human form", who's able to direct the whole legions of people in chosen by him direction and stand mockingly aside.

In Jurii Lypa's opinion Ukrainian intelligentzia has been forming on crucially different national and educational ground, where state tradition immanently existed as well as western

element in education and culture, traditions of Ukrainian village as source of cultural potential. "Communities", which have been functioning for decades before 1917 in St.Petersburg, Kyiv and further in other big cities got together according to national identity and were characterized by high morality. The later researchers of gendarmerie archives (L.Hrymalo-Sidlezkyi) noted that there were no police agents among communities members. The first feature of communities was high perception of historical mission of Ukraine; desire to preserve at least Ukrainian faith, art, moral climate, historical memories and language. Among other features of Ukrainian clerisy was "ant character" of work, everyday small efforts, which nevertheless gave precious result. Russian administration and police as well as Russian intellectuals often hindered them. This layer in his entirety despite appearing of numerous works is still too few present in modern social reception, in particular publicism.

As consequence of the work of Ukrainian intellectuals were institutes like Southern-western department of Geographical community, chronicle "Kyivska starovyna", Sunday schools, and wide-spread educational activity of community members.

Jurii Lypa evaluated this "ant-like" work high and wrote: *"How much more useful material we will find for creating our days by synthetics and analytics of Ukrainian spirituality such as Fedir Shcherbyna, Mykhailo Hrushevskyi, Dmytro Yavornytskyi, Mykola Kostomarov, Kost Kharlampovych, Stepan Tomashivskyi, B.Barvinskyi, F.Lazarevskyi, V.Modzalevskyi – there are many of them"* [5;199]. They knew how to hide this work in the most "protected" form in front of the administration, but under this form they were hiding the most dangerous content: smoothly, racial spirituality.

We won't clearly estimate Jurii Lypa's statements about Russian intelligentzia of that time, but still we'll note that they brighten up the social situation of that time as well as character of the environment where Kostomarov's activity was taking place, and it allows us to understand deeper the essence and meaning of his "Tysiacholittia" ("Millenium") for that time and for establishment of native nation-building thought in whole and in the future.

The focus of polemics on the level of strengthening of Ukrainians' separateness added the work of Kostomarov-publicist special emotivity, passion. This caused the metaphorical picturesque of his articles, other features of artistic expression: means of irony, sometimes sarcasm, dialogizing, speech "from the opponent" etc. Natural Kostomarov's patriotism together with his talent for writing defined the phenomenon of his artistic publicism.

Lack of spirituality Kostomarov calls a characteristic feature for inner world of many intellectuals of Russian empire in that time. The assertion of a part of intelligentzia that the society should follow the development way of civilized Europe, but Russia hasn't matured to it yet as its population is mainly young people Kostomarov answers as follows (meaning Ukrainians): *"Our drawbacks come not from our youth and also not from our disability to think and act – otherwise there would be no smart and talented people in Ukraine – but from too many and complicated social issues…We don't need ideals, we need the next practical tasks"* [3;128].

Kostomarov's ideas expressed in "Tysiacholittia" ("Millenium") were programmatic for Ukrainian intelligentzia and stay so till these days, especially when trendy for that time, but unacceptable for him liberal, actually pseudoliberal radical socialistic tendencies were spreading. In the situation of social stagnancy they got more and more like terroristic intentions and occurred further in practical forms, immoral in their core, often absurd from the position of future actions, they were highly destructive for national idea.

Kostomarov saw in the ancient Rus clear partition of powers on legislative and executive, which was an important force for development of Rus state, reserving active will of choice for the people. Later historical circumstances made the folk accept the authority of one state, to obey the supremacy of the state over right, which led to suppression of initiative, stagnancy and spiritual inertia. Kostomarov brings a thinking reader to the conclusion that monocracy becomes a deterrent on the way of spiritual evolution of the nation. Its elements came to Rus from the outside, through Byzantium and Tartarian conquest and contradict the mentality of Ruskyi (read – Ukrainian) folk.

Kostomarov gives broader argumentation about this conclusion: *"Despite otherness of our*

civilization and the civilization of our ancestry from the 9th century there is a lot in our modern origin that brings us closer to that distant epoch. If our modern state system has nothing in common with the everyday life of Kryvychi and Ilmenski Slavs then the world of our spiritual power, our concepts and desires can be compared with exactly the same chaos; the field of our spirituality and social activity is as big and broad as the land of our ancestry and we don't have order just as there was no order on that land" [3;130].

In "Tysiacholittia" ("Millenium") Kostomarov doesn't only analyze the attitudes and thoughts of his modern society, but also projects the tendencies for the future. Defining the problems of commoners of that time by fighting for national idea, emphasizing the role of the clerisy he criticizes dictatorship as deterrent of national progress of each ethnos in the empire.

The article "Tysiacholittia" ("Millenium") evokes thoughts about intelligentzia's role in the time of modern processes. No wonder that this problem takes a prominent place in the works of many modern philosophers, culture scientists, writers, whose spacious mind and character of national thinking are undeniable. The coincidence of their evaluations with the thoughts of Mykola Kostomarov makes the meaning of his publicism even more important and necessary to be learned by wide range of contemporaries. The reasonableness of Mykola Kostomarov's thoughts about content and character of the main tasks for Ukrainians, necessity of consistent solution of the most important for further progress and state development issues finds a bright reflection in the thoughts about "spiritual aura of the nation" by Lina Kostenko. The writer describes in her "Zapysky ukrainskoho samashedshogo" [2] on a broad panoramic social background perplexity of a modern intellectual against time ruthlessness and other globalism challenges. Dissecting modern problems in a misshapen mirror of spiritual nation's aura exactly those issues are stressed, to which Mykola Kostomarov paid attention in the article "Tysiacholittia" ("Millenium") and in other publicistic works in his time. This is another evidence of the need to use spiritual and ideological heritage of the publicist in modern conditions of state formation.

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A.A. Ivashchuk, PhD of Social Communications
(National Aviation University, Ukraine)

REPORTAGE-INVESTIGATION AS A NEW FORM OF JOURNALISM GENRE IN MODERN UKRAINIAN PRESS

This article explores the problem of genre innovations in modern Ukrainian press; examines definitions of reportage-investigation; emphasis on conditions of investigation journalism appearance in the world and particularly in Ukraine.

Scientific and technological progress did not evade journalism and led to irreversible processes: formation of global computerization, emergence of the Internet – all of which led to the emergence of new technologies for journalistic work, new trends in collecting, analyzing and disseminating information, variability and inter-crossing of genre forms.

We can oversee the processes that have the nature of Ukrainian journalism integration with European standards. In particular, such genre of journalism as reportage-investigation, which gradually transforms, distinguishing into a separate group of genres, get rapid and dynamic growth.

Reportage-investigation appeared in Ukraine in the early 90-ies of last century and is associated with so-called "restructuring" (“perestroyka”), the real processes of glasnost. Genre format immediately gained wide publicity among professionals and among the ordinary reading public. It was significantly different from the usual reportage-raid, by its acute relevance and even by its intransigence, though, actually, it was its classic follower. In addition, reportage-investigation methods borrowed collection of factual material, and most important, its interpretation of problem reportage, which also was partly a harbinger of a new genre.

Reportage-investigation exists and develops as a genre, but now we can talk about a new method of information and analytical materials writing, that received in the western journalist science the name of investigation journalism.

The main factor that optimized the active dissemination of journalism, first in the U.S. and later in Western Europe, became objective events that basically have a conflicting nature. An example of the so-called investigation journalism in the United States is the Watergate case. In 1964 the Pulitzer Prize Award Committee introduced a price for journalistic investigation. A bit later in the UK a series of publications that debunks the British government, showing the real extent of troops from the United Kingdom in the Iraq campaign appeared, and so on. For Ukraine, a classic example of the use of public documents and negotiations of the first persons of the state became snippets of tapes of Major Melnychenko published in press.

By carrying out journalist investigation state documents, which somehow came to the journalists, as well as the facts of an individual investigation, are actively used.

As for the terminological apparatus, with considerations of journalism expert M. Vasylenko fully agrees his colleague O. Glushko. The book "Journalistic investigation" was published several years ago and became a subject of debate among scholars and among readers interested in the problems of development of the national journalism. M. Vasylenko [1] and O. Glushko [3] in their works mainly focuses on methodology of A. Moskalenko [5], as a scientist paid attention to study such phenomenon of the Western press as "new" journalism, which, according to some parameters, was the prototype of investigation journalism. Under the "new" journalism A. Moskalenko understood literary form of material presentation that comes from America (Truman Capote) and was unusual for a West European reader. By combining reportage search and arbitrary interpretation of the facts, "new" journalism attracted the attention of the average reader by an unusual style, mastery in the depiction of events, where fiction dominated over conjecture, in general – full use of all literary devices. Now it can be certainly said that A. Moskalenko was absolutely right when he once predicted the transformation of so-called "new" journalism into a "language fiction" [5].

Now the problem of a journalistic investigation is mostly in the interpretation of group of facts. Since the days of free interpretation of facts, as sometimes the "new" journalism, are gradually becoming the past, we have completely new approaches, about which domestic and foreign scholars work.

Reportage is the most susceptible to transformation and variability, as far as it almost completely makes impossible the presence of borrowings from the artistic and journalistic groups of genres, and thus impoverishes the potential emotional impact on readers. According to French scientists' report: “reportage is at a disadvantage when it is overloaded with intellectual considerations, difficult comparisons, confusing associations” [2, 28]. By taking the analogy, we shall add that in this case, all journalistic genres lose, without exception. Professional experience and personal ethic and aesthetic preferences of the author let follow the golden mean in the approach to stylistics and architecture material. It is also clear that in the reportage-investigation and more widely in the methods of investigation journalism is absolutely impossible not to observe the degree in associative series, historical excursus. However, these components are essential when reporting, the investigation comes to the author's position on the problem, individual attitude to reality. This is supported by French experts, noting that the report seems to be a primary transformation of events with real characters, actions, decorations. Reporter introduces the reader as if to this performance, using a purely reportorial techniques.

So, ideally a reporter is working as a pioneer, sometimes initiating the writing on the basis of a single reporting of a a work of art. These facts are well known in the history of Ukrainian (P. Myrnyi, M. Kotsiubynskyi), American (T. Dreiser), French (P. Merimee, J. Maupassant) Russian literature (A. Chekhov, M. Gorkyi, I. Ilf and E. Petrov). Very many writers used facts of reportage, reportage sketches as the basis for future fiction.

Journalistic investigation requires adequate provision with illustrative line. And although variations of text reporting change and transform easily, photo reportage journalism of Ukraine develops slowly, being late for variations of text materials. Practical training of photographers is carried out mainly in editorial offices, that makes it impossible to talk about the elements of a comprehensive approach to this case; there is no exchange of information between build-editorials of specific publications, etc.

We should note that by working together, a reporter and press photographer (cameraman) must comply with the maximum tolerance and understanding. Industrial conflicts are impossible from this reason that the genre requires immediate response to changing events, therefore, there are no longer time to find out personal relationships. Therefore, such cooperation is not only the result of creative research or moments of "addiction", but also a strict discipline when each individual must respect the creative manner of his colleague. Often photo reportage is supplemented with text one, that sometimes even contradicts to it, but only to the extent necessary for a deeper analysis of the material.

Reportage-investigation, acquiring items of investigative method, constantly improves due to the fact that national reporters get acquainted with the best examples of foreign journalists. Appealing to foreign borrowing definitions of reportage-investigation, it is necessary to anticipate that their optimization will soon affect for the results of creative activity as well.

One of the definitions that belongs to French journalist science school, sounds like this: "The investigation is a difficult genre of journalism, which aims not only to put the problem, but also to prove something, to reveal a secret, to clear the truth. The work on the investigation requires the journalist to mobilize all his professional skills, thorough analysis of the problem, search of specific evidences” [6, 5].

Taking into account that definition and taking into consideration current theoretical materials, it is possible to define a reportage-investigation as a polyphonic journalistic work, which is based on investigative method and is implemented by bringing to the architectonics and style of journalistic work the elements of analytics, literary devices, which are typical for artistic and journalistic groups of genres.

Undoubtedly, the proposed definition is not meant to be exhaustive and is not perfect, as any

characteristic of the creative method. It should be added that the reporter, acquiring the investigation method, techniques of work should have a number of specific psychological and physiological characteristics. Here and there – to show personal courage to follow certain moral criteria, not to retreat before the threats and to be infallible when provocation.

To a reporter who works in the genre of investigation, now computers gains a special importance: "Contemporary specialist actually has on hand an informational source in the form of databases, where information is low discrete (low disjunctive) in space and time, accessible by information networks anywhere in the world; analytical device that helps the specialist to make decisions; diagnostic device that can monitor the situation on the interaction of a specialist with technological subject and adjust the action of a specialist; cybernetic device that can control the actions of a specialist via the interface device (speaker, printer, monitor, phone, etc.)" [6, 25].

The study of the nature of journalistic investigation raises the subject of images in modern cinematograph. One of the most popular arts promotes this method as much as possible, while promoting the latest innovations in the genre of reportage-investigation. It is interesting that the screenwriter of the series "Gangster Petersburg" is a Russian journalist A. Konstantinov – the author of the famous guide "Journalistic investigation" [4], popular among students and practicing journalists.

The scientific literature presents numerous definitions of the concept of journalistic investigation, but subjective approach dominates here. Thus, journalistic investigation according to the American researcher Robert Green is "a material, based usually on ones own work and initiative, on an important topic that individuals and organizations would prefer to keep secret" [7, 12]. Obviously, the American scholar had in mind an individual method, which is also adopted in investigation journalism, but, according to experts, is not effective. For a reporter is often unable to cross the borders of the state or personal secret; he / she has to deal with natural resistance. At the level of consumer awareness we often could saw that public servants, just guards overshadowed an eye of television cameras, tape recording captures cases of threats and curses to the reporters who are investigating.

It is clear that, under conditions of social tensions in modern society rising, general economic decline and the associated fall in moral, to conduct investigations on its own initiative is, thus, to condemn oneself to failure. Therefore, the practice of contemporary newspaper and magazine work gives us different, in fact, shared examples of reportage investigations. The book by A. Konstantinov, in particular, depicts an experience of a decade work of journalistic investigations agency, headed by the author of the work. Of course, advices and practical recommendations of the Russian journalist-scholar become useful for our domestic journalists as well.

The Russian scientist M. Shyshkin points out that methods of journalistic investigation are interpreted in different ways in society. It is objected and accused by the representatives of power structures that are designed must take care of the law. The others see in the investigation the only way to solve the problem and get the truth. The authors of the book "Journalistic investigation", rightly point out that the priority of the journalistic profession is not hunting for criminals, but informing the society about the objective situation, showing the facts of our rights distress [4].

So, summing up, it can be specified that a reporter is not only an observer of events that happen, but also he / she had, while being in the epicentre, de facto be the subject of the event. Of course, journalistic investigation as a genre in Ukrainian journalism is still in the formation stage. It requires further research. Since the journalistic investigation for today is one of the most popular genres of journalism, without which it is impossible to imagine modern media.

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V.M. Vasylchenko, Ph.D. (National Aviation University, Ukraine)

RITUAL PHRASEOLOGICAL UNITS IN THE INTERNET MEDIA

In the article is taken a view of the ritual phraseology functioning in the Internet media, ascertained the place of phraseology in the system of language, determined the character of phraseological nomination, and described the figurative nature, stylistic potential of ritual phraseological units.

One of the most important sign systems is a verbal sign system, historically formed natural human language. Being in close connections with the traditional ethnic culture, the language of each people as a form and one of the key components of culture reflects the special features of its collective consciousness extremely.Simultaneously language description as a cultural and historical phenomenon is impossible without learning the language links with one of the nation-forming aspects of cultural and national life – ritual reality, which is a very important element of culture –an integrated variety of human life. «Rite» is defined by tradition (custom) accompanied by verbal symbolic-conditioned, deprived of the practical feasibility of actions, which sacral express the escort and make out important points relating to different areas or periods of social life: family (birth, wedding, funeral, etc.), calendar, military, religious ceremonies, etc.; repeat the sacred patterns of behavior and are directed to achieve practical (pragmatic) goals.The rite is a genre of folk culture, one of the ways of mastering the surrounding world, a means of regulating social behavior and maintain stability and transmission of cultural traditions from generation to generation, which was performed by use of certain cultural models and patterns, the way of protecting from the evil forces or damaging enemy, an attemp to foresee the future and so on. The rite is a means of restoring, enhancing the former existence, it is related to the act of creation; during the ritual service we have structural and semantic reproduction of that which was created in the creative act; repeated its experience; linking «here» and «now» with «there» and «then».

This ensures the continuity of human existence in the world [11]. The first model of the rite and its essential components are defined by the community like from the ulterior world or a being that belongs to both – this and the other world. Thus, the rite is not fabricated by people; it is dictated in its basic outlines from the beyond and then is a precondition of communicating with it. Therefore, the ceremony in human life under the mythological (archaic, ritual) mind occupied one of the most important places. Proof of this is the strict abidance of ancestors` customs and traditions of ritual celebrations by society, which in the minds of both participants and their agents, and other members of society was seen as a key to its existence in the future by agreement through the life with the ritual actions with all worlds of archaic universe, spiritualized nature and higher forces. According to researchers, sociocultural model of formation mythological (ritual) consciousness «did not extend beyond the evolutional type and had its base the direct meanings of life, aimed at the nature and sociality as a condition of being a human in the world, and more important – the approval of the most viable ethnic groups» [10, p. 90-91]. The ritual scenario provides for a clearly defined sequence of corresponding symbolic actions, communicative acts and the roles distribution of participants.

Occupying a leading position among the national-specific components of culture, language stands as one of the brightest representations of national identity. Considering the language the soul of the people, the researchers soul language correctly determine its phraseology as phraseological structure is a striking and original bearer of national and cultural features of the language system. Peculiarity of the process of phraseological nomination as a secondary semiosis is so-called «renaming»: phraseological unit appears as a result of rethinking semantic pattern that leads to transfer of the already famous names a reality in object semantic reinterpretation. During the accrual of the phraseological unit its genotype passes the way to a new name of semantically reconsidered denote, in which the collective consciousness of language found similar to genotypical denoted shaped signs on the one hand, and on the other – the evolution of language consciousness

raised a linguistic system to the need of the secondary semiosis. Symbolic plan of the certain object transferres to a different object, so the object becomes a symbol of the primary object of symbolism reality is transferred to the symbolism of its name. «So far as the imagery is embedded in the language itself (compare with personalized expressions: *дощ іде* («rain falls»), *вода прибуває* («water comes»), *роса впала* («dew fell»), *сльози котяться* («tears are rolling») then each new word-usage interact internal image and significance as realization of the first» [13, p. 12].

Idiomatic expressions are one of the inexhaustible sources of strengthening and deepening the logic of the presentation, so authors often resort to them in journalistic style. Emotionalism of the phraseological units closely relates to their expressiveness. When comparing phraseological and non-phraseological names of the same concept, it clearly appears distinctness, more expressivity of the first ones: *і ладаном не викурити – «не вигнати»* (not to expel by incense – «not to banish»)(*«Совдепівщину» з наших чиновників* ***і ладаном не викуриш*** («The Soviet Time does nott expel by incense from our officials») (http://www.wz.lviv.ua/articles/107414).

Idiomatic expressions carry peculiar features such as imagery, emotionality, evaluation, expressiveness. Imagery is a dominant feature of phraseological units, is their aesthetic value. In journalism and literature Idiomatic expressions are used in the author's speech, make it more diverse, beautiful, full of emotions and characters as a means of their characteristics.

Ritual phraseological units (RPU) are allocated within phraseological subsystem. These include units, donor area of which supports the creation of ritual sphere of society. Recorded in written sources, these units demonstrate the connection of marriage and burial ritual, rite of baptism and the magical ritual practices.

RPU, as a product of the ritual reality and ethnic community, belonge to those units of language that clearly illustrate the correlation between language and culture so far as «ceremonial discourse, like no other, demonstrate the functionality of the mental correlate (unifying concept), words and things, and things apparent, which further enhances the magic of the word-symbol» [6, p. 60].

Analysis of the ritual phraseology allows to find one aspect of the language creating position of «a person, his orientation in the world of entities» [3, p. 311]. Thus, in the phraseological system of the Ukrainian language is a significant amount of phraseological units, motivational elements (derivational base) which is the ceremonial life of our ancestors. That is why, the rite, actually, its verbal code is, by the way, a source of phraseology.

RPU is wide used in the Internet media. Here they function as a powerful means of expressiveness, providing texts bright figurative meaning. The distinctive stylistic potential has historical background, which formed phraseological unit, and echoed in the form of an external unit. The use of RPU in the text alongside with nominative-semantic function and expressive loads translate ritual picture of the world, refers the reader to the ethnic history: *У Львові комуністи та антифашисти «****поцілували замок****» на дверях свого конгресу* («In Lviv, communists and anti-fascists «kissed the lock» of the door of their congress») (http://gazeta.ua/articles/politics/_u-lvovi-komunisti-ta-antifashisti-pociluvali-zamok-na-dveryah-svogo-kongresu/406779). Phraseological unit *цілувати / поцілувати замок* («to kiss a lock») means «to come to somebody and not to catch the hosts at home». From the ethnological studies is known that the lock in the life of Ukrainians was fairly common thing. Besides the profane importance it was also sacred. According to Ukrainian beliefs, in the spring when there is the revival of nature (a new cycle of life starts), land and water open; which seems to enjoy the evil forces, including witches, which used to kiss a lock on Easter, that was the church door locked with, purposing to unlock a cow`s udder by magic. There is also the custom of kissing the church`s lock by brides during the wedding (that was, certainly, done with well-intentiones) [7, p. 235]. D. Zelenin connects the origin of that phraseological units with Ukrainian wedding ceremony to kiss the church`s lock before marriage banquet in which the bridegroom rode through the village. The structure of the Polish wedding ceremony included kissing the lock of the house by bridegrooms [1, p. 199]. Or a phraseological unit *заварити кашу* («to brew a porridge») – «to start something very difficult, troublesome, threatening unpleasant consequences»: *Хто і для чого* ***заварив кашу*** *у сфері музичного бізнесу, дізнавалася*

Олександра Сльозко («Alexandra Slozko was finding out who and why brewed a porridge in the music business area») (http://www.musicliga.org/ru/about/ press/224.html»). «Porridge» in ancient times signified food in general, so the word had a more general sense, it was widely used. By the time the statements *заварити кашу*, *заварилася каша*, *з ним каші не звариш* were not syntactically free [12, p. 117]. In time the porridge was used as a ritual meal: it was cooked to celebrate all important calendar and family celebrations. These ritual celebrations connected with more people, often accompanied by some disorder, because people's perception takes the porridge as a symbol of troubles, worries [7, p. 278]. Researchers of Russian phraseology also claim that the ancient ritual performed porridge dish, which was necessarily, particularly at weddings; they ascertain the presence of ancient word «каша» («porridge») meaning «the wedding feast», and the compounds *чинити кашу* («to make porridge») – «to arrange a wedding feast». Obligatory presence of porridge at the celebration determined the fact that it symbolized the fertility. That is why such «клопітливі каші» («troublesome porridge») with the participation of large numbers of people and difficult construction of ceremonial events motivated appearing of a phraseological unit *заварити кашу* [1, p. 257-258].

Significant stylistic potential hides before-idiomatic semantics of archaic phraseological component. Its knowledge allows to play the internal form of a phraseological unit, to understand the way of creating an image better, on which was reinterpretation the genetic prototype of a phraseological unit in a stable and reproducible language unit, to look through it to the boundless world of national culture, to acquaint with the fragments of the ethnic picture of the world, sent by a linguistic means, to unwrap the phraseological «cover». Appeal to the semantics of archaic phraseological units` components can help to understand the value of them better, creates the preconditions for its «propinquity «to the native speaker, «recognition» by him, make the process of memorizing a unit «convenien», which facilitates its use in normative discursive practice.

So, in the phraseological unit одним миром мазані (smeared with the same myrrh) – «very similar mostly in negative meaning // about people with similar defects» clearly stands out a component «myrrh». «The word «myrrh» means used in ceremonies of the Christian church fragrant oil. The rite of confirmation carried out with it. It was implemented in order to give man a divine grace. The essence of this rite «is smearing believer's forehead, eyes, ears and other parts of the face and body with aromatic oil – myrrh» [2, p. 525]. The use of appropriate RPU quickens in the recipient`s imagination an illustration of the ritual reality, particularities of the rite or partakerof a procession, giving an image drawed in all its details: *Чиновники* ***одним миром мазані****. І лікуються в одних клініках* («Officials are smeared with the same myrrh. And are cured in the same clinics») (http://siver.com.ua/news/chinovniki_odnim_mirom_mazani_i_likujutsja_v_odnikh _klinikakh/2011-03-04-7327). The same could be said for a number of other units: *Моурінью* ***дав обітницю*** *мовчання на знак протесту проти дискваліфікації* («Mourinho gave a vow of silence to protest the disqualification») (http://zik.ua/ua/news/2011/05/09/286473). A unit *давати / дати обітницю* («to give a vow») means «to swear, renounce». The word «vow» is used to name a pledge, commitment (mostly religious) [5, p. 405]: *Якому б місяцеві ми не* ***співали осанну****, останній брат весни все-таки має особливі заслуги* («Whatever the moon we sing hosanna, the last spring`s brother still has special merits») (http://www.utr.tv/article/?id=236). Customary in phraseology *співати (вигукувати) осанну* («to sing (exclaim) hosanna») – «to praise, someone (mainly unfoundedly)» component «hosanna» literally means «save» and has the following meanings: «1) prayerful exclamation of the ancient Jews and Christians, 2) praise someone, something; glory, praise» [5, p. 421].

The use of RPU can embellish text with appropriate expressiveness. Thus, the units formed in the area of church ceremonies, providing text with high-sounding: *Жлобно* ***правити тризну*** *за померлими від голоду 33-го в Оперному театрі* («Zhlobno» [≈unacceptable. – V.V.] to make funeral feast for the dead of the famine of 33th at the Opera theatre) (http://www.istpravda.com.ua/columns/2011/04/9/35061/) // *правити тризну* («to make funeral feast») – «to make mention of dead, to give a funeral banquet». Phraseological units, which «etymological» element serves traditional rituals, bring components of neutral or debase sounding:

Коли дідусь із бабусею ***прийняли старостів*** *від Миколи Юськіва, мого тата, то домовилися, що мама йде в невістки* («When grandfather and grandmother took the matchmakers of Mikola Yuskiv, my dad, was agreed that mom would become a daughter-in-law») (http://vilne.org.ua/index.php?option=com_content&view=article&id=7535:ya-sumuyu-za-vamy&catid=19:post&Itemid=26) // *прийняти старостів* («take the matchmakers») – «to agree to give a daughter in marriage, consent to marry»; *Щоб не* ***сісти у чужі сани****...* («So as not to sit in somebody else's sleigh…») (http://www.kreschatic.kiev.ua/ua/2938/art/34605.html) // *сідати / сісти (влізти) не в (на) свої (чужі) сани* («to sit in somebody else's sleigh») – «to take somebody else's case; occupy an inappropriate place at work, in society, etc.». Especially clearly it happens on the background of high-sounding phraseological units: *Цікаво, що* ***«золота акція»****, на яку так розраховують свободівці, їм може* ***піднести гарбуз*** («Interesting, that «golden share» which svobodivtsi so rely on, can offer a pumpkin») (http://www.pravda.com.ua/rus/columns/2012/06/18/6966937/view_print/). All in all, metaphors of colloquial phraseological units lead to a high degree of expressiveness: *Українського вболівальника* ***винесли ногами вперед*** *з матчу проти Сербії* («Ukrainian fan was borne out of the match against Serbia with feet ahead») (http://gazeta.ua/articles/sport/_ukrajinskogo-vbolivalnika-vinesli-nogami-vpered-z-matchu-proti-serbiji-foto/217531); *Вибори позаду, владна вертикаль побудована, закон про референдуми прийнято, «тушки» інвентаризовані — ніщо не завадить урядовій коаліції* ***вбити осиковий кілок*** *у напівмертве тіло українського малого бізнесу, головного класового ворога компрадорської буржуазії* («Elections are behind, power structures are built, the law of referendums is passed, «carcasses» are inventoried – nothing could prevent the alliance to drive an aspen stake in half-dead body of Ukrainian small businesses, the main class enemy of usurious bourgeoisie») (http://www.ukrrudprom.ua/digest/Ostann_dn_ malogo_bznesu _v_Ukran.html); *У Азарова гарненько* ***перемили кісточки*** *Черновецькому* («At Azarov were thoroughly washed all Chernovetskij`s bones») (http://ua.for-ua.Com/politics/2010 /10/18/192520.html)

In some situations of usage RPU there are even pieces of ceremonial script: *Сама Юлія Володимирівна цього разу* ***«колупала піч»****, її ж «свати», як то Олександр Турчинов і Микола Томенко, стали наввипередки повідомляти громадськості, що прем'єром може бути тільки Тимошенко, тому що «так хоче народ»* («That time Julia herself was «picking an oven», her «matchmakers», such Alexander Turchynov and Mykola Tomenko were racing in informing the public that only Tymoshenko can be the Prime Minister because «people want to») (http://www.chas.cv.ua/07_06/11.html) // *колупати піч (комин)* («to pick an oven (chimney)») – «1. To perform ritual action during the matchmaking (about a girl). 2. Be ashamed».

RPU as the rest phraseological unit in general may experience transformation: *Політолог розповів, як регіонали самі не раді, що* ***заварили «мовну кашу»*** («Political scientist retailed how the regionals not happy themself that brewed «linguistic porridge») (http://rss.novostimira.com/n_2780628.html). Compare with canonical unit: *Але зробили це так безцеремонно, нахабно і по-дикунському,* ***заварили*** *таку* ***кашу****, що, схоже, тепер і самі не знають, як її розхльобувати* («But did it so unceremoniously, arrogantly and savagely, had brewed such a porridge, that it looks like now trhey don`t know how to ladle out»). (http://www.wz.lviv.ua/articles/107794). Type of a ritual that became motivational background for RPU, defines «disposition» of the context sounding: *Зірки «Сутінок» збираються* ***стати під вінець*** («Stars of «The twilight» are going to stand under a wreath») (http://24tv.ua/home/showSingleNews.do?zirki_sutinok_zbirayutsya_stati_pid_vinets&objectId=228435); *КС ухвалив рішення, яке може* ***поставити хрест*** *на плівках Мельниченка* («CC adopted a decision that could to put a cross at Melnichenko`s tapes») (http://zib.com.ua/ua/5919-proslushka_z_garantiyami.html); *«Похмурі тіні»: любов* ***до гробової дошки*** («Gloomy shadows» love to the coffin board») (http://ura-inform.com/uk/culture/2012/05/11/mrachnye-teni-ljubov-do-grobovoj-doski-video); *Допомога будівельникам:* ***«як мертвому кадило»*** («Help for builders: «as thurible for corpse») (http://www.epravda.com.ua/news/2009/01/16/177877/); *У США* ***останню шану віддали*** *Роману Купчинському* («In the U.S.A. gave last respects to Roman Kupchinsky») (http://chm.plast.org.ua/news/212-u-ssha-ostannju-shanu-viddali-romanu-kupchinskomu.html).

Conclusions

Thus, the study in a means of nomination field, that deeply reflects features of ethnic existence – ethnography units (ethnical lexical and phraseologycal units) – semantics of which marked by a variety of extralinguistic symbolic layers, supersystem connections and archaic oppositions, on comparatively wide ground of their ethnical, cultural contexts animates studies in etymological and historical areas of linguistic research.

Here can be added only historical aspect of understanding the ethnos life in diachrony. However, a strong connection of ethnography units with the most important areas of ethnic culture (everyday and ritual) makes highly important the scientific significance of the results of these investigations so far as they create conditions for more general summarizations about the sources and multilateral, multilevel characteristics of material and spiritual culture, also ethnic world outlook. At the same time it gives wide scope for stylistic use of these language forms.

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I.V. Kevlyuk, Graduate student
(National Aviation University, Ukraine)

CONCEPTUALISATION AND PRAGMATICS OF THE SOMATISMS IN JOURNALISTIC TEXTS

In the article are investigating the feature of functioning of phraseological units in newspaper publications. I tne article made the conceptually-pragmatic analysis of phraseological units with a somatic component in the texts of Ukrainian-language newspapers and other modern mass-media; it was found out the specific of phraseology symbol.

Phraseology is a mean of language, and thus, and literatures, and publicisms. Phraseological unit - not simply proof connection of words, not simply language and stylistic means, but utterance, in which represented mentality of nation, her perception of the world, culture. Will consider phraseology units exactly in this aspect. There is duty global reformation of norms of modern literary Ukrainian in this time. If in relatively to the recent past basis and legislator in creation of norms of words usage was artistic literarture, then in the last years this role legally belongs to the mass-medias, publicism genre. This genre is most near to the natural language which lately is more noticeable influences on the literary norm of Ukrainian. Coming from the above-mentioned, the theme of the article sounds especially topically.

Phraseological unit or phraseology unit is named proof combination of words, which are grammatically organized after the model of word-combination or suggestion. Phraseological units are characterized by semantic continuousness of components, integrity of value and automatic recreation in broadcasting. Possibilities of phraseological unit go out outside a language and arrive at the borders of vivid logic. Phraseology unit is not only comfortable in a recreation, – she is part of associative row. Every people have the character, signs, clear each without interpretation set. Using them, the transmitters of language create the offenses, which accessible to all and at the same time is compressed. It has the special value in-process facilities of mass communication, which try to give possibly anymore reports for as possible for more wide audience.

Somatic phrasem is two-top impredicative phraseology unit, the key onomasiologicly component of which is somatysm (name of part or organ of body of man) [12: 5]. Phraseological units with a somatysmic component were investigated by such scientists, as M.Alekseenko, L.Duachenko, A.Ivchenko, V.Vinogradov, D.Ushchenko, V.Koval, O.Selivanova, V.Kononenko, M.Kochergan, O.Andreyichenko, A.Archangelska, M.Gordy, O.Karakucya, Y.Miloshyn. **The purpose of the real article** was to carry out the detailed description of Ukrainian phraseological units with a somatic component in journalistic texts, to find out the specific of phraseology symbol, set phraseologucly-buildings activity of somatic component, give the analysis of the investigated phraseology units in conceptual and pragmatic aspects.

First in linguistic everyday life a **term „somatic”** was entered in finnish-hungarianistic of F.Vacc, which investigated phraseological units of Estonian with the names of parts of human body and named them **somatics**. He drew the conclusion that they are from the most ancient layers of phraseology and fold the most consumable part of phraseological units of Estonian. Terms **„somatysm”**, **„somatic”** have the different interpretations. According to wide interpretation, somatysms, somatic [*from Greek soma (somatos) – a body*], are facilities of denotation of the phenomena which behave to the sphere of corporalness. In more narrow sense, somatysm is any meaningful sign, provision or motion of person and total-body of man [E.Vereshchagyn, V.Kostomarov], id est a term, which embraces all forms of one of unverbal languages – somatic language, which includes gestures, mimicry, poses, expressions of persons and various symptoms of heartfelt motions and states.

A term "somatic" is used in biology and medicine in the value of ”link with the body of man, corporal” and matched against a concept “psychical”. In linguistics he begins to be actively used from the second half of 20th century in researches, which represent in the semantics all that

which behaves to the sphere of corporalness.

Authors of works on culturology and sociolinguistics [M.Bakhtin. I.Con, M.Fuko and other] mark those historical changes which took place in consciousness of people and in a company in relation to the valued party of sphere of corporalness: from open confession of cult of beauty of human body in an ancient epoch, through prohibition corporalness in the period of early middle ages, making of new contradictory canon of corporalness in renaissance age, strengthening of corporal discipline in the period of origin of capitalism which attained a peak in a victorian epoch, to the rehabilitation of human body removal of existent prohibitions on the displays of corporalness in a modern culture.

The comfort of phraseological unit with a somatic component consists yet and in that he can change, and thus used and sound othergates in journalistic text. This property is necessary for today's informative space which wants a variety and new forms. Metaphorical, emotionality, expressivity – all these internalss of phraseology units give a vividness and expressiveness to the language. Undoubtedly, special duty phraseological units are performed in texts of mass medias, especially in newspapers. Professor G.Vinokur marked that newspaper text as a matter of fact through "phraseologicly", as standardness, "cliche" many typically newspaper utterances is inalienable property of language. In the language of modern mass-media phraseological units can yield different sort of transformation with the purpose of strengthening of expressiveness and emotional influence. Newspaper practice produced the certain receptions of similar modification of proof word-combinations already. Clearly, a purpose of journalist – to pick up a well-aimed, bright word – would be extraordinarily simple, if all receptions can it was be used mechanically. But not by chance Otto Yespersen (known Danish linguist) named phraseology a "capricious and elusive thing": practically every word in composition of phraseological unit in one or another measure changes the semantics. Changes first of all depend on that, as far as closely words "grind" in to each other, id est from the degree of monolithic nature of components. [7: 44]

In the conditions of informative market, hard competition, fight for the reader of mass-media aim as possible more attractively to "design" the products, id est to bring information in most bright, characteristic, that is memorized to the form. Registration of maintenance of information is the so-called linguistic game, intellectual limbering-up which comes into the notice of readers, for what at the stowage of texts it is necessary to pick up bright, noticeable, witty expressions. To result in deployment of phraseology material.

A select theme is of interest for us from the point of view of features of the use of phraseological units with a somatic component in the language of modern printed and electronic mass-media, namely, possibility of transformation of phraseological units at avoidance of stylistic errors.

Persuasiveness in publicism texts is arrived at by journalists due to the use of emotionally-expressive language means among which after frequency model phraseology units from components-somatysms. Such phraseological units occupy a noticeable place both in a language publicism texts and in a general phraseology dictionary. After supervisions of R.Vinetraub, they present near 30% of phraseology composition of any language [4: 162].

The symbolic of somatysms of man has religious sources and predefined naively by the anatomic picture of the world of old man. N.Arutyunova considers that a symbol has higher semiotics status comparatively with character and metaphor, as his setting – to combine effort publicly-pedigree and national collectives. Y.Lotman named a symbol of **"memory of culture"**, in fact most symbols are related to the old ceremonies, rituals and traditions of people, which fix informative згортки of the family past [8: 47]. In relation to the somatic code of culture – then he one of the oldest. A somatic code is correlated with archatypicly presentations of the people, that, in opinion of O.Silivanova, is the "method of mastering of the world by a man – germeneutically circle from itself to itself and extrapolation of this circle on the environment" [10: 83]. Anthropocentric principle is of a long time ago enough the article of research of national culture, language. Yet D.Ovsyanyko-Kulikovsky wrote, that a "art … aspired to the recreation and cognition all human, it – anthropocentric and redoes all sum of feeling in the norms of human psyche" [9: 343-344]. After the

postulate of V. von Humboldt "a man thinks, feels and lives only in the language" [6: 378].

An anthropocentrism of phraseology is an orientation of proof units on denotation of the world of man. Thus important role belongs to somatysms in the nominations processes of the subject world – to parts of human body. Unicity of man, from the linguistic point of view, not only in her intellectual or heartfelt internalss but also in the features of her structure and in the functions of parts of body, which are indissolubly related to these internalss [3: 523-525]. Exactly phraseological units with somatic components bring in journalistic works the colour of national humour, irony, sarcasm.

In journalistic texts the structural types of FU are registered with such comonents-somatysms, as an **eye, chairman, ear, hand, leg, throat, rib, heart, face, carried, mouth, five, a tooth, hair, shoulder, mouth, breasts, lips, lived, umbilicus, neck, bones, backbone, body, that´I, bowels, blood, saliva, finger, throat, tongue, liver, brain, back, tears, knee, stomach, party, back of head, hump, soul, nerve, fist and others like that**. Among somatic components such out-of-date words are used, as **mouths, brow, finger** and others like that. Count everything 50 components on denotation of parts of human body, which are used in broadcasting of Ukrainians on the modern stage. A supervision above semantics and functional loading of the adopted phraseological units allowed to distinguish units with the general or near values [1:8].

Will stop more detailed attention for phrasems with a component *EYE*, which marks, except for the spectrum of visuognosis, the objective estimation of reality, certain situation and others like that. Syntactic супровідники of соматизмів add to the predicates maintenance, character, method or quality various conotative tints: ***to gorge eyes*** – to be all eyes, ***to hurry eyes*** – to look quickly, ***to slide eyes*** – to look on the way. Functional adaptation of somatysms does them the signs of metonymy of different actions, states of man, the additional signs of which are passed in phraseological units by the way of metaphorisation of their components.

Phraseological unit "***of eyes at Syrko* to borrow***" a value to "lose sense of shame, own dignity" [PDU, b. 2, s. 662]. A context certifies realization of this value, to compare: "*And too a government is disturbed by that from a promissory ugliness budget-workers suffer more than workers of the private sector. Id est the state, is borrowing eyes from Syrko, again mind "hands" over it*" [UM: 07: 02].

Phrasem with a component *EYE* in publicism texts can be used in the value of "support corporate solidarity", to compare: "*Poteben`ko to Kravchuk* ***an eye will not peck***" [UP: 28.12. 2000].

With the value of accentualisation on an object or subject in journalistic works used and phraseological unit **to strike in the eyes**, to compare: "*Really, even, except for the terrible state of the field,* ***strikes in the eyes*** *the noticeable fatigue of guests which conducted the past ...*" [UK: 22.03.2011]; "*That foremost* ***struck in the eyes*** *– high standards of service: here a personnel is able to smile, to be the patriot of the establishment*". [UK: 29.03.2012]; "***In the eyes strucked*** *slipshod street, middens, in fact a market hung around* " [UK: 02.11.2011]; "*Among of that time party documents* ***in the eyes are strucks*** *the program of Folk party of Ukraine*" [DT: 13.01.2012]; "***Strikes the eyes*** *circumstance that only 43 boarding-schools (28%) are located in cities, and other 108 (72%) – in the separated farms, settlements and settlements of town type*". [DT: 06.07.2012].

Opposite of relation to "to hide a true – to open a true" pass phrasems **to expose // to open the eyes of the people, to wipe the eyes, to close the eyes, to screw up the eyes**. In the investigated texts considerable part of adopted PU is using with a value "to open a true about someone, about something", to compare: "*Well and the financial reporting will in future very decorate, while a regulator will kindly* ***close the eyes*** *(in particular in the extra charge of backlogs under problem credits)*" [DT: 26.08.2011]; "*All together we must help him to undertake the first steps, guard from falling,* ***expose the eyes*** *on the world, to teach to love the people"* [DT: 19.08. 2011]; *"How can God* ***close the eyes*** *on such?* " [DT: 30.03.2012]. O.Andreyichenko marks however, that in some analysable texts these phraseological units are often pointed in quotation marks which are the index of the ironical use of these utterances, more precisely, expression of enantosemical maintenance, to comoare: "*the best mean to scupper a rival is to "****open the eyes to***

***the people**" on those or other moments of his biography. Well if "sins" a candidate have really, but if it is not – also not misfortune"* [UM: 03: 02]; "*All right, will **close eyes** on that from this event (really a patient, ill woman, drives away in an ambulance to the hospital) we did a political show again. Well it or badly – not to get used to such, but stubborn thing tradition*" [UK: 03: 01].

In the etnoconsciousness a partonym *EYE* is the most value of man, which needs to be saved: **to save as an apple of the eye; who the old will pass, that is why eye away and others like that**, to compare: "*a vice-president to American **are saved as an apple of the eye** and keep in a severe secret the plan of his moving*". [DT: 10.11.2001]; "*In general, technological secrets are a main secret of any enterprise. She **is saved as an apple of the eye***". [DT: 29.03.2002]; "*Indisputably, national acquisition it follows **to save as an apple of the eye***". [DT: 14.06.2003]. O.Andreyichenko however in some publicism texts, where the marked appear higher phrasems, again traces an ironical estimation exactly, for example: "*With the "multivector" of Ukraine (even at the level of rhetoric) will be finished. Nobody will reminisce absurd attempts to integrate to some there Europe or NATO. Ukraine will become the full-fledged member of the CIS, EuroAisEC and as **an apple of the eye will save** friendship with brotherly Russia, Belarus and China*" [US: 11: 02]; "*At first, country's leader in age, select unknown when and unknown how, (**who the old will mention, that eye begone**) by a trues and lieses finally became firmly established in the him force*" [UM: 05: 02] [1].

Phrasem with a component an *EYE* is used also in a value "somewhere". "*Because if people will bite through, that Yatseniuk is continuation of Yushchenko, then to the cat under a tail such "Front zmin". People would have "to guzzle" so – he drove out him, that is why that opened front against him. Here such here **dust - in the eyes** of nation"* (www.speckor.info/news/2009-07-21-77).

Exactly a man, due to the unique among all living to possibility to talk and write, fixed in verbal formulas peripeteias and varieties of love and also realization of this all-embracing sense. All begins from caring for and conquest of favour: *to sharp the eyes, to ogle*.

Humorously shows phraseological units by means of their partial transformation. Hereupon such titles appear: "***Sees an eye**, but something with a tooth*", "*Chorny Brother`s **take again laid an eye** on Ukraine*", (http://www.pravda.com.ua/news/2000/12/28/2981571/), "*Eye for an eye*" (http://focus.ua/politics/ 237299/), ***At Sirko lent the eyes** and indifferently*. (http://www-ki.rada.crimea.ua/index.php/-i/ 4254/). Transformation of phraseological units helps to create modern phraseological unit, original and unique which will come into the notice of reader emotionality and expression. A phraseology title is in addition, transformed in combination with subheadings facilitates perception of text with large and difficult informative mass.

Thus, actually Ukrainian phraseological units more natural, more euphonic and more near and more clear to the reader. The transformed phraseological units are the mean of balancing of logisation will expound and publicism vividness. In addition, phraseological units carry out the role in the technicians of mass-media. Phraseological units with a somatic component come into the notice of readers, approach heavy for perception text to the audience of any level, deepen maintenance, give additional tints to the concrete theme. Built on mental features, general historical experience, phraseology units with a somatic component call to community of ideas in perception and understanding of information.

In a linguistic arsenal there are quite a bit methods, methods, facilities of influence on a reader. Phraseology units – most powerful among them. And him deep psychological aspects it follows to study.

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Conditional reductions:

1. DT – a newspaper "Dzerkalo tushnya";
2. ZMI – the mass-media;
3. DPUU – Dictionary of phraseological units of Ukrainian;
4. UK – a newspaper "Uryiadovy kur`er";
5. UM – a newspaper "Ukraina moloda";
6. US – a newspaper "Ukrainske slovo";
7. UP – a internet-newspaper "Ukrainskayia pravda";
8. PDU – the Phraseology dictionary of Ukrainian;
9. FU – phraseology units

G.I. Nazarenko, Candidate of Philological Science,
(National Aviation University, Ukraine)

CONVERGENT JOUNALISM: TRENDS AND MANIFESTATIONS IN MODERN UKRAINIAN MEDIA PRACTICES

Digital revolution in the media led to the turn of XX-XXI centuries before the emergence and development of new trends that are forcing traditional media to change the strategy and form of the endangered. Fundamental changes in lifestyles and patterns media consumption, total media coverage and computerization of various sectors of society are drivers (drivers) adaptogene transformation of both international and national media landscape.

Convergence journalism is one of the newest trends generated by electronic era. Convergents (from Lat. *convergens*, *convergentis* – one that converges, approaches) are the elements of one language or several languages, which converge in the process of historical development of language, which converge as a result of direct interaction. The phenomenon of convergence (convergence, "climbing" a completely different phenomena under the influence of the general laws of social development) is observed in linguistics, biology, ethnography, medicine and other sciences. Recently begun to record and interpret this phenomenon as theorists and practice of modern journalism.

Speaking of the convergence phenomenon in the modern media, most authors cite the definition of the famous American scholar, professor at the Massachusetts Institute of Technology Itiel de Sol Pool, "Convergence - the elimination of boundaries between media as a means of mutual communication such as telephone, mail, telegraph, and as a means mass media such as newspapers, radio and television "(1987). Over the past decade due to progress in computer technology, computer speakers and computer networks as a means of updating the broadcast took place convergent processes. Modern technologies allow to combine in a variety of media communication that was previously impossible. Thus, visual, text and audio (verbal) information will no longer focus on one of the classic media, and may appear simultaneously in all forms of journalism. Thus, the sites of newspapers appear sound and video news reports, and printed pages - texts are taken from blogs, forums, social networks. On Web sites, radio - extensive article, commentator column photo stories. Television talk show can be viewed online with infographic, articles and blog TV presenter. Thus, there is convergence - the elimination of boundaries between different types of media and their actual approximation, even merge against the latest technological capabilities. Before our eyes is a global change established for centuries and decades of mass media forms, the modernization of the classic incarnations journalism.

The main trend in this line is the transformation of traditional media which are forced to change, to become other, to adapt to the needs of modern audiences, the media. There is a steady increase in visual and entertainment component of the mass media. Medial audience consistently goes the text of thought, word perception and analysis of events to figurative thinking, perception and analysis. You can talk about the total and continual visualization of all types of modern communication. Laid was the trend back in the second half of the twentieth century, during the active development of television, its transition to a color format. In addition, new printing technologies have given new impetus to promoting well-illustrated publications - newspapers, magazines, newsletters, posters. Popular newspapers are gradually moving to the "tabloid" (reduced) format, acquire hybrid forms (such as the illustrated newspaper and magazine newsletter), try to reproduce the facts in a television broadcast, and present in expanded form in the Internet space. Some editorial publications, recognizing the general trend, in which they develop, and somewhat apologetically for excessive illustration, say that their media format - "TV on paper." In addition, they urge their readers to view online at their website videos a particular article. TV, in turn, turn to the audience with a proposal to read and view more detailed information on their website.

A new era of computer and related convergence brought dramatic changes in media practice

overall role and activities of journalists in particular. The main source of information, unlike previous eras functioning of the media, become mobile and Internet resources, and social networks. In this context, the role activities of journalists take other parameters, greatly expanding professional requirements, the transition from narrow media specialization (newspaperman, television, radio journalists, photojournalist, etc.) to universality. Journalists generally do not only record and acquire information, conduct surveys, write media texts. They are selected in your internet information flow of news in social networks, check it, make installation and adapt to the needs of the publisher.

Sociologists, media analysts the results of their research argue that not only the printed versions of traditional newspapers, but traditional radio journalism and mass-air television gradually recedes into the background, returning to position the Internet as a powerful and comprehensive channel of communication. The speed, mobility, versatility, multimedia and interactivity are the absolute advantage of Internet journalism, by which new media win the competition with traditional channels of communication. Convergent edition today is a universal group that thanks to digital technology, having computer programs that can select and edit video, audio and text information. Biaxial journalist - a versatile, multimedia journalist.

Another aspect of convergence in modern journalism is a global transformation of the functional principles of audience media. Passive consumers of information observers are increasingly transformed into active users, blogs and ICQ Number commentators and even the creators of information. The role of the audience is increasingly approaching the role of a professional journalist, the object information is transformed into the subject. The reader, viewer, listener, Internet users were able to immediately respond to the information promptly to discuss it, vote, share your thoughts with other objects of the disclosure process, no matter how far they are from each other, form a social movement based on the received information and more. The audience becomes an accomplice of the production process of multimedia information. Editors of newspapers and television, referring to his audience, calling its transfer over the Internet interesting information, that serve as special correspondents, freelance journalists. Appeared the concept of "unprofessional journalism." And it should be noted that the latter is increasing competition journalism "professional" because direct "live", no processed editor’s impression, often naive, emotional, no standardized, - cause great interest and have a stronger impression than "correct" reporter activities. It is a completely new quality of journalism, demonstrating its resonance with respect to the environment.

Convergent processes in the field of journalism develop in several directions, is multidimensional. Norwegian researchers Anders Faheryord and Tan Storsul defined as at least six aspects of media convergence: 1) convergence networks (converting the analog signal to digital, now no longer matters what data and what kind of message broadcast communication. For example, today's digital cable TV networks can broadcast not only a television picture, but also computer data, providing Internet access and telephony to digital communications), 2) convergence terminals (combining different devices into one multifunctional device designed to receive and use information that Today was the computer that gives access to the Internet, allows you to view TV and flipping pages of newspapers on the screen) 3) convergence of services (assuming that based on digital networks and terminals appear compliant services, quite different nature, but they are one of "electronic" way. For example, Short data messages in mobile telephony, chat, blogs and other services), and 4) convergence markets (telecommunications companies actively position themselves in media, such as opening their own channels, or of the telecommunications market with companies merging media market), 5) convergence of genres and forms (as a result of various media platform - such as print media with television-based Internet portals - genres that were previously characterized in any one media platform, penetrate and assimilate with others), 6) Convergence regulation (as a result of convergence of markets and the emergence of joint market power introduces regulatory procedures common to all. In particular, there is a merger of various ministries into one, the relevant departments, committees, etc.).

Thus, the convergence of media is not only at the level distributors of information (i.e., the

very wording of the media) and is available on the level of channels, consumers and their everyday practices of users of devices intended for human consumption media messages, and finally the most media materials. Convergent processes in journalism show how the onset of a new era of information radically changed not only the landscape of media industry, but also all its settings and components. Media are becoming increasingly powerful sector of modern business and quite different in quality and features.

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Article considers the phenomenon of convergence in modern media as the latest trends, deterministic rapid development and implementation in all spheres of life of digital technologies. In journalism, this phenomenon manifests itself as a multi-multimediasation that fundamentally changes the traditional forms and methods of media, modernizing the classic embodiment of journalism.

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Ellina Tsykhovska, PhD
(National Aviation University, Ukraine)

"LITERNET" AS THE PLANE OF AN INTERCULTURAL COMMUNICATION: BASIC CONCEPTS AND TERMS

The article deals with a term "liternet", it is systematized terms and phenomena that are its foundation as the plane of cross-cultural communication, traced the origins of these phenomena, different interpretations of scholars.

A communicative factor planned in a culture became wheither the most important in the plane of cyberculture, without which full informational society can’t exist nowadays. Try to organize the basic concepts and terms that are "liternetu" and how the communicative interaction occurs in this area. Such phenomenon with the informative and communicative technology are noted under the term "cyberculture." The book "Informative Society. Cyberculture. Multimedia Art" R. Kluschynskogo includes in a cyberculture a hypertext, a navigation, an interaction and social norms, institutions, codes, and in the determinants of a cyberculture - interactivity, globalization and multimediality.

Besides that every work of art is worthy of the interactive status, and interactivity involves recipient’s activity, R. Kluschynskyy offers this term to name the case, which have been arising in the process of interaction and has procedural nature, without being a subject. The presence of multi-users, which are interactive operating within the bounds of the same network, causes the appearance of different phenomena and terms in the process of intercultural communication, aroused at the request of new technology and a realization of all kinds of know-how within cyberspace.

One of these terms is "liternet." Liternet is something that covers both "online literature" and "network literature", or all sorts of a literature and an internet. An online literature - is a literature to present and promote the Internet, for its turn, a network literature are works, which published with traditional methods outside the Internet lose some of their properties (this group should be attributed among other literary blogs or hypertext novels), and, as emphasized those, who interested in the problem, the Internet isn’t an antagonism attitude to a paper. Difference of the concepts “online literature" and "network literature" made Peter Maretsky in the book «Liternet: literatura i internet». In turn, the term «Liternet» was offered during the literary session, held in Krakow in 2002 and which called Liternet.

Due to availability of accommodation almost any material, in the funds of liternet low and high genres adjoin that abundantly present an artistic life in literary "VORTAL". The latter, unlike portals, is the same as a portal, but is specialized in a particular area. Advance of a literature in the Internet network is achieved through Mailing lists, web pages and online stores, but literary forums can be in mainstream, quickly respond to any copyright news and reading impulses, which are unable to provide the print edition (see Literatorium – the forum of literary criticism on www.literatorium.pl).

The urgency and magnitude of a cyberspace contribute to an introduction and a penetration of the traditional genres inside an Internet, as evidenced by the following names in the "Dictionary of new genres and literary phenomena" as "Internet comics", "Internet newspaper network" and so on.

Mostly e-comics - this is the material not duplicated in the network, and exclusive, specially created *for* and *in* network, differs, as in the case of “online literature" and "network literature" to "Internet comics" and "comics in the Internet". Internet comics are intended for a cyberspace, just get rid of their identity and properties on conditions of a transference to the plane of a paper. Thus, the first comics, created in 1995 for the Internet, were «Argon Zark!» and «Kevin and Kell», and today one of the most popular services that promotes Internet comics is the side WebcomicsNation (www.webkomiks.pl). The network also has its preferential varieties: sprite comic - comic, which appeared on the basis of the photo from your computer screen or of two-dimensional computer games,

fan-comic - exploiting popular topics of comics. One kind of comics are known as Comic blog.

Owing to authors of Google the world's largest digital library Google Book Search were created, which currently has about seven million books and their future ambitions date back to the community freely available to all existing American books. Of course rights reserved so that part of the proceeds will go to the expense of the publishers. Admittedly, pioneers idea of a creation of a huge depository e-books doesn't belong to Google; in 1971 Michael Hart brought it to a life, the initiative whom was the Gutenberg project, within which books were collected, which don't come within a copyright law.

In Poland, digital library funds are presented with these pages: Polska Biblioteka Internetowa (www.pbi.edu.pl), Wirtualna Biblioteka Literatury Polskiej (www.univ.gda.pl), Literatura.net.pl (www.literatura.net.pl) i Wielkopolska Biblioteka Cyfrowa (www.wbc.poznan.pl). In Ukraine and Russia among them are Ukrainian Digital Library (www.elib.org.ua), Gumer library (www.gumer.info) etc.

The reading from a computer screen is not always convenient, it gives a way for more common in everyday life the mobile phone, with which in 2007 the Italian writer Robert Bernocco wrote his novel «Compagni di Viaggio», using in his testimony, only the mobile phone. This approach originates from Robert Bernocco's perception of art as a hobby, but in this case, any person is able to write anywhere, that is the same as blog writing, that approach to the creativity ars poetica. The direct role of a mobile technology in a human life, probably, provoked the author of «Słownik nowych gatunków i zjawisk literackich» P. Potrykus-Wozniak devoted several pages of this phenomenon to "literature in Mobile» («literatura w komórce»), which functions "exercising to rights rather an urban legend than a fact". On the other side of a literature is a distribution of a literature with assistance of a mobile phone, in particular, the creator of the first service for reading books via mobile phone (www.cellstories.net) became Daniel Sinker, who predicted the future to the reading books with mobile phones.

The first Polish SMS novel is «[SMS]: Słowa Mają Siłę» by Daniel Senderka, where a communication between characters happened owing to not only SMS, but also with postcards, phone calls or just emails.

Dwa tygodnie przed wysłaniem pierwszego SMS-a zrobiłem Nadii zdjęcie. Bez pytania, bez pozwolenia, bo robienie zdjęć przedstawicielkom płci pięknej to moje chore hobby. Było ciemno, samolubny obiektyw aparatu zagarnął całe padające na nią światło dla siebie, więc nawet nie zdążyłem jej się przyjrzeć. Wykrzyczała: „Nie, nie, nie!", lecz migawka zapadła, a ja byłem już daleko. Dogonił mnie jednak jej piskliwy, rozkazujący głosik: „Negatywy i odbitki dla mnie!!!". Nie takie pogróżki padały pod adresem włodawskiego paparazzi, nie przejąłem się i tymi. Pewnie poczuła się jak księżna Diana. Zdjęcie się udało. Nie wydała mi się na nim wcale piękna, jeszcze nie wtedy. Poznała jednak mój głos, tak charakterystyczny, że odebranie telefonu by mnie zdemaskowało. Musiałem więc pozostać niemy...

2 czerwca

• MIŚ 22:17 Rozpakować prezent - ślicznie. Może na urodziny? Na kiedy przypadają? Mylą się „ludzie", że wredniara z Ciebie. Dla mnie jesteś miłą osóbką i proszę, by tak zostało.

• NADIA 22:34 Któż tak łże, że jestem wredniara?! Po co rozpytujesz innych o mnie? Choć kobiet o wiek się nie pyta, to Ci powiem, że za 3 dni będę pełnoletnia. Dlaczego napisałeś właśnie do mnie?

• MIŚ 23:45 Ci i owi myślą, że Cię znają. Pędzisz ulicami, więc wydajesz im się niedostępna, a przez to cwana i... Czemu do Ciebie?

Może chcę Cię uratować... Więc 5 czerwca będziesz pełnoletnia.

Blogs are an inalienable phenomenon of Internet space, the beginnings of which dated back to 1997, when John Berger have used the definition of "web blog" to describe his own page www.robotwisdom.com. If ever blogs were created by specialists in programming, but later the functioning of platforms for a creating of proper blogs opened up new opportunities, promoting the perception of the blog not only as a communication channel, but and its interpretation as a new

literary genre. Others reject this application because the blog is a form of an expression that is also a platform for other genres, and bloggers appeal to various forms of literature – a prose, a poetry, essays etc.

In Poland the first blog appeared in 2001 with the operation of the service www.blog.pl. However, the most popular nowadays is the kind of a blog – a microblog (twitter), which mostly is the synonymous with Internet diary. It is in blogs in all transparency the implementation of a structure "product and the recipient" are proposed, as in a creation of a blog participated proceeding from interests, readers have the opportunity to comment the information on this page, acting as a critics, not the final one here has the idea of anonymity, which makes available all level of expression and therefore contributes to a more objective perception of the presented subject.

Chats provoked the emergence of a new language – "netspeak", synthetic and simultaneously organic, for example as Esperanto, created from the existing words. Due to its appearance the hackers, which it was served as jargon, netspeak eventually spread to the whole community of network users (see netspeak dictionary on www.netlingo.com). Language of network includes a written and a visual language, a performative writing, an interactive writing discourse, an electronic dialogue.

The development of the Internet is directly related to a hypertext - a type of a cybertext. Beyond the fact that the concept of a hypertext is a familiar in a literary field owing to the literary theorist Gerard Zhenett with his concept of transtekstualnosti, where it means "a later text, which comes into hypertext relationships with its previous text (hypotext)", this term is the domain of informative technologies: firstly Ted Nelson recommended it during the Conference of Association of Computing Machinery, held in Cleveland (USA) in 1965, although there are earlier references to the invention of this term, connected with the name Vannevar Bush (his equipment Memex).

Since the 1960's, on working under literary and technological experiment, called Xanadu, Ted Nelson wanted to form a "universal library" – the processor of a text that would collect and display the difference between the previous and later turn versions of the document. Here is how a scientist describes the basic ideas contained in Xanadu: «guided with idears, character of which is rather literary than technical, we created the system for storage and search of text in which there are interconnections and "windows". Our fundamental unit, the document could have "windows" on any other documents".

So cyberspace incorporates a number of cultural goods, being the product of art synthesis. And the term "liternet", which actually include any relations between a literature and Internet is a successful combination offered by Polish scientists to refer the balancing on the edge of computer technology and literary sciences.

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Veronika Vasylivna Chekalyuk,
candidate of science in social communication, publicist, journalist,
senior teacher (National Aviation University, Ukraine)

THE PECULIARITY OF PROJECT PRODUCING IN UKRAINIAN MASS MEDIA SPHERE

At the time of economic crisis, we can see a struggle among journalists for the place "under the sun". The media market is oversaturated by personnel - demand can`t cover the supply. In this work we shall review those priorities, vocational skills, which will be useful for practitioner journalists in professional self - realization.

This paper is devoted to the problems of getting journalists skills producing in a condition of hard competitions among media companies, press staff. The journalist, editorial staff, press information agency, press service or any other media group can be compared with the goods… According what principle do we choose necessary us thing, buy house, car, vocation voucher… Evidently, a competitive price and high quality of what we are going to buy are preferable. The employer managed by same principles when he is going to take the new staff. Any good as known needs decoration for the next development and promotion. In the process of development professional journalist education new additional disciplines appeared. Among them the course "Basic of the producer skill" takes one of the first places. The studying of it means the formation of father creative thinking, master practical experience of producing project (object), image, advertisement materials for the publication, popularization of the (object), subject (1). Society the journalist works and grows intellectual is in the state of permanent evolution. It demands from the specialist constant reaction on the new circumstances and self development, investment in himself, his knowledge and skills (2). Just having education of high quality and practical experience the specialist gets highest level of professionalism, gets "skill to sell him in a profit way at the work market". Modern media market is much different of what it was at least the late 1980s. For instance, print mass media is not as topical as its alternative – Internet appears. Digital media becomes priority. The epoch of digital media starts. It becomes more and more popular from day to day. Thanks to social nets such the new form of communication comes as modern media. The journalist to be competitive and not to loose the job must adapts, invests his knowledge and skills into his development. Socialization in journalism gets incredible rotation. The term socialization means special process assimilation society changes, tradition, culture (education, spiritual value, idea, rules, stereotype of world perception).

The results of talking with employer will be successful for the employee just when he can present himself in the best way. The ideal one is who can develop himself and the business of his owner. Identification of specialist goes through looking for his society place, the determination of the activity aim and theme. "Am I a nice specialist"? "What is my unique in at the work market?" – answering this question the specialist defines the direction of his work (3)…

"To discover" the professional in himself, to create his own project, to represent it to the owner, colleagues, partners, sponsors is the main purpose of teaching disciplines "The basic of producer activities" (4). Among the tasks of course is to satisfy needs of work market. In our days the demand on digital media dictates renovation of journalist profession, partly students` studying main theoretic basis of producing, studying world experience and its adoption in Ukrainian conditions of activities, getting practical experience necessary for future journalist during the searching and professional analysis the source of information and management. During the lectures and practical meeting with the students the main goal is to teach future journalists adequate react to the demand of modern media market, to cooperate with the representative of media and show business, politic and PR and advertisement, to orientate in new directions and tendency, to be engaged in improvement of himself, to work hard in the condition of tough competition, to establish partnership connection with the institutions helping producing the (project) subject or object.

We suggest you to get to know what “producer” means. First, in our opinion, it is a person in charge of finance, producing and production spread. It is extremely complicated process in which human factor plays important role and the experience of social communication. Producer activity means choosing the staff, coordination and activity action of all participants of creating and promotion project, investigation and foreseeing all possible results. The producer looks for the sponsors, investment means for the project promotion. He also organizes different level creative, administration, lawful and economic events. Many-sided of producer profession is connected with the development of the project involving not just the methods of creation and promotion, but specialized merchandising, participation in different PR action, creation of promotion companies etcetera.

For example, the journalist works in the team, which is engaged in organization of the festival for the talented children “In the search of the pearls”. Begin with the title suggested by the producer of the project (author of this project). “In the search of the pearls” because the general sponsor was the jewelry company and the children were awarded by pearls on golden chains. So the sponsor advertisement was put into the title of the project and it was very attractive for the investor. From this day the people associate the name of this festival with brand supporting this project.

Media (radio, television, movie, books, newspapers and journals, Internet, cassettes, disks et cetera) influences on socialization, suggesting supplemented, often alternative models social roles, social standards and values. Socialization of the people comes in the process of social communication. Communicating, people overpass each other the information, idea, thoughts and mental states. Communication coordinate complicated group activity, which depends in considerable degree of producing goods, objects.

Producing some object, it is very important to interpret the situations in the same way as all the members of the group do, on whom the production is directed. The people react not just only object characteristic of situation and the meaning the situation have on them. For instance, such situation: the gossips spread, that the prize of buckwheat rises. All the customers fill desire to buy the good at the old prize. As a result, the buckwheat disappeared from the stores shelves and then becomes more expensive. It is marketing step, the result of producer activity. Prognosis in the media often become true dictating the demand for ones project (subject, object) or service.

The task of producer is making by the collective efforts the commercial attractive and potential project. For example, men magazine “Сафарі” releases. As soon as magazine is much in men demand, issue of “Сафарі Леді” guarantees, using the additional means. When the magazine for women the admirers of adventures and hunting become popular the magazine “Сафарі для дітей” is issued. It popularizes as a free of charge supplement to the men and women addition. This covered way of additional staff is right from the point of producing holding company, which includes not just press but hunter area, the net of arms stores and specialized sport boutiques. So the addition occupies a great number of readers. It is attractive for those, who give adds, because it can give the all packet of advertising: in press, at the exhibitions, in the net of stores, on websites and BT-actions.

For the effective practical producing it is necessary during the studying to possess the experience of organized activity. Except solving the problems and coordination the producer must awake the staff on doing the work effective on the project.

First of all, producer is manager of specialist team doing the project. That is why the communicative facilities are very important. During studying discipline students journalist are acquainted with the history coming-to-be and formation show-business in Ukraine and abroad. Draw attention to studying experience of producer activity in cinematography, television, media and politics.

In the era digital media space the students are first of all suggested to study the main difference in the work of producer and PR technologist, to get the skills of practical activity in Internet. Among the virtual digital image projects we pay attention to BTL actions, their place in producing (object, project). Using the example of popular press and media companies, we study models of media business, invite expert specialists for master classes with the students.

The skills which the students –producers have got are in the following:

- with the confidence to orient in modern public space of demands, to evaluate the tasks of the project, to make business-planes, to react on changing the priorities, to correct the producing actions, to create strategic plans, using in it professional world experience, to analyze image and business materials,
- to know how to adopt the thoughts (projects) in a producer form,
- to build the position strategy,
- to create self presentation, make business plans,
- to create basic of producer activity in cinema and media sphere, politics, show-business (4 p.5).

Accent is made on important of creation portfolio released projects with the expert response, partners and producer clients. Among the themes, suggested for studying, is the history of installation and development producer activity abroad and in Ukraine, organization of producer work with different editorial staff, analysis of press materials and business-plans of success modern edition. The students are suggested practical edition for the self training, partly: using the way of compare analysis and monitoring materials of press to find the difference, peculiarity of producer work in different genre of culture, create strategic plan of producing individual aspects of projects, own model of project for the father producing.

For example, if we want to develop our own Internet-portal, the significant steps on the beginning stage of producing is arranging the partnership with the aim audience websites. In condition of advertising exchange project will be develop and conquer the biggest audience of portal visitors. It is also important to arrange the partnership with printed and audio vision media, to take part in BTL-actions, to be media partner of actual events (concerts, show, conferences and other wide masses events), to initiative creation of own image projects and competitions, setting on audience of Portal, to suggest the visitors of website active, exclusive, useful, actual information own production, published and based on origin.

Each textbook for the journalists is about intend of specialist, necessary of his objectivity and truth in a spreading information in market press condition. First of all it is commercial project. If we do not talk about high profits, in the same way it may be lobby somebody political interests, which means “untwist” and, as the result, getting the same money. The young specialist must be acquainted with it and be able socializes in modern world, be commercial attractive to the employer, present his opportunities according to the determine purpose.

In May 2012 in Kyiv the conference “Up-to-date approaches to the professional journalism: key changes and fundamental things” was held. The specialists in one voice underline that the audience of printed press gets less then it was early, the advertisers go away in a search of alternative promotions of goods and service. So the newspapers are in the state of evolution. Printed press overpasses in a size Internet on-line, the articles are created in a new genre and size. For example, the text includes video synchronous of respondent and expert, the article is complicated by photo pictures, scripts, intricate moving diagrams, maps and schemes. The newspapers suggest on-line translations of world events within own Internet pages (website or social networks), sometimes even overpass television, found their own groups in social nets. The release of mobile edition, news distribution, publicity messages according to the tastes of audience become more popular. The experts forecast about renovation of journalist profession focus on creations of new genres alternative classical forms of giving information (5).

Now it is a matter of great importance to use all the opportunity for teaching specialists of mass media sphere in the best way. Partly for the improving education it is necessary to study the course “ The foundations of producer activity” (4), because the student receives the knowledge according the choosing direction of his activity, creation of project, its position, own development, what in great deal determined by human factor (the choice of journalist sphere of activity, education, theme, object of information, aim of professional and personal obligations, moral and politic, which must not contradict each other et cetera). Professional mobile, possibility without much time and big financial expenses change the direction of professional activity in the frame of

the journalist profession will give the future journalist the opportunity quickly adapt to the market demand and be competitive in a narrow specialization.

The summery

Press is developing multimedia complex. The audience and media market establish new rules. They appeared from the society requirements. So the function of mass media is not just information or interpretation but the audience development. And the other thing is to attract advertisers and investors. The communication with the potential reader, listener and spectator appears in a new size. Just skilled journalist (press organ) may be competitive at media market. The system of social communication foresee multi vector knowledge and skills the representative of public professions, partly for the journalists in the classical meaning, and for the representatives of press service, speakers , PR and politic technologists, for those who looks for his place in media sphere. The art to conduct negotiations, arrange contacts, make reasons for media partners, present his own person and his project give the possibility to overpass competition and find own sphere of activity on the media market in preparing qualified information in on-line regime. The human professionalism measures not by the kind of diploma or the number of certificates about the participation in different trainings but practical knowledge and released projects.

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M.D. Danchuk, Cand.Sc. (Psychology)
(National Aviation University, Ukraine)

SOCIAL NETWORKS AS MEANS OF COMBATING CORRUPT PRACTICES

Corruption in Ukraine has emerged as a national disaster, it is one of the key inhibition causes of any development. The new stage of social development, for which the expression through social networks is characteristic, could be crucial in the fight against corrupt practices provided proper communication with the authorities.

Corruption became one of the biggest perils for national security of Ukraine and got extended to national disaster, shattered citizen's faith in their own state, significantly restricted its development, claimed on 18th of April 2012 Andrii Kliujev, the Secretary of National Security and Defense Council of Ukraine. He stressed that after breaking administrative discipline corruption became one of the key inhibition reasons of any reforms, mentioned that corrupt actions kill competition, lower pace of economy modernization.

A. Kliujev as executive secretary of National Anti-Corruption Committee assured that it's fully in our power to turn the tide provided political will. He gave an example of Singapore, which during few decades reached huge success in combating corruption [1].

Nine years ago the second President of Ukraine Leonid Kuchma also claimed that corruption is one of the most dangerous problems of modern age, for Ukraine it became a factor that is a real peril for national security and constitutional order in our state [2]. According to data of Transparency International by then Ukraine was on the 106th place of 133 in the list of the most corrupt countries. In 2002 Ukraine together with Georgia was on the 85th place, altogether there were 102 countries on the TI list [3, 4].

In 2011 according to corruption perceptions index Transparency International Ukraine took the record low 152nd place. In a year Ukraine came 18 positions down and landed between Tadjikistan and Uganda. In summarized Transparency International ranking on one rate with Ukraine there are such countries as Azerbaijan, Honduras, Nigeria, Togo, Philippines, Bangladesh, Sierra Leone and Zimbabwe. There are 183 countries altogether on the TI list. Georgia became a state where the corruption perception level got higher than in some European Union countries, among them Slovakia, Italy, Greece, Romania and Bulgaria, it keeps the 64th place [5].

Historico-legal studies give evidence that corruption and state come to life at the same time. Charles Montesquieu wrote: "…constant experience shows us that every man invested with power is apt to abuse it and to carry his authority as far as it will go" [6].

Indeed, corruption existed, exist and will exist. We are not able to liquidate it fully even by means of the most violent punishments, even fear of death penalty doesn't stop the bureaucrat tempted by lucre. From 2000 till 2009 there were about 10 thousand civil servants shot down in China, 120 thousand of them were incarcerated for the terms from 10 till 20 years. The capital punishments of corrupt Chinese civil servants were shown on TV [7].

It is possible to successfully restrain the corruption, the experience of Singapore and Georgia is a good example for Ukraine. The Secretary of National Security and Defense Council of Ukraine A.Kliujev is right when he says that the political will of state's government, executive government authorities, security agencies, authorized for combating corruption; political will of parliamentarians by formation and passage of efficient anticorruption laws; the will of the public is necessary for this to manage.

It's to be noticed that the government without social support is objectively not able to calm down destructive corrupt processes. Far-reaching campaign against corrupt practices will become efficient when the society starts informational and the government organizational and legal attack on corruption, when none of revealed and made public facts will be left unnoticed and without proper reaction.

Melnyk M.I., one of native corruption researchers points, that besides providing citizens

awareness about activity of government agencies and their administrative officials mass media exercise a function of prevention and combating corruption. The scientist gives a reason for it that by nature mass media is a social institution that throws light upon processes, which take place in the state including throwing light upon "black spots" of corrupt practices, essentially influences social psychology, formation of a relevant public opinion and finally making socially significant decisions by certain authorities and functionaries concerning corrupt officials.

From his point of view presentation of corrupt practices in mass media has generally preventative meaning, as well as directly influences the usage of anti-corruption regulations concerning specific functionaries. Melnyk M.I. fairly claims that hiding of corrupt practices creates a favourable climate for abuse of authority and their presentation decreases the possibilities for spreading of corrupt relationships in the society. By informing about corruption facts, revealing functionaries' illegal activity mass media create an atmosphere of intolerance towards corrupt officials, create preconditions for law enforcement authorities for their relevant legal reaction on corruption facts.

The scientist gives example from world practice - in many cases the functionaries including those of the highest ranks of state officials were revealed in corruption and were brought to legal or political responsibility only thanks to public disclosure of information about their illegal activities and thanks to journalistic investigations, which formed the basis for investigations of authorized government bodies. After journalists established and presented facts of authority abuse by state officials it became a beginning of the end of their political career, for instance B. Bhutto, B. Netanyahu [8, p. 87-89].

Melnyk M.I. points out that only independent and impartial mass media can perform their duty in anti-corruption activity in a proper way. This is a fundamental truth, which doesn't need to be proved [8, p. 93].

In one of his works a German scientist M. Haller mentioned that mass media as main openness carrier should not be megaphone of certain groups, but serve common interests so they should function as universal intermediary as well as help the parties to vocalize their views: their task is to support the communication between population groups as well as between publicity and state authorities [10, p. 293].

At the same time Haller emphasized that independency of a journalist cannot be absolute: as an employee a journalist of a newspaper at least psychologically is under such relation to his editor in chief/publisher, which is perceived as addiction, he feels himself tied by publicistic principals of his publisher's house, most broadly defined tied by constitutional order of the state and society [10, p. 292].

The matter of journalistic independency is pretty important of course, society needs honest and principled correspondents as they are specific signaling sensors, which alert the society through mass media about dangerous challenges including corrupt ones. It is them, from whom the society got to know about high-profile corruption scandals lately, and the government used the materials from journalistic investigations in order to get rid of bribetakers, embezzlers of State property etc. And thanks to some of them the society has just reconsidered itself and drew certain conclusions and steps as for its further development. The first on this list is Georgiy Gongadze and will stay so forever. For Ukrainian journalists he became an example of self-sacrificing fight against corruption. His word journalist-fighter dispersed through Internet, independent from chief editors and mass media owners.

Ukrainian society knows Georgiy Gongadze well as a journalist, who became a victim of fight against corrupt authorities, but in our opinion he isn't presented well enough as author of Ukrainian model of corruption revelation. In fact Gongadze as chief editor of website, founded by him and journalist Olena Prytula, for the first time showed effect and efficiency of anticorruption weapon by means of Internet.

It is to be mentioned that since 2000 Ukrainian Internet segment has grown significantly, hundreds of new sites appeared and what's the most important – social networks' development has occurred in abundance, open through blogs to express personal opinion, views, thoughts, impressions, requests, appeals etc.

In her study I.M.Artamonova emphasized that blogs are a new occurrence, which

characterizes a certain development period of the society, connected with the need of self-expression [10].

According to "Yandex Ukraine" research it's been found out that in autumn 2011 there were 1,1 m blogs in Ukrainian Internet segment. Quantity of active blogs (minimum 5 posts and at least one updating within the last three months) made up approximately 100 000. It was also established that Ukrainian users keep about 23 thousand communities.

The most active in the blogosphere are citizens of Kiev, Odessa and Kharkiv. In 2010 after kievans the most active were citizens of Donetsk and AR Crimea. The research results also show that in Uanet there are around 80 thousand Ukrainian-language blogs.

According to the same research in 2011 there were 160 thousand accounts in Twitter in Ukraine, which is twice as much as in 2010 [11].

The new stage of society development, which is characterized by the need of self-expression through social networks, in our opinion has to become critical in corruption combating, provided proper attitude of the government. Each corruption, blackmailing offenses, abuse of official position evidence can be easily made public from now on, which gives the agencies authorized for corruption combating the possibility to quickly perform their social anticorruption duties, and the functionary, who is attempting corruption – to forewarn against violation of the law through fear of inevitable revelation.

Referring to social networks as means of corrupt practices combating it is to mention that they have a line of important specific features, in particular:

- openness;
- efficiency;
- immensity;
- publicity;
- activity;
- efficacy;
- solidarity;
- revolutionism.

This list could be made much longer, but all of these progressive features will work efficient only when social networks will be intelligent implemented into state system of combating corruption. This is actually the main complication, which needs first of all a profound theoretical study.

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G.Yun, Doctor of Science (Engineering), H. Kandyba, postgraduate student
(National Aviation University, Ukraine)

ROLE OF AIR TRANSPORT IN THE DEVELOPMENT OF THE AGRICULTURAL SECTOR

The main problem of Ukrainian grain market, the reasons for poor quality grain and relatively low competition, the proposed concept of using unmanned aircraft for a partial solution to this problem are under concern.

Ukraine has all the necessary conditions for growing high yields of crops, gross harvests of grain may reach 60 million tons, and of this number, wheat should be 25-30 million tons. This is due to the quality of soils, favorable, in general, weather conditions, which can grow more fertile than ravine winter wheat. However, Ukraine is using the potential of opportunities to profit from growing wheat for no more than 25-40%.

It should be noted that Ukrainian grain is not of very high quality.Thus, the quality of grain harvested in the southern regions of Ukraine meets feed quality. At the same time, grain quality in the central region as a whole sets quite high quality, for example, in the Poltava region share of food wheat reaches 70%. However, it is believed that the share of food wheat is 25 - 30% in the whole country.

One of the most important articles of Ukrainian export is wheat (Fig. 1).

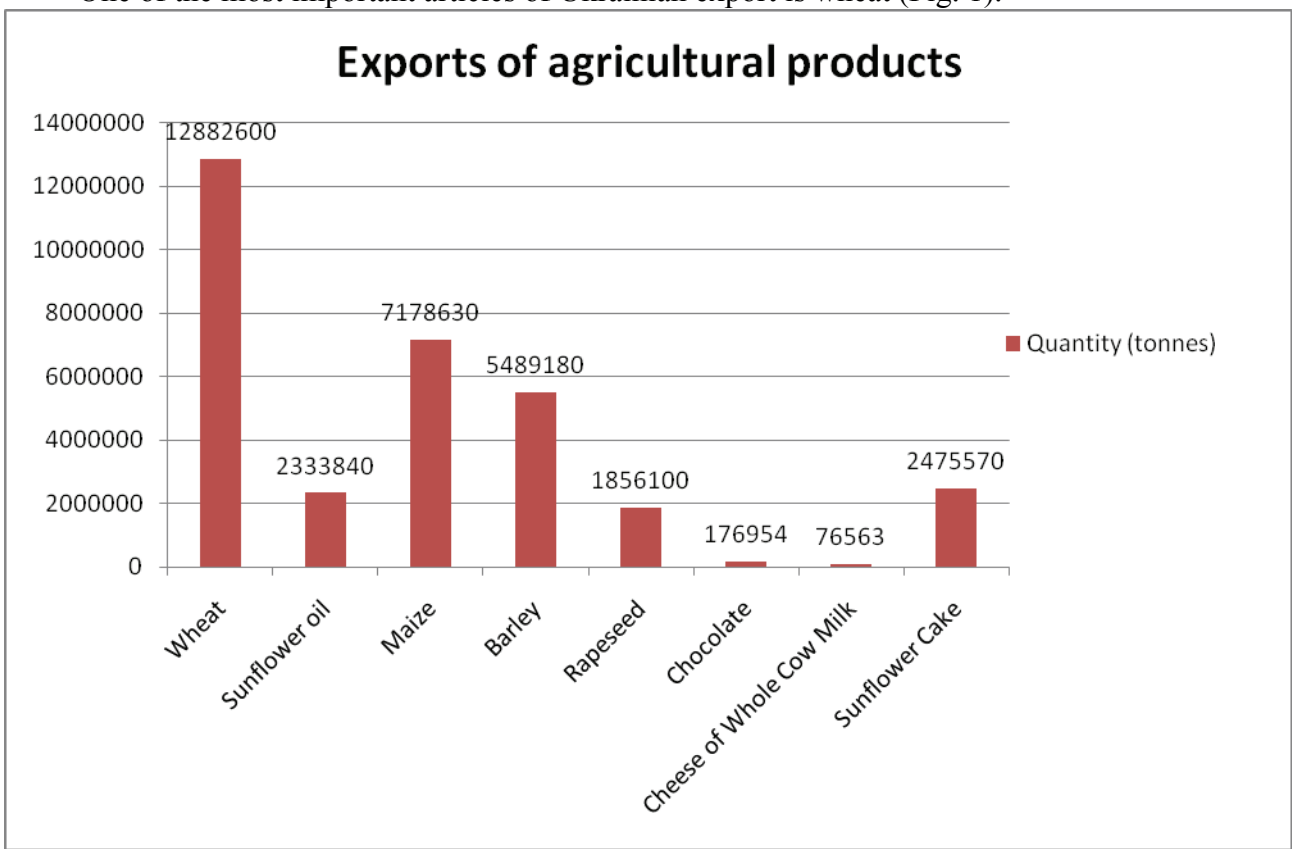

Figure 1. Exports of agricultural products

Based on thechart, we can concludethat the export ofgrainin Ukraineis oneof the prioritiesof foreign economicvectors.However, the aforementioned demonstrates that theUkrainian grainin the bulkiscornmeal, which significantly reduces the costand competitivenessin the globalgrain market.Ukraine is among the ten leading world powers that export of grain.But the stumbling block is getting relatively low profit from exports. For example, if we analyze the statistics of FAO, it

appears that Germany exports less grain, but it gets more profit (Fig. 2). And as it was already mentioned, it is primarily associated with forage quality of grain, i.e. Ukrainian grain simply cannot compete with foreign counterparts.Thus, for example, a ton of grain produced in Germany is worth 227USD, and a ton of Ukrainian-growngrain costs 138USD (Fig. 3).Of course, the final cost included the cost of technology, labor charges, etc.The final price of the product, which is formed on the quality of grain, is important to us.

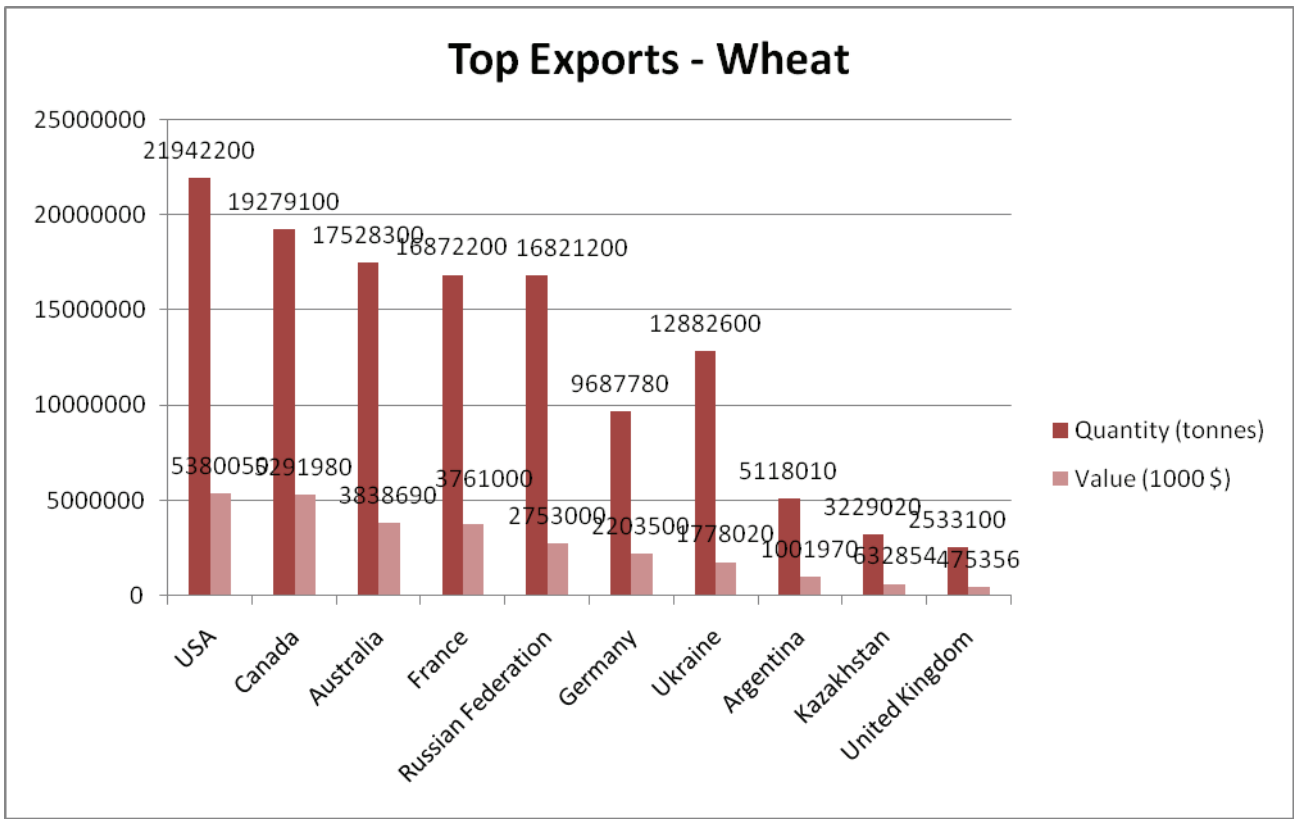

Figure2. Top Exports – Wheat

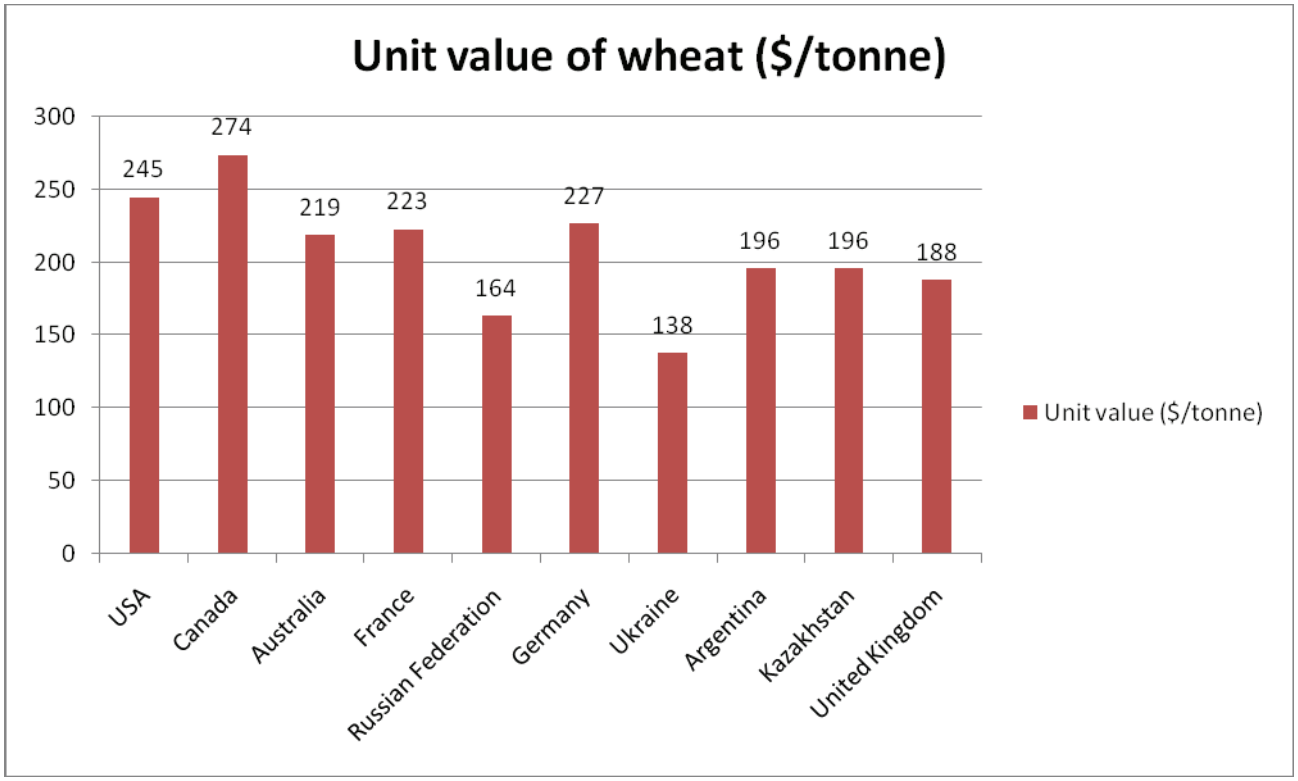

Figure 3. Unit value of wheat

Thus, the 2010 wheat prices in Ukraine rose by about 50%, the price of corn - 30% and the price of sunflower - by 33%. Meanwhile, Ukraine is losing about 20ts grain from 1 ha is associated with both outdated equipment and with relatively efficient methods of crop / agricultural lands processing and the weather.

The cost of growing wheat on 1 hectare is quite high and reaches about 5000 USD. It should be emphasized that the costs would be significantly higher in conventional tillage technology, exceeding null, as the number of operations from the ground, and the number of vehicles utilized would increase by several times. So, based on data from previous studies of the Canada-Ukrainian grain project, estimated cost of fuels and lubricants is: tillage on 100 UAH/ha, cultivation - 30 UAH/ha, packing crops - 15 UAH/ha. According to traditional technology, it is necessary to conduct at least one operation of plowing, two operations of cultivating and one operation of packing. Therefore, the amount of cost increases to 175 UAH/ha.

Yield of wheat averaged 8.5 t / ha.Calculations show that the proceeds of one hectare area will be 9775 UAH/Ha with net profit of 4775 UAH/Ha. The table below shows indicative costs of growing 1 ha of winter wheat.

Table 1

Costs of growing 1 ha of winter wheat

Costs	UAH/ha	%
Seed	500	10
Fertilizers	1350 - 1500	26 - 30
Pestitcides, growthandprocessing	1000	20
Labor	500	10
Depreciation, taxes, fuel	1500	30
Total cost	4800 - 5000	100

Large reserves of increasing agricultural production lie in increasing the yield and reducing its losses from pests and crops diseases. It was proved that only pest kills 1/3 of the crop annually. To increase the yield and save it from pests and diseases, the most important condition is the use of advanced technologies of growing crops.The use of chemical and biological agents is highly significant. Currently, along with ground machines aviation equipment is largely used for agricultural and technical methods of land processing, the so-called intensive technologies (concerning the use of chemical and biological agents).

High yield largely depends on the organization of agrochemical service. Agriculture of Ukraine is a great agrochemical potential. Efficient use of this potential, a reasonable distribution of fertilizers among regions, rational structure and timely introduction of soil are acting factors of agricultural development. On the contrary, untimely and irrational use of fertilizers and plant protection products significantly worsen the quality of agricultural products.The use of aircraft in agriculture demonstrates a particular interest for further development.At the time when agriculture is experiencing an acute shortage of labor and energy, aircraft and helicopters used as farm machinery, therefore, modern achievements of science and practice will be successfully implemented in agriculture. An innovative technology, corresponding to modern requirements of farming, airplanes and helicopters are vital and urgent problem.

The main reasons for demotion agricultural aviation are economic issues, problems associated with high cost of treatment, lack of fuel, oils and products at agricultural enterprises. Events of the last decade in Ukraine reflected the general condition agricultural aviation.The level of its development was dependent on the solvency of customers. Insolvency farms has led to a sharp reduction of agricultural aviation Ukraine, its degradation and, finally, to the loss of suitable aircraft, helicopters, engineering staff. Reforms of the agricultural sector will lead to small changes in the structure of sown areas in Ukraine.

The urgency of the issue is that nowadays you spray crops, allowing further harvesting of about 6.2 kg of wheat from 1 ha of sown areas.Moreover, it also significantly affects the quality indicators, and thus can reduce yield of feed grain, and increase collection of food grains.

Moreover, Ukraine has about 15000000 ha acreage, so it is easy to calculate, which may raise crops, where a one spraying (at least 30 million kg). If we analyze the data of State Statistics Committee of Ukraine from 1990 to 2010, the representatives of the next picture: reduction of the yield of 1 ha sown when in 1990 was collected 35.1 kg on average, now an average of about 26-27 quintals a hectare is collected, that is, on average harvest fell by 8 - 9 h with 1 ha of crops. It should be noted that in Ukraine in 1990, about 9.515 million hectares of grain was treated from air and these works involved nearly 400 aircraft.For example, in 2001, only 0.180 million hectares was handled and in about 40 planes with incomplete image were involved.

Thus, the main problem of Ukrainian grainis low qualityand lowexport priceon the world market. Definitely, the problem is of complexand systematic nature, so solution of the problemof low qualitygrainrequires an integratedapproach. We offerto use the latesttechnologyin the use ofunmanned aircraftfor agriculture.Naturally, this does not solveall the problems, but would partiallyimprovethe quality ofthe crop, and therefore the price competitiveness ofUkrainian grain.

Conclusions

So, despite the impressive agricultural potential.Ukraine does not fully take advantage of it. We examined problems of the grain market of Ukraine and can state that although Ukraine is among the top ten exporters of world leaders, the grain quality of national origin is inferior to competitors, and therefore has a lower cost than the American, German, Canadian, etc., which naturally affects the income of farmers and the state. The problem is of systematic and protracted nature, and requires a systematic approach in many industrieswhich, one way or another, interact with agriculture.

In the context of our study, we propose to use the latest aircraft to respond to the challenge, namely, to utilize unmanned aircraft. Practice shows thatone treatment of grain crops by aircraft, can increase yield by at least nine quintals a GA. Undoubtedly, introduction of such technology has a positive impact not only on the amount of grain, but also on its quality.

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G.V. Zhavoronkova, T.N. Shkoda, V.O. Zhavoronkov
(National Aviation University, Ukraine)
I.P. Sadlovska,
(Ministry of Infrastructure of Ukraine)

AVIATION PERSONNEL IN HUMAN CAPITAL MANAGEMENT SYSTEM OF AVIATION TRANSPORT ENTERPRISE

The aviation personnel importance in the human capital management system of the aviation transport enterprise is shown, the human factor influence on the functioning of the whole system of air transport is analyzed, the need to strengthen the requirements to pilots selection by Ukrainian aviation companies is identified in the article.

The global financial crisis intensified the search of ways to improve the industrial and economic activity efficiency by air transport industry companies. One of these ways can be the human capital management efficiency improvement.

The aviation transport enterprise human capital management system, as any other, consists of such subsystems as formation, development, realization and reproduction of human capital.

Tadeusz Listwan [9], the Polish economist, describes an enterprise level of human capital. He definites human capital as combination of intellectual, personal, health and motivation features as well as competences which help workers to develop them and the organization to develop and function. Thus, we conclude that personnel is also a carrier of the aviation transport enterprise human potential, which is turned on the human capital in the process of its realization and makes profit for the enterprise. The aviation transport enterprise personnel is usually divided into: aviation personnel (pilots, flight attendants, engineering personnel), executive and administrative personnel.

In Ukraine, the aviation personnel professional activities are regulated by Air Code of Ukraine [1]. According to Art. 40 Air Code, a person who belongs to the aviation personnel must meet the qualification requirements for occupational, health and have a properly executed certificate in accordance with aviation regulations of Ukraine. Listings of the aviation personnel positions are approved by the Government of Ukraine.

The certificate is required for such specialties of the aviation personnel:

1) pilot of the aircraft;
2) air traffic control dispatcher (air traffic controller);
3) aircraft maintenance personnel;
4) test crew members;
5) passenger cabin crew member (flight attendant);
6) flight support dispatcher.

Under the rules of issuing the aviation personnel certificates in Ukraine, approved by the Ministry of Transport of Ukraine as of 07.12.98 № 486 and registered with the Ministry of Justice of Ukraine on 29.12.98 № 833/3273, aviation personnel is a subject of mandatory certification [8]. Individuals from the aviation personnel of civil aviation are allowed to work with a certificate (certificate). The rules set requirements to candidates for receiving certificates and qualifying marks, the order of the aviation personnel certification, the issuance of entry restrictions and withdrawal of certificates, extension of their validity etc.

State control over the aviation personnel activities is specifically authorized in the sphere of civil aviation [2]. Appropriate level specialists training is provided in educational institutions according to the list of the aviation personnel positions in civil aviation. These educational institutions must have certificates and licenses specifically authorized in the field of civil aviation.

It should be noted that the availability of requirements for the aviation personnel training is an important component of the human capital formation subsystem of the aviation transport enterprise.

The flight and control personnel's training takes a special place. The flight activity of pilots is

usually considered within the system "crew - aircraft" (EPS), a subsystem of the air transport system (ATS) [4]. The ATS functioning quality is determined by many factors that have deterministic, probabilistic and uncertain elements.

The aviation personnel training is a component of the human capital development subsystem of the aviation transport enterprise. There are the following types of the aviation personnel training: initial training; work place training; ground training; flight training; retraining to switch to the other aircraft types; recurrent training; training in the problematic areas; training in practice of working out the sequence of actions in emergency situations.

One of the major impacts on the functioning of ATS is the human factor. Analysis of flights safety and civil aircraft accidents potential factors identification in Ukraine in 2010 showed that the human factor influence was in the following [3]:

- improper removal of ice from aircraft surfaces by technical staff, leading to falling ice in aircraft engines;
- delayed implementation of pended technical maintenance by MEL;
- poor maintenance of aerodrome surfaces, which resulted in damage to the airframe and the aircraft engines by foreign objects;
- consumption of alcohol by crew members before the flight;
- wrong decisions by commanders of aircraft to take off and land in the weather conditions below the aerodrome minimum;
- deviation of crew from the standard procedures during landing on the parallel air-strips, which led to landing on the runways unauthorized by the dispatcher;
- violation of limits by the crew set by AFM during the aircraft exploitation;
- deviation of pilots-instructors from tasks to perform educational flights, which led to serious events (accident, serious incident);
- failure to give air traffic information by the air traffic control dispatcher to the aircraft crews which are potentially in the conflict situation;
- violation of work technology by engineering staff during the maintenance types provision, repairs.

The presence of such human factor negative effects indicates ineffective human capital management in the aviation transport enterprises of Ukraine. Thus, the aviation transport enterprises should improve the system of human capital management, for example, by strengthening the requirements for the aviation personnel selection and by investing their capital in the process of pilots training. Thus, the requirements for airline pilots are given in table 1.

As you can see, the requirements to pilots of such international airlines as British Airways and Lufthansa AG compared with Ukraine International Airlines (UIA) are more stringent on the practical component of pilots' qualification - namely, flying hours and work experience.

Also, it should be noted that Ukrainian aviation companies pilots retraining for working on foreign-made aircrafts is provided in European training centers. And Ukrainian aviation companies have to spend additional money in foreign currency for such retraining abroad. So, practical activity's results confirm the higher efficiency of the international aviation companies' human capital management systems versus Ukrainian ones.

Therefore, today the state should regulate the realization mechanism and process of flying practice control, and a system of contractual relationships between high schools and domestic airlines for investing extra-budgetary funds in training pilots and engineering staff should be developed and implemented [5].

Summaries

Summarizing, we note that the air transport system functioning is largely determined by the influence of human factor. Thus the main task of the aviation transport enterprise human capital management system is to minimize the negative impact of human factor and improve organizational performance. Necessary measures should be developed for this purpose. Such measures for Ukrainian aviation companies should be stringiness of recruiting requirements to the aviation personnel and increase of investments in the process of pilots training.

The further researches of this theme should be connected with identification of necessary methods of the aviation transport human capital appraisal.

Table 1

Aviation companies requirements to pilots

Qualification level	Aviation company		
	BRITISH AIRWAYS	**LUFTHANSA AG**	**UIA**
Availability of license	Licenses issued in the UK by JAA / CAA ATPL	Valid by JAA, FAA, or ICAO ATPL or frozen ATPL	Higher education by specialty, availability of CPL or ATPL
Flight hours	Total flight time - 2000 hours, minimal time among them is 1000 hours from the last experience or on a jet with R 25 t or turboprop aircraft with R > 50 t	Minimum 2000 hours from the last experience, minimal time among them is 500 hours on A300-600 or A310	Not less than 500 hours
Work experience	Flight experience on simulator not later than half a year	Last flight not later than 3-5 months	---
Additional requirements	Fluent English (ICAO minimal level IV) with positive summary for license	Valid medical summary of class 1, age up to 50 years, fluent English (ICAO minimal level IV) with positive summary for license	Up to 45 years, high level of English, valid medical certificate and foreign passport

[Developed on the basis of [6; 7]]

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V. Kulik, Ph.D., professor.;
O.Poznyak, Ph.D., senior lecturer;
J. Remyga, assistant
(National Aviation University, Ukraine)

FORMATION AND DEVELOPMENT OF AIR TRANSPORT-LOGISTICS CLUSTERS

The state of Ukrainian logistics sector has been considered in the article. The main methods of creating core of transport-logistics cluster have been approached. The content of basic logistics operators in cluster core has been determined. Keywords: cluster, transport-logistics cluster, the national economy providers.

Problem. A necessary condition for withdrawal of Ukraine from the global financial and economic crisis is to solve the problems of national economy competitiveness. Experience of leading countries shows that it's can be achieved only through a transition to innovation development model. As one of the variants of this model can be seen clusters focused on territorial, functional or production group of interconnected companies and associated with their activities of scientific, educational, guarantee organizations that are characterized by common interests and complement each other in their specialization. Porter, founder of the clusters theory, believed that the enterprise of individual industries tend to concentrate in certain regions. The most competitive companies actively influence on the market players with whom they interact - suppliers, customers and competitors, increasing their competitiveness. In turn, the competitiveness of these enterprises will favorably affect the operations of the enterprise-leader. As a result of such active interaction appears synergistic effect [1].

Problems of development and clustering of transport-logistics systems was devoted by D.M.Lambert, M.Dzhyllynhema, V.Sergeyev, D. Novikov, S. Gritsenko and others. It is recognized that one of the most promising and dynamic areas of modern economic clustering is logistics, which is considered an effective source of development and competitive advantage.

Most important factor of Ukrainian economic development is the integration processes in the transport-logistics activities, given the transit potential and place our country in global trade flows and global macrologistics system as a whole. Global logistics market 10 years ago was estimated more than 5 trillion dollars and is growing by 4-5%.

However, in the World Bank Rating in terms of logistics efficiency (Logistics Performance Index - LPI) in 2007, Ukraine was ranked only 73th among 150 countries. Logistics indicators estimated had seven parameters: 1) the activity of the customs service - our country has won the 97th place, 2) the infrastructure - the 74th place, 3) the international transportation - 83th place, 4) the logistics competence - 90th place, 5) tracking and tracing (recording and track gauge) - 80th place, 6) the internal costs of logistics – 21th place, 7) the timeliness of delivery - 55thplace. Among the leaders which joined the top ten were: Singapore, Netherlands, Germany, Sweden, Austria, Japan, Switzerland, Hong Kong (China), United Kingdom and Canada. Belorussia and Russia took the 74th and 99th places respectively. Formation of transport-logistics cluster can be an effective tool for enhancing the competitiveness of Ukrainian economy by minimizing costs in logistics and increased export business activities.

Analysis of recent research and publications showed that in the field of logistics in Central and Eastern Europe there are about 25 major and 60 minor transport-logistics cluster. For example, established in 2003, transport-logistics cluster in Slovenia has a membership of 13 companies and 3 agencies involved in freight forwarding and delivery, providing port services, developing educational programs and resolve issues related to air pollution, form a complex transportation and logistics services. The process of active transport-logistics clusters development in different levels and scales is now in Ukraine. Thus, in the Kherson region the first in Ukraine transport-logistics cluster has been considered, which integrates different 106 enterprises and organizations, including 3 sea ports, 7 river ports, 5 shipping companies, ship-repair yard, rail and road transport, airports,

airlines. Promising development projects is the Donetsk regional cluster, innovation and technology cluster "Sorochinskiy Fair", green tourism clusters, fuel, financial and other types of clusters.

Although initiated in Ukraine the formation of logistics clusters, regulatory framework to create clusters is under construction. One of the first such legal instruments became a state program of industrial development in 2003 - 2011 years, approved by the Ukraine Cabinet of Ministers № 1174 by 2003 July 28th. To implement this concept was developed the Conception of creating clusters in Ukraine. According to this Concept are the following types of clusters: manufacturing, innovation and technology, tourism and transport-logistics. To create a cluster proposed to carry out activities for the awareness campaign among potential participants and stakeholders to explain the competitive advantages of clusters in transition and market economy. At the same time, international experience shows that the first stage of clustering these processes is engaged directly by the state. Ukraine Ministry of Regional Development, Construction and Housing and Communal Services in 2009 drafted a National Strategy Concept formation and development of cross-border clusters, which provided for the period to 2015.

Part of general problems. Despite the current practical experience of clusters creation and the presence of certain legal documents, working with many areas of the cluster policy hasn't yet started, including:

1) not established base of scientific and methodological, information-consulting, educational support cluster development at the regional and sector levels;

2) there is no coordination of national and regional authorities, business associations by the implementation of cluster policy;

3) insufficiently developed mechanisms of functional and product clusters, forming the specialized clusters nucleus on the basis of existing businesses, basic service providers, transportation, manufacturing, distribution nodes.

Solutions to these problems will restore the effective functioning of many bankrupt companies, including peripheral airports, which can become the core of transportation, logistics, tourism and other activities in business cluster and local community.

Formulation of article's objectives. As one of the important areas of Ukrainian cluster policy is to provide scientific and methodological support development cluster, it's necessary relevant research in theoretical foundations and methodological framework to improve the creation and development of different type and purposes transport-logistics clusters. Refining requires concepts and terminology, particularly the content of the essential characteristics of "transport-logistics cluster." The object of research has chosen formation of air transport-logistics cluster and its core - zoning airport as aviation freight and passenger traffic logistics center in the interests territorial local businesses and local community.

Contribution of basic material. In our view, under the transport-logistics cluster should be understood geographically defined group of interconnected companies, organizations and companies that specialize in providing transportation and logistics services, and related to their scientific and educational activities and ensuring that organizations that actively interact with consumers logistics service and provide transport-logistics infrastructure.

Using the cluster approach in the formation macrologistics systems allows fully implement the basic provisions of systems theory and the theory of compromise, which, in fact, based logistics concept. It is within the cluster is carried out active exchange of information between interconnected business entities, is carried out coordination of economic activity conditions. The effectiveness of cluster mechanism is to reduce the uncertainty element and a high degree of prediction market situation for the cluster participants. Formation of transport-logistics cluster, in fact, is a new stage of development in transport-logistics systems on the basis of a voluntary association independent economic enterprises and organizations of logistics.

Initiative on formation and development of transport-logistics clusters may originate from both the executive and local authorities as well as from businesses and territorial public. Transport-logistics cluster is created and operates on the basis of the following general principles:

- democracy (the integration is carried out taking into account interests of a cluster on a

voluntary basis);

- the geographical zone of attraction to the cluster nucleus (the cluster members within a particular city, district, region);
- cooperation in logistics as well as leading business enterprises around the cluster (interaction between participants within the cluster contributes to a synergistic effect);
- equal rights and responsibilities (cluster members combine and operate on the basis of equality and responsibility for their activities, and for the creation and functioning of the cluster core);
- presence of the leading enterprises in the cluster, which will coordinate the actions of all cluster members being the core of it;
- efficiency (assessment of the cluster members effectiveness will determine how control them corresponds to the achievement of strategic objectives);
- resourcing (exchange of information, material, legal resources);
- innovation (development through innovation contributes to the strategic objectives of the cluster);
- consistency (a clear logical structure of the cluster, completeness and relationship of all members);
- prospects (a strategy and a staged development of the cluster).

According to these principles a strategy of air transport-logistics cluster that integrates peripheral colony zone around airports airport hub as core aviation businesses in the area of gravitation and some areas of economic business clusters has been offered.

The specific of such cluster is embodied in products, services and needs of the public in air transportation and aviation transport-logistics services for their promotion to the international market segments.

Figure 1 shows the basic conceptual form of transport-logistics cluster based on the characteristics of local business environment and features of manufactured products and infrastructure cluster.

Transport-logistics cluster activity should be based on the developed and approved organizational documents relating to its establishment and operation (creation cluster agreement, join cluster agreement, cluster operation provisions and rules, interdependence of cluster members provisions, cluster members interaction norms and rules, etc.). The main document regulating the activities of the logistics cluster must be creation cluster agreement, which must contain the following items: general provisions, aims and objectives of activities, directions of activities, organizational and legal framework, rights and obligations of cluster participants, etc. Formation of air transport-logistics cluster most appropriate carry out by representatives of leading businesses in a joint stock company, the founders and shareholders which form the authorized capital, strategy, financial and economic subsystem zonal airport - air core cluster with the participation of subsidies and preferences of local government and public support.

The purpose of the air transport-logistics cluster should be: increasing the competitiveness of transport-logistics industry through the development of its innovative potential, increase employment by increasing the number of workplaces, investment attractiveness improvement of exports cluster, the contribution of transport-logistics services in the Gross Territorial Product, tax base expanding and management improvement of transport-logistics activities.

The primary objectives of transport-logistics cluster should be:

1) developing and modernization of infrastructure (roads and railways, river, sea and airports, roadside service facilities - food items, trade, hotels, parking, advertising facilities, warehouses and distribution centers);
2) developing a modern logistics terminals;
3) improvement building, repair and maintenance of roads, their rational use;
4) geographic expansion of the transportation scale;
5) stimulating innovation and new technologies in the logistics industry.

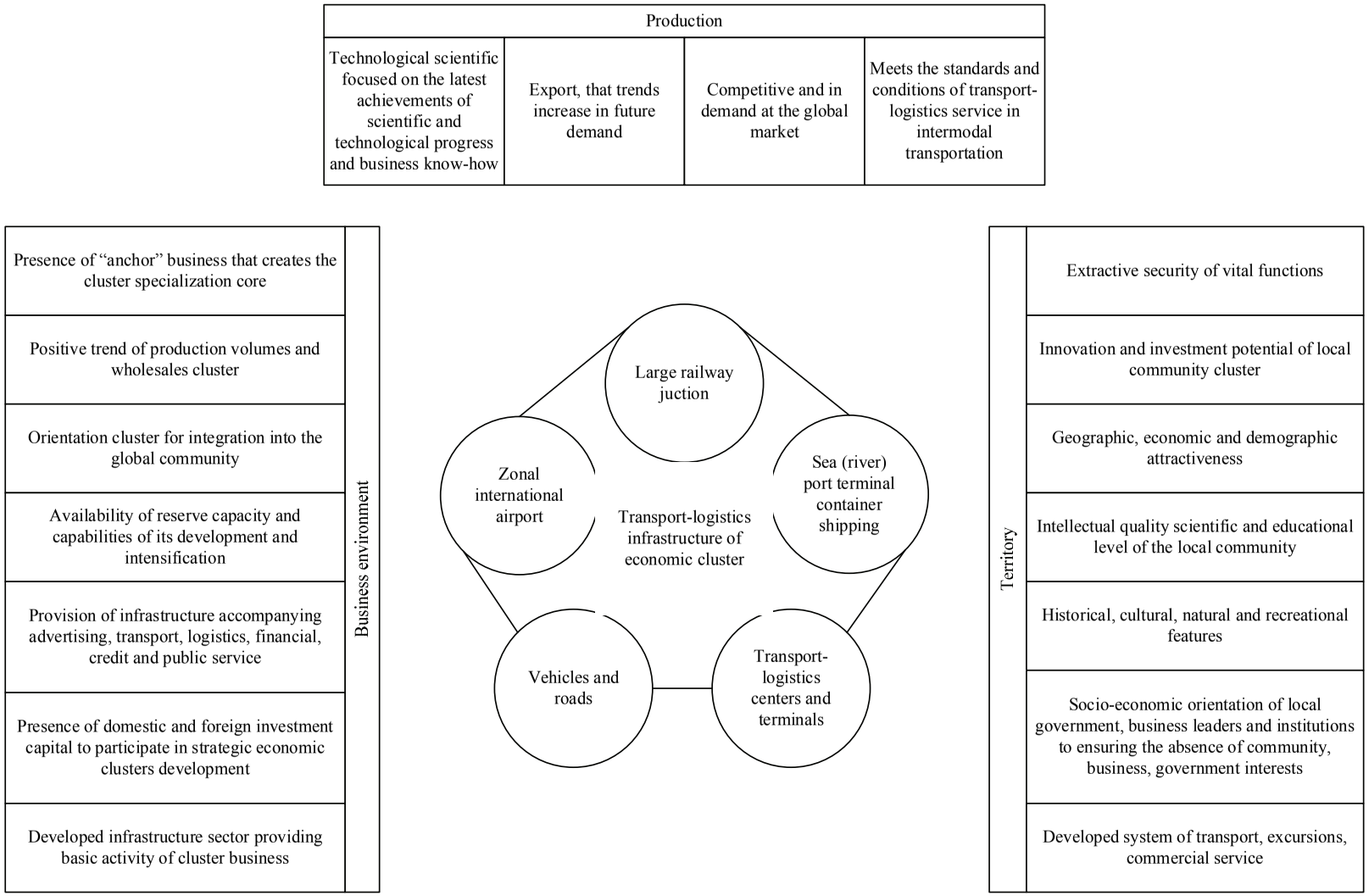

Fig.1. Conceptual scheme of the formation and operation of the transport-logistics cluster core

Depending on the integration degree with business customers, the number of implemented logistics functions and access level to international and regional markets integrators - providers of air transportation and logistics services selected zonal airport - cluster core, which realized strategy of diversification and its transfer status in logistics center as coordinator of transportation and logistics cluster. The structure of transport-logistics cluster also may include credit institutions, banks, accounting firms, government agencies, educational institutions and research centers, professional non-profit organizations in logistics, organizations that provide certification services management system established and efficient multimodal transport-logistics complex.

Effective functioning of clusters is an important step in justifying economic usefulness of the subjects, for building national and international cluster systems. Provide an objective assessment of performance can be on condition by using a complex set of interrelated and agreed criteria:

- economic (economic indicators - labor productivity, capital productivity, materials consumption, efficiency of the totality production costs, integral indicator of cluster economic performance),
- social (rates of growth in employment, salary increases, higher education and training of employees, etc.),
- environmental (performance reduction of harmful emissions, the volume of pure water, preserve the quality of water resources, protection of seas and coastal zones, conservation of ecosystems and biodiversity, reduction of the value indicators of ecological and economic losses, etc.).

Conclusions and prospects for further research. Questions increase of competitiveness in the global market is one of the most important for Ukraine, and clustering - one of the ways in economic development and support it's at the proper level in the system of world economic relations. Whereas the transport-logistics industry plays an important role in social production of our country, the formation of transport-logistics cluster will be great social and economic important mechanism. Facilities consist in the formation modern logistics infrastructure aligned with international standards, in raising productivity (reduce delivery time of goods, lower prices for storage, improving the quality of service, increase passenger and cargo flows) and innovation activity of enterprises that make up the cluster in investment intensification achieving accelerated socio-economic development of regions where the available clusters. These measures ultimately will increase the number of additional workplaces, wages and income to the budgets of all levels, to increase stability and competitiveness of the Ukrainian economy and its branches.

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T.I. Oleshko, D.Sc, professor, O.V. Marusych, Postgraduate
(National Aviation University, Ukraine)

THEORETICAL FUNDAMENTALS OF FUNCTIONAL SUBSYSTEMS ECONOMIC RESOURCE SAVING MECHANISM FOR AIRLINE

At this article defined the essence of economic functioning of the economic mechanism of resource savings, and the reasons for the relationships between its elements, also here is analyzed place and role of each of the blocks. Also there is given a characteristic of functional subsystem of the economic mechanism.

As there search of the scientific sources and practice of management in the transport sector, particularly in aviation sector, shows, the problem of the economic mechanism of resource (EMOR), concerns to the problems which requires additional theoretical and practical research.

In economic literature the notion of "economic mechanism" is used quite widely. But there is no agreement about its definition and its components. That's why there is arises the problem about definition of the most suitable approaches of determining the merits of "economic mechanism" and the study of its main components.

In a different context, this term is interpreted differently, from "...a set of measures" designed to study specific objectives, up to»...set of institutional and organizational structures» and complex of forms and methods that they use [1].

The world's leading scientists saying "economic mechanism" means not just a set of economic tools and instruments, but their system, their interconnected and inter-mix of particular economic regulators[2].

The economic mechanism is the part of the industry mechanism. An author of modern economic dictionary considers this category as "a set of organizational structures, concrete forms and methods of management and law, by which economic laws that operate in specific circumstances are implemented (the process of reproduction)" [3].

Based on the interconnection and interdependence of all economic processes EMOR should be considered in the context of the industry mechanism.

Economic mechanism as a complex management system combines several subsystems which are providing its functioning. There are from two up to six relevant subsystems which are allocated in different scientific literature by different researches. In particular, N.J.Konischeva notes the existence of organizational and economic units (subsystems) [2], and O.M. Nevyelyev and S.A.Moskvin are allocate industry mechanism in the system of organizational management structures, functional relationships and management.

N.G. Chumachenko has formulated six subsystems [1] four of which are the most important - the organizational structure of subsystem, the subsystem management processes, methods and tools of subsystem management and subsystem of the control mechanism.

In our view, this is the most acceptable point of view. Therefore, it is accepted by us as a basis of the economic mechanism of resource. This mechanism should include the following subsystems: subsystem of the organizational structure of management, functional subsystem, the subsystem of the legal provision, implementation of subsystem information. At this article, we will consider the functional subsystem as a central component of the economic mechanism of resource more widely.

Conventionally, the functional structure can be represented as a diagram (Fig. 1), which consists of six blocks. To determine the effect of economic operation mechanism EMOR, cause-effect relationships between its elements, we will analyze the place and role of each of the blocks above.

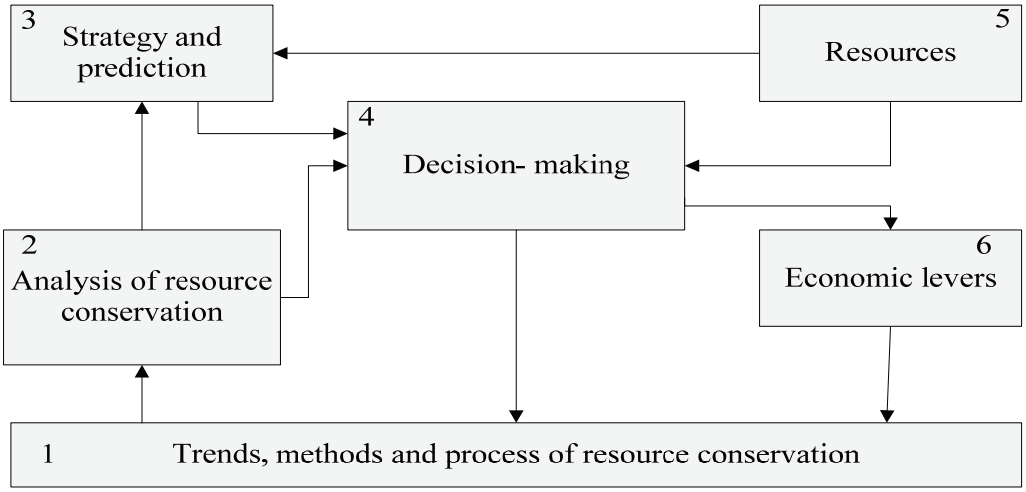

Fig. 1. Scheme ofthe functionalstructure ofthe economic mechanism ofresource

The first block – "Directions, methods and process of the resource conservation". Scheme of the formation of guidelines and methods of resource conservation in the functional structure of EMOR is given in fig.2. Each type of resource is characterized by market of resources according to the usual value. That kind of resources which has the highest consumers value, and the price is the most preferred object of saving, as it provides the most significant reduction in production costs for consumer.

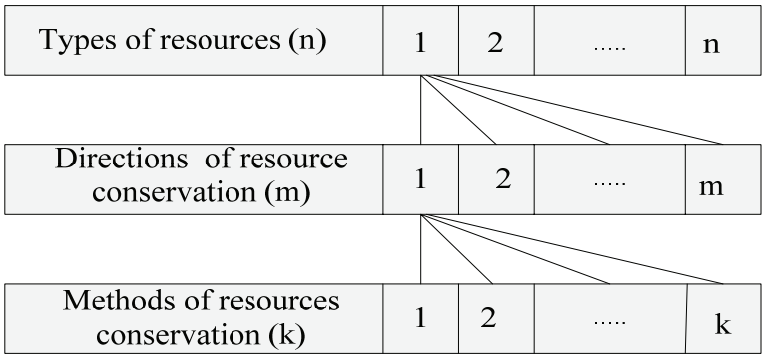

Fig. 2. Scheme ofthe formation ofguidelines and methods ofresource conservation

Therefore, in the process of resource consumption each kind of resources that has a use value should be used cost-effectively as possible (in accordance with the economic environment). The height of this economic interest in rational resource consumption depends of the height of consumer cost which is involved in the production resource.

The action of each of the types of resources recognizes the possible areas of resource conservation (on Fig.2. – *m*-lines), each of which can be implemented several of *k* possible ways.

So, the definition of the resources types, directions and methods of resource conservation provides substantial invariance of solutions (*k* option means resource conservation), acceptance of which affect on the economic environment (quantitative characteristics of the economic levers of influence).

The second block – "Analysis of the resource conservation" (Fig. 3). *k* option means resource measurement of the structure, rate and resource consumption proportions, also there are held the comparison level of resource consumption with the relevant characteristics of economic development in foreign countries, analyzes of the reasons that hinder efficient resource consumption.

This block provides a solution to the five main tasks. First of all – is the development and implementation in to the accounting practice the system of indicators that will more fully reflect the status of resource conservation.

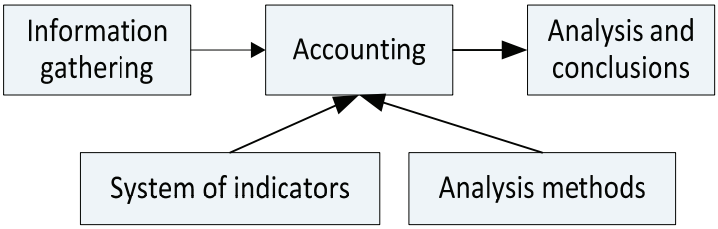

Fig.3.Schemeof the analysis of resource conservation

The second task – is the development of methods of the analysis of resource conservation for each type of resource, explanation of the application of any method in a particular situation. During the analysis is necessary to use all his available methods – starting from methods of direct calculation up to the method of the correlation.

The third task – the development and implementation of resource accounting. Such a system should provide necessary objective information about the process of production resource consumption in specific volume and in a timely manner. The problem above is closely connected with the organization of data collection. Depending on the nature of the data been obtained can be used statistics, conducted periodic random monitoring or one-time research.

The third block – "Strategy and forecasting resource" (Fig. 4) provides for the implementation of complex research, which resulted in the variant parameters defined limits of resource conservation to conventional forecasting horizons and developing appropriate strategy resource.

The basis of this block-research on a wide range of issues in one way or another connected with the production of resource consumption, including the expected results of new resource-saving technological systems and the scale of their development, the probability of introduction of fundamentally new materials and design solutions that able to make fundamental changes in the nature of resource consumption, etc. Based on research developed forecast resource and produced in accordance with his strategy.

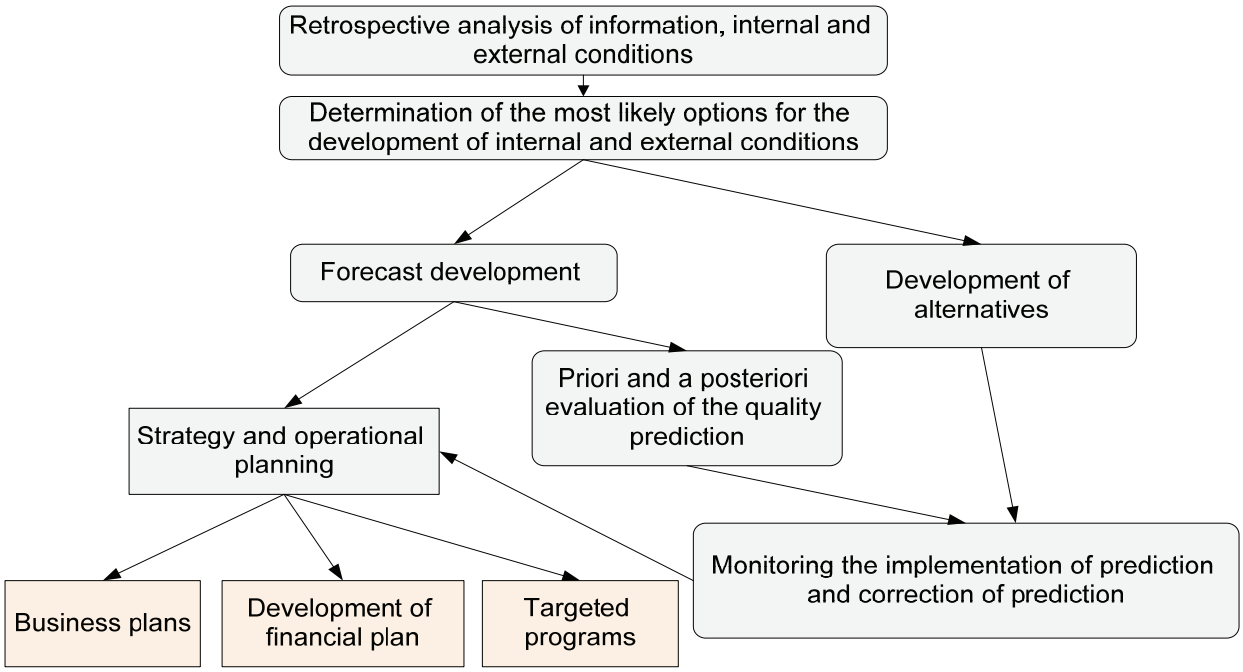

Fig.4.Strategy andforecastresourceconservation

The fourth block – "Block decision". Crucial in the functional system is EMOR block decisions. Decision making is a complex and multifaceted. To management decisions presented a number of requirements, the main of which are: validity, feasibility, timeliness, fairness, simplicity, clarity and conciseness of presentation. It includes a number of stages and operations. The question

of how much and what stage should take place in decision-making that specific content of each of them, managers decided differently. It depends on the skills of managers, a situation, management style and organizational culture.

The process of decision-making is based on the analysis of resource conservation for its forecasts, according to the generated strategy. Decision-making by taking into account the available resources needed to implement the strategy and resource conservation.

The fifth "economic levers" defines the leverage, the nature, boundaries and measure the impact on businesses in matters of production and resource consumption and resource preservation. In Fig. 5 shows the block diagram of the functioning of "economic levers". It is on the principles of a closed system and has a recurring character. For assistance, economic incentives might affect the process of resource conservation at all stages of the life cycle of the resource, the effect of certain results of resource conservation. These results are basis for selecting nature of the economic levers of influence on businesses to ensure the resource, which can be stimulating, compensatory or deterrent.

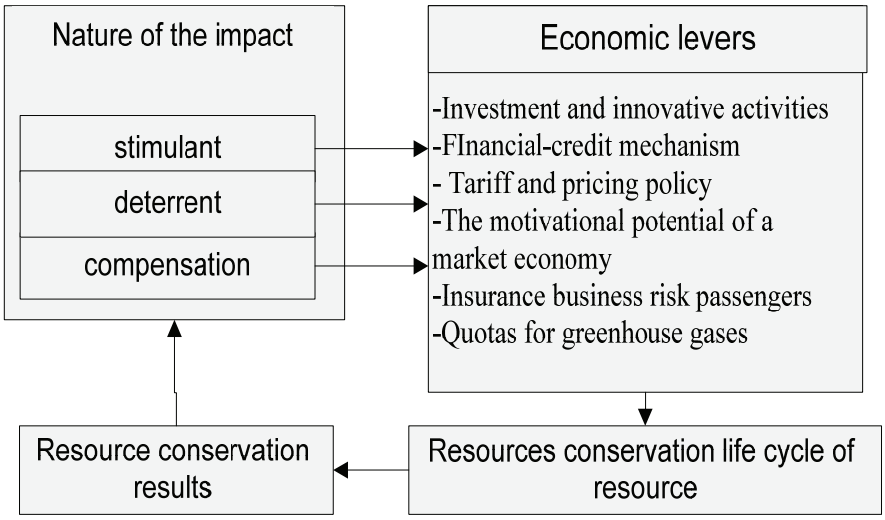

Fig. 5. Block diagram of theoperationof "economic levers".

Conclusions: Thus we can conclude that the concept of "economic mechanism" reveals the essence of a variety of relationships and processes functioning and development of economic objects: from the most complex economic systems of the country – to specific companies. Perfection of the mechanism, on the one hand, requires good governance entities and levels of performance leads to their functioning, successful adaptation to dynamic growth and development under unstable environment. On the other – it is this perfection is a necessary condition for effective operation of the airline, its competitiveness, financial stability, profitability, investment attractiveness and solvency.

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L.L. Lytvynenko, Post-graduate student, V.O. Novak, Ph.D. in Economics, Professor
(National Aviation University, Ukraine)

ADAPTIVE DEVELOPMENT MODEL FOR UKRAINIAN AIRLINES DUE TO GLOBALIZATION

The implications of globalization aviation market have been studied. Prospects of national aviation development under intensification of globalization have been assessed. Proposals for strengthening the competitive position of domestic airlines in the world and European markets have been develop.

In recent years, globalization deepens and accelerates the air transportation market, despite the existing barriers and restrictions. Globalization in aviation appears to accelerate the processes that cover the increasing number of airlines and lead to increased integration and interconnection between them on a global scale, forming a single system – the global aviation community. Development of world air market significantly contributes to the cooperation of airlines within alliance agreements. Relevant to the national economy is the issue of international competitiveness of domestic airlines, as an extension of their internal competitiveness, according to the current global trends. As Ukraine seeks to implement its integration potential by engaging in macro and micro unions (Common Market of Europe, global and strategic alliances of airlines), appropriate sources of capital assets recovery of domestic air transport industry are urgent problems to solve.

The paper aims at analyzing the implications of globalization aviation market, assessing the prospects of aviation sphere of Ukraine in the intensification of globalization, and developing proposals for strengthening the competitive position of domestic airlines in the world and European markets using the adaptive development model.

By analyzing literature sources, [1-5] in particular, several conclusions in researching of the set problem have been made. At the moment globalization has passed the stage of multinational cooperation to a new level – the use of modern computerized information systems, introduction of innovative solutions and horizontal specialization, characterized by integration of functions of equipment manufacturers and service providers on a global basis in fields of engineering, manufacturing and customer service.

The main stimulating factors include globalization, in particular adaptation (adjusting to the differences that exist between countries) and aggregation (overcoming differences between countries because of their grouping based on similarity).

The main manifestations of globalization in aviation industry are shown on Fig. 1.

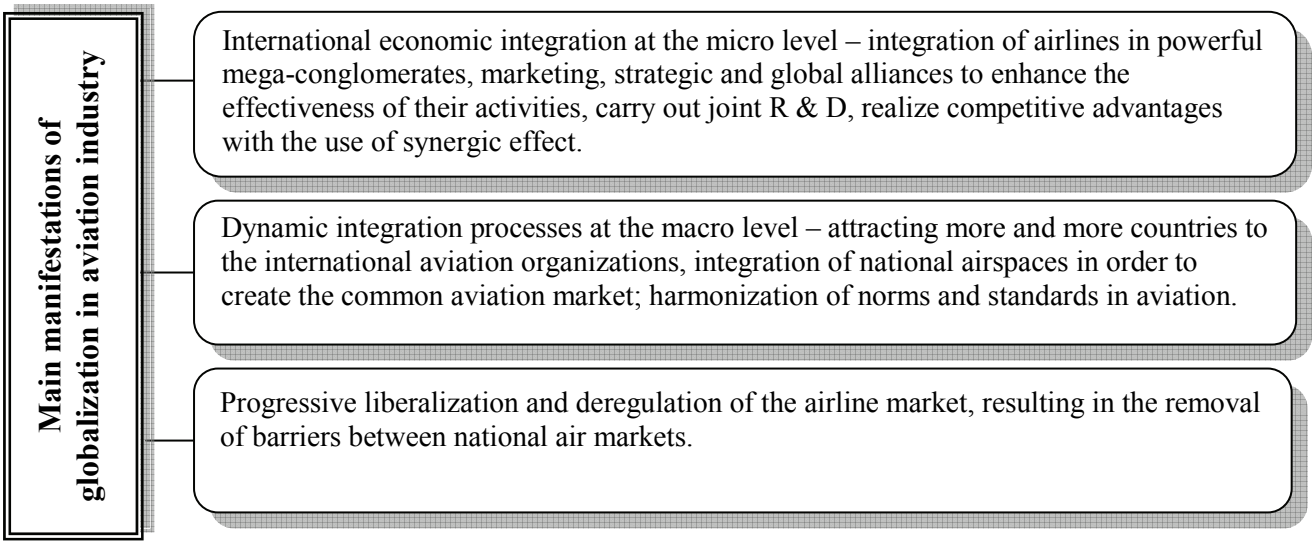

Fig. 1 Main manifestations of globalization in aviation industry

For many years the growth rate of the global airline industry was lower than the general rate of economic growth, mainly due to the influence of two powerful internal forces: globalization and the revitalization of low-cost carriers, increasing constantly their domestic and international passenger base. The main objectives of each airline for adaptation to the global air transportation market is providing safety, reliability, profitability, improve productivity and quality of aviation product, increasing access to global markets increasing the core competencies and intellectual property protection. It should be mentioned that every air company should have its own quality management system providing observation, analysis, forecasting, communications and customer response in complex. Therefore, the system focuses on customer, employees and processes combined with liability management.

National strategy in the air industry is changing as a result of continuous changes in the internal and external environment. However, despite this, measures to accelerate the development of air transport system should be consistent and systematic.

From the authors' point of view, the most actual problems of aviation industry in Ukraine and their solutions are those as shown on Fig. 2.

PROBLEMS OF AVIATION INDUSTRY IN UKRAINE	SOLUTIONS TO THE PROBLEMS
Morally and physically outdated fleet and assets in general; ejected airplanes of Ukrainian airlines to operations in Western Europe with the requirements of ICAO and EASA	- form powerful investment funds for investment of state programs in aviation; - update fleet drawing the investments; - developing the system of public and private leasing; - create an independent national system of aircraft certification based on national research and experimental centers.
Insufficient level of infrastructure development of regional and international airports in Ukraine	- approve the concept of airport development; - develop the network of hub airports and create national hub airport on the basis of SIA "Boryspil"; - prepare of feasibility studies, project documentation, and development of financing mechanisms of complex projects in airport infrastructure development; - renovate and modernize ground infrastructure.
Inappropriate level of the transportation process organization technology, insufficient information provision	- introduct global satellite systems SNS / ATM for air traffic services; - automate and computerize of airlines according to international standards; - implement effective computer network to improve service quality; - create transport logistics complexes system; - form independent body to investigate aviation accidents.
Insufficient development of air routes network	- enter into agreements with other airlines on the sale of commercial rights (interlining, agreement on a block of seats, marketing agreements, code-sharing agreement, an agreement on joint operation of airlines); - creation of aviation alliances or join existing ones.
Insufficient rate of Ukrainian transport-road complex integration with European and global transport systems	- form strong, competitive domestic air carrier; - implement the concept of Ukrainian transport-road complex development; - ensure safety and security by developing mechanisms for monitoring and control.
Inconsistency of legislation of Ukraine in the sphere of aviation with international and European requirements	- finish the formation of national regulatory base system; - improve national legislation in civil aviation in accordance with international requirements JARs.

Fig. 2 Urgent problems of aviation industry in Ukraine and their solutions

The consequences of globalization in its many manifestations are essential for international air transport industry, not only in terms of demand (significant change in scale, character and geography of demand in the world air markets), but also in terms of proposals, international coordination of policies of governments (security, environment, etc.) and the private sector (internationalization of production of aircraft engines, etc.). All these factors have affected the institutional and technological environment of air transport industry.

As indicated in [5], to integrate the domestic air transport system to the EU aviation complex and accelerated response to the changing global environment a number of measures should be implemented, namely: sign the Agreement between Ukraine and the EU Common Market; implement a phased adaptation of air regulation system to the EU legislation: market access, transportation, licensing of air carriers, passengers and other rights; harmonize legislation on civil aviation implement European requirements for safety (JARs) and the requirements of EUROCONTROL, develop relations with European and international aviation organizations; create favorable conditions for the development of domestic aviation industry through implementing the mechanism of adaptation of Ukraine airlines to global air transportation market.

Implementation of adaptation measures to integrate the air transport system of Ukraine with European and global transport systems involves the use of modern innovative investment model of air transport enterprises with regard to integration and globalization trends in the sphere of aviation. It should be noted that lack of budgetary and extrabudgetary funding the development of air infrastructure associated with low volume of air transport industry investment, especially in overcoming the negative consequences of the crisis. The role of private capital as one of the most important sources of financial support and development of innovations in the field of air transport is increasing gradually. To improve the competitiveness of national economy it is necessary to establish a national innovation system and to expand investment opportunities to implement innovative projects, but it is still impossible at the present level of innovative activity of enterprises. It is necessary to increase the share of innovative products in total product and the provision of high-tech services, target investment processes for restructuring the national economy on a new technological basis for strengthening the competitive position of domestic companies in the world market in the long run and reduce level of losses of negative factors of the global environment.

In the result of the conducted research authors have come to the conclusion that due to the increased competition in air transportation, orienting of carriers on attracting new investors and many other factors the formation of innovative integrated business models of air carriers focused on the interests of consumers have been formed. Airlines seeking to survive in the market and gain greater market share, adapting their business models to the conditions of global competition. Thus, in the conditions of air transport globalization it is important to use existing opportunities created through the implementation of the adaptive model of air transportation in Ukraine to ensure the stability of the competitive position of domestic airlines in international markets.

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T.I. Bilenko, Ph.D.,
(National Aviation University, Ukraine)

EXPECTED CONSEQUENCES OF UKRAINIAN ECONOMIC INTEGRATION WITH EU

The article deals with the economic problems of foreign relations of Ukraine and the EU and the cost estimation of organizational arrangements.

All aspects of potential absorption of a new candidate state by the EU are imposed in the articles of Maastricht Treaty (1992), Copenhagen declaration (1993) and Treaty of Nice (2003).

The convergence criteria for each country supposing to become EU member concern:

1) inflation rates;
2) annual government deficit;
3) government debt;
4) exchange rate mechanism;
5) long-term interest rates.

Especially, inflation in the proper country must be no more than 1,5 percentage points higher than the average of the three best performing member states of the EU. The ratio of the annual government budget deficit to gross domestic product (BDef/GDP) must not exceed 3% at the end of the preceding year. At the same time some exceptional and temporary excesses may be regarded for the exceptional cases, but those, percentage excesses are not strictly estimated.

The ratio of the gross government debt to GDP musn't exceed 60% at the end of the preceding fiscal year. If not, this ratio must be accordingly diminished to the recommended value at a sufficient pace.

The applicant country is obliged to join in two years the European Monetary System (ESM) and should not have devaluated its currency during that period in order to prevent gaining the export privileges due to the devaluation of its currency. The last is the point of concern of the EU authorities because it would disturb the main principles of EMS and its trade policy prescriptions.

The nominal long-term interest rate must not be more than 2 percentage points higher than in the three lowest inflation member states. It means that the lowest inflation countries in the EU precisely have the lowest interest rates (just according to the famous I. Fisher's effect) and the main aim of such prescription is to prevent the massive capital flows to the new member country due to its higher and more attractive interest rate, especially the flow of speculative capital that would influence upon the currency exchange rates and the stability of capital-flow balance in its Balance of Payments.

May be, it is too early to estimate the expected consequences of Ukrainian economic integration efforts, because just now we have too much differed figures of nominal interest rates: 3.5% - 8.0% in Europe in Euro and in Ukrainian and 11% - 12% in Euro, while the interest rates in Ukrainian commercial banks are nearly 20% - 23% in Hrn.

And, of course we can resume that the main purpose of setting the convergence criteria from the EU towards the candidate country like Ukraine is to maintain the competition conditions and price stability within the Eurozone even with the association or inclusion of new member states.

The requirements to Ukraine to become a member-state according to the EU-Ukraine Action Plan include the following:

(1) Prescription about the companies operation, providing the eligible business environment for companies:

a) adoption and effective implementation of competition and bankruptcy legislation in Ukraine;

b) abolition of discriminatory measures affecting both - European and Ukrainian companies;

(2) Prescriptions about establishment:

a) effective implementation of conditions under which companies invested are maintained;

b) prescriptions that European and Ukrainian subsidiaries or branches receive not less favourable treatment than that granted to its own nationals. Ukrainian companies in the new Member States should be able to open brunches in other EU Member states and high standards of protection for investors are applicable throughout the enlarged EU;

c) identification of barriers to establishment in order to avoid them by reviewing the Ukrainian legislation and to remove the restriction on establishment;

d) effective activity of a central coordinating body on the way of establishment facilitation.

(3) Company law in Ukraine:

a) improvement of auditors independence situation;

b) creation of unified state register of legal persons and physical persons – entrepreneurs and companies – and publication of information about the organizational and financial situation of companies in order to ensure the administrative control over the incorporation of a company or the legality of certain acts;

c) adoption of a Code on corporate governance.

Analysing all precedent prescriptions, we can estimate, that most of them suppose the proper activities of Antimonopoly Committee and concern the Bankruptcy legislation and the special Competition policy in Ukraine on its way to EU.

Their aims in most cases are:

1) to prevent state excessive control ever Ukrainian companies in the future European framework ;

2) to abolish or to control the amalgamations of companies;

3) to trace the taxes payments of Ukrainian companies and disclose its financial position;

4) to work out policy towards Ukrainian companies registered beyond the EU, that is in Virgin islands and other offshore zones;

5) to produce the defending of interests of "old" EU – countries' investors;

6) to disclose the legal stuff of entrepreneurs and owners of companies in Ukraine (while the disclosure requirements in foreign competitors countries may be lower);

7) to converge the corporate governance Code with the European one in spite of existing differences in this sphere, especially, in the field of entrepreneurship laws codification.

So, Ukraine, that is considered to be among ones potential for acceding must compare its costs and benefits, must analyse the full value of juridical and administrative measures implementation and, of course, must estimate the necessary time-period for all needed changes actualization.

Among the major costs there would be:

(1) high administrative costs for creation of the publicly open national registration system for companies;

(2) high costs for creation of specialized court for intellectual property rights;

(3) high costs of legal providing the bankruptcy procedure inside the European legislation sphere;

(4) competitive losses from the Ukrainian companies informative disclosure;

(5) high costs of statutory audit;

(6) high costs of all externalities involvement into the prices of Ukrainian goods and services, especially for export, that had been not yet appreciated and included according to the Ukrainian price-charging practice.

(7) competitive disadvantage of Ukrainian companies due to the changes in the principles of state aid providing, because the new competition rules will ensure, that the aid is granted to the individual consumers without discrimination related to the country of the products being purchased by Ukrainian customers. (So, what country products sale should we sponsor by paying aid to the Ukrainian consumers?)

(8) State aid to the regions with low standards of living or huge unemployment must be reflected in the alternative entrepreneurship development (small and medium business that might be financed and credited at the most beneficial conditions), but not in the form of maintaining the huge

business or local budgets need. Otherwise this expensive state aid would be spent inefficiently and would provoke the future tax increase to compensate the tremendous state expenditures in the "aid" form.

Speaking about the state aid taken separately, we must emphasize that EU legislation proclaims accountability, transparency, limited continuity and scope of state aid. But Ukrainian legislation has no a single law of regulations that define the principles, objectives, instruments and means of control of the state aid. There is also no a special institution in Ukraine that controls the volumes and directions of state aid, that is being still regulated by the Antimonopoly Committee of Ukraine.

The EU state aid definition supposes:

1) special tax regimes;

2) government guarantees given to the individual companies or sectors;

3) understandable procedure of subsidies given to the proper firms.

Thus, Ukraine needs a new law on the state aid and a new state aid system with the reglamentation of choice principles of the beneficiaries of state aid.

But in general, the main aim of the new Ukrainian state aid policy on its way to EU must be an increase of social equity and living standards all over the country and the maintenance of high comparative competitiveness of Ukrainian business in the European surroundings.

Speaking about the expected consequences of future adoption the EU competition rules by Ukraine, we are not sure, that it will result in lower prices, because price level in any country depends not only on the rules of competition policy, but from hundreds of other independent factors, connected with incomes, purchasing power, money supply, inflation rates, prices on inputs and natural resources prices first of all. Except this, the expectations about the lower prices in Ukraine thanks to the future obeying the European competition rules must be considered from the point of short-run and long-run consequences that may not coincide.

By the way, the state aid to the agriculture is considered to be an exemption to the EU general rules, thus Ukraine's agriculture will get the state aid based on the national approaches, remaining to be one of the forward branches in Ukrainian economy.

The problem of state aid allocation is a part of the national economic sovereignty of Ukraine. At the same time the problem of state aid is connected with the problems of state budget, abolition of tax privileges, export capacities of Ukrainian companies, state sector of the economy and its competitiveness.

The elimination or diminishing of state aid to the large industrial enterprises in Ukraine will result in the short-run unemployment increase, that's why some of the economized state money must be spent on the "self-hire" labour system establishment for those excessive workers who were released, and the final effect on the state budget will be eliminated.

Conclusions

We must take into consideration that the adoption of EU competition policy by Ukraine will benefit it in the long-time period, but the arrangement of a new State aid control system will increase the shirt-term costs of integration and lay heavily on the state budget expenditures of Ukraine.

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M.Y.Grygorak, M.B. Budnichenko,
(National Aviation University, Ukraine)

AIR CARGO VALUE NETWORK MANAGEMENT

Reviewed the main features of the value network concept, analyzed their main actors of air cargo industry, and defined the idea of air cargo value network management possibility.

Problem definition. During the last decades world economy noticed an active development of supply and value chains in various areas. World experience, state and supply chain management transformation trend analysis states this scientific research direction to be constantly examined, as changing market environment requires respective managerial decisions.

Need for new approaches and value chain management tools is based on several factors: higher frequency of world crisis, which brings massive demand and supply fluctuations; active usage of e-technologies in business, which changes sales forms and modes on the market; goods value individualization for consumer, which requires deeper goods production and distribution process integration; tight value chain structure, linear tights between value chains does not prevent from 'bullwhip effect', e.g. distribution channels overstocking. In order to decrease goods flow total cost we must use more complex relationship structures in value chains and switch to value network concept.

Value network concept has evolved from mid 90-s and represents integration of value chain, supply chain and network studies. It generates economic value through complex dynamic exchange between network enterprises, its customers, suppliers and strategic partners. Value network characteristics are leadership, partnership, client orientation, actors' interrelationship and relation management. These features might have a common character, although they depend on economic activity type and area competitiveness.

Part of the problem to be examined. Air cargo is a wide, complex and multilevel system, with the chains of different actors – national and international carriers, forwarders, service providers, etc. Studies on their relationships trends and nature in complex market environment show the logic of value network development in air cargo area is not much examined.

Main discussion. To summarize global air cargo market development trends, we can define four actor groups which play an increasingly important role in consignees, forwarders and their clients service:

- Air-mail companies
- International courier companies
- Integrators
- (Air) Freight forwarders

Air freight transportation system consist of service-providers, which 'provide any service, related to freight transportation by air, including multimodal operations, forwarding, express-delivery, brokerage and others' [10].

Key actors and their client database as well as optimal characteristics identification are required for understanding balance between cargo transportation demand and supply features, which then helps to identify customer service strategy and sustainable air cargo performance. Fig.1 shows main air cargo actors and their relationships, which represent the size and complexity of modern air-freight business.

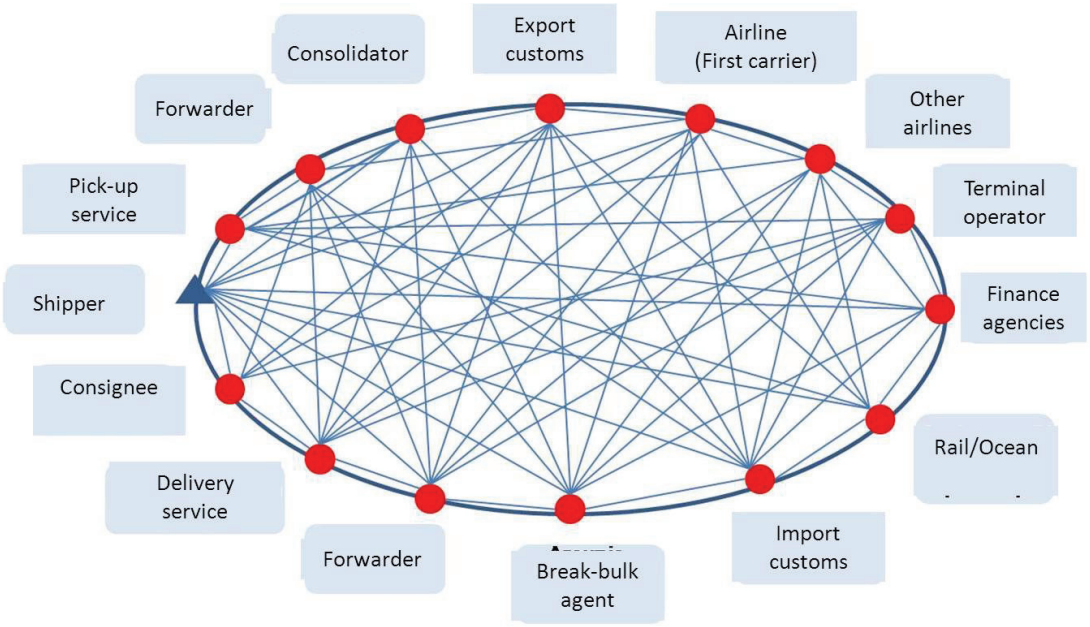

Fig.1 Air cargo industry actors and their links

This figure reflects various multidirectional and complex socio-economic relationships of different air cargo market. All these actors are involved into air cargo service value creation, and so the value network concept can be used for their optimization.

In our opinion, value network management in aircargo is based on two important preparation stages.

Stage 1. Define level of analysis. As different aircargo actors play different roles in customer value creation, we suggest to differentiate 4 levels of decision management.

Level 1 identifies aircargo market as network, which requires forecasting and governance in order to define key actors and understanding of network competition.

Level 2 defines airline behaviour in strategic alliances. Sometimes this level is called strategic network. Main decisions include those of defining feasibility of entering such network and managing position in network.

Level 3 – focal nets level, which is related to various forms of resources usage and business-partners relationships on a certain goods and services market. Airline can be a part of different focal nets at the same time and so can optimise its processes and resources.

Level 4 defines individual airline-supplier and airline-customer relationships from organizational and analytical perspective.

For analytical purposes we can argue that macro-network, e.g. industry as a network, is the widest and most common level of network research. Moreover, macro-network level can be further divided into smaller units of analysis – individual partnership clusters. Relationship set – or relationship portfolio – can be studied as the one, which consists of various dyadic relationships. Possibility for controlling resources and activities of another actor normally differs on each of these levels.

As the network analysis level defines complexity of tasks, which have to be performed to reach objectives, it is very important to find methods and frameworks to be used for value network research. Paper [5] proposed ARA model (actors, resources and activities), which is a practical tool for building and analysing of value network and allows to describe links between actors, resources tights and process synchronization.

Stage 2. Define starting point. At this stage it is important to define network leader, which governs it, or which actor perspective value network management possibilities will be studied. For instance, if we define focal net as our analysis unit, airline or integrator can be a starting point (e.g. in Lufthansa Cargo Group value network the starting point can be Lufthansa airline, as a network leader, as well as each of the companies-group members; same for value network as a strategic

alliances Once World or Star Alliance).

On the abovementioned foundation stages 3 major network management levels are built up [8] (Fig.2).

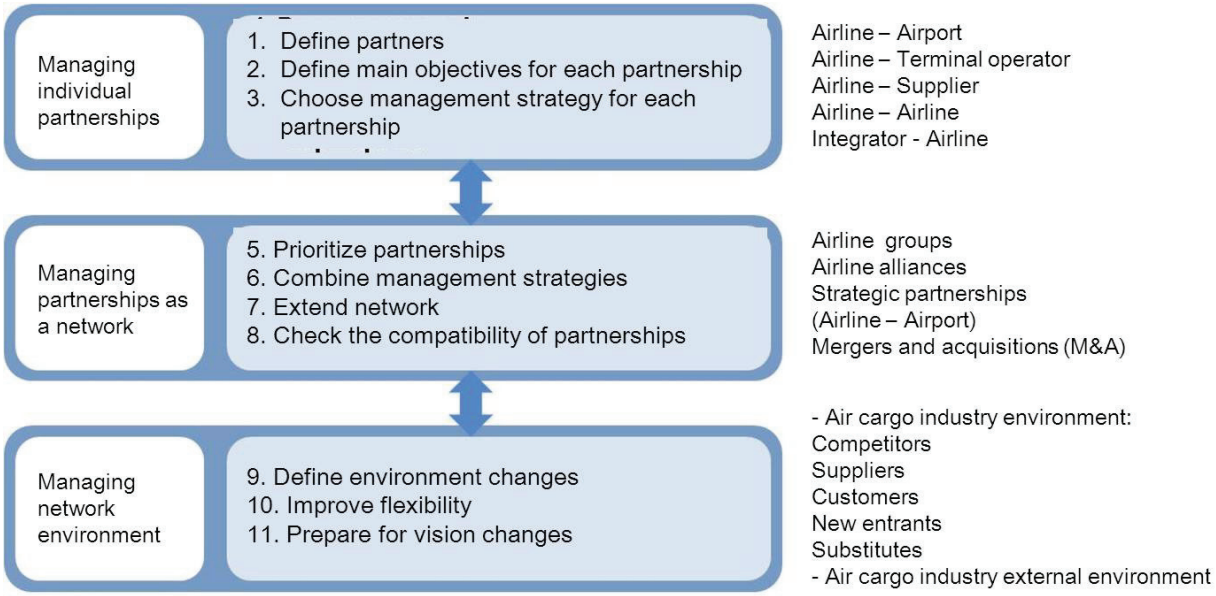

Fig.2. Three levels of air cargo value network management (based on [8]).

The first management level must start with defining partners and objectives, and management strategy for each of partnership. On the second level management perspective expands. Need to prioritise partnerships, make sure that objectives are aligned within network and are compatible with partnerships. Third management level considers network external environment and how its changes impact partnership network and if there are needs for reorganization. Value network management strategy must comprise all three levels.

In order to sustain operations in any situation, value network partner relationships must be flexible. One of the management challenges is improving such flexibility in the network. Solution is to build more of flexible long-term relationships, which are based on trust and common values and principles instead of hard, contractual-based partnerships. Talking about changes which can modify industry, just flexibility is not enough. Central organization has to prepare for being able to renew its strategies and vision. It must review who it is willing to form value network. For example, earlier people used to buy airline tickets through travel agencies, and today tickets are mostly sold online. This has changed networks between airlines and agencies, which now have to find a new role.

Conclusions

Value chain concept adoption into a network business environment enabled value network concept to emerge, which allows airline enterprises to improve service speed, market demand response, provide individualized offerings, enhance customer value and offer self-adopting dynamic environment for ‘mutual growth involvement’ of all actors. Authors suggested methodological approaches to airline value network management, which starts with defining network analysis unit and starting point (leader), and includes three levels: (1) managing individual partnerships, (2) managing partnerships as network, (3) managing network outside environment. This article can serve as a prerequisite for further airline value network performance management and measurement research as a part of value network management.

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T.I.Bilenko, Ph.D.,
(National Aviation University, Ukraine)

THE INFLUENCE OF BANK CREDIT SCHEME ON THE INVESTMENT PROCESS OF UKRAINE

The high figures of credit interest rates in the Ukrainian banking system may prevent the development of innovation process. The new approaches to solve problem are proposed in this article.

The main task of Innovation development model in Ukraine is the realization of such macroeconomic goals as the achievement of economic growth and increasing level of material and technical base, gaining of ecological balance and improving of social component, particularly in terms of improving conditions of work and recreation and decreasing of economic poverty. The difficulties, which innovative activity of economic subjects faces, are disposed in the sphere of less financial funds for current activity, including working capital, in the existence of too high rates on credit in commercial banks, in the insufficient amounts of government financial support of the state enterprises, in existence of high economic risks and the lack of effective opportunities to reduce the payback period of funds invested in modern equipment acquisition and implementation of advanced scientific and technological projects. The financial difficulties on the way of innovation development in Ukraine should also include the lack of involvement of domestic insurance companies in the investing process, the practical absence of venture capital firms with strong financial resources, the lack of practical possibilities for investment in the Ukrainian innovation business by local independent investors and especially individuals through the existence of closed joint-stock companies, as well as the great value of every one package of shares in privatization of state enterprises and attracting a strategic investors. Besides, many problems are connected with the stocks creation of a particular sphere of research infrastructure, which would have tax benefits and equity system of profit sharing participation of its representatives in the real sector incomes after the implementation of “know-how”.

Thus, the investment process in Ukraine is a complicated multifactor system, that has its internal stimulating and deterrent components simultaneously, that contradict with the investment growth or even prevent the development of innovative process. Ukrainian banking system, that is aimed on lending money in order to finance investment projects, however makes the last economically unprofitable, and thus also corresponds to the opposing factors.

The problem is that the bank interest rate on credit, that according to all theoretical models, being an internal factor affecting the demand on investment by the business sector in Ukraine, is too high. So, the preceding year 12.5% -14% interest rates in foreign currency and current 20% -22% in UAH – comparing with bank rates for credit in the U.S. and Western Europe (3-8%), Japan (0.3%), Russia (9.5% - 15% in rubles) - is an extremely high price for credit. Although the conservation of high interest rate of National Bank of Ukraine, including the relative increase in interest rates of commercial banks, belongs to the arsenal of monetary policy of "expensive money", directed against inflation in the country, however, the rising cost of the credit because of too high interest rates leads to the fall down of investment demand and to the deceleration of investments.

The reason, that traditionally explains the existence of too high nominal interest rates in Ukraine is the including of inflation rate to the calculations of nominal interest rates together with the real interest rate. The last is calculated on the comparative basis with the world interest rate on credit, although according to the theory, it must come from the level of industry average rate of the investment project profitability. Thus, if the global real credit rate is 5% in foreign currency, then this figure is added with the estimated expected for the current year “currency” inflation of 7% , and we get the nominal rate on loans in foreign currency near 11% - 12% per year. The annual interest rate in UAH is much greater than in the "foreign currency" because native form of inflation is added to this "foreign currency" interest rate and we receive interest rate in hryvna loans close to 22% - 23%, depending on the bank, of the subject - the borrower, of the type of loan, from credit

rating and credit history of the borrowers, from the expectations of risk (as well as currency fluctuations and changes in the monetary policy of the National Bank of Ukraine, which controls the direction of changes in the discount rate). So as of 27.02.2012, National Bank of Ukraine discount rate was 7.75%, whereas interest rates of VAB-bank for corporate customers for the purposes of financing activities were 25% yearly in hryvnas, and the interest rate on consumer credit for individuals in "Privatbank" was 19.92% per year in hryvnas.

If the Ukrainian entrepreneur takes credit at 20% - 22%, what should be his profitability of the project, what should be the pace and terms of its return period? Under these unfavorable investment conditions Ukrainian entrepreneurs that still wish to take credit under such conditions, of course, will be interested, and even forced to raise significantly their prices for manufactured products. This mode of operation is inherent and necessary for the business sector, because credit is too expensive.

So, let`s take together the reasons and consequences: high rates of interest for the credit in Ukraine not only withdraw small and medium business which profitability ratios don`t exceed the high bank credit rates from the real industrial field, but also encourage the medium and large business, that have taken loans, to raise prices and, finally, leads to the increasing of inflation in a country.

To avoid these negative consequences, especially the turning of inflation and slowing down of investment process, the existing scheme of bank lending must be changed. Thus, the logic is enough easy. Banks will propose the entrepreneurs, who want to take credit, to take it at low accepted rate – at least 8% yearly in hryvnas. Then an agreement between the bank and the borrower is signed. In the end of a year the entrepreneur, while turning back the credit with a mentioned interest rate, also has to pay the additional interest rate to the bank, which actually was added by inflation during the current year. For example, if the actual inflation rate was 5%, it means that you also must additionally pay to the bank those 5% of the loan. And the full interest rate will be 13%.

The inner logic of this scheme is considered not only in availability of microeconomic (as far as the firms usually tend to increase prices for their products), but also in macroeconomic effect: all entrepreneurs-borrowers understand, that their desire to raise prices on their product will have a consolidated effect at the end of the year (rising of prices or inflation level). The resume is: don't make harm to others, because you'll have to pay for it in the form of compensation for inflation. Thus, the macroeconomic effect of this scheme will be: at first: a common propensity to overcome inflation and, secondly, credits will fall in price. The scheme will open the ways to develop the investment processes and to achieve real innovative model of economic transformations in Ukraine.

Under these conditions, an important problem in the sphere of bank lending in Ukraine, including consumer lending, is the existence of a specific scheme of debt returning by a borrower to a bank-lender. As you know, taken credit is repaid by returning of a corresponding part of the debt with interest during each month. But such conditions of credit returning - not once a year, but each month - significantly increase the effective year interest rate on the credit compared with the declared interest rate, which was noted in a contract conditions between the borrower and the bank.

$$r_{adjusted} = 2 \cdot 12 \cdot \frac{r_{declared}}{n+1},$$

where 2 – coefficient for simplification of calculations formula; 12 – frequency of visiting the bank to return the share of debt (monthly); n – number of demanded visits (10 visits to the bank as in our example).

For example, if the borrower takes a loan of $1,000 in a bank, and the year interest rate on credits is declared by a bank as 10% per year, moreover the bank demands to return the part of a debt together with proper interest part each month in 10 visits (for example), it is necessary for a borrower to get acquainted with the simplified mathematical formula for recalculation of year interest rates for credit in a year time period, or the adjusted rate, which actually he has to pay. This formula has such a look:

$$r_{adjusted} = 2 \cdot 12 \cdot \frac{10\%}{10+1} = 21{,}8\%.$$

Thus, it means that the borrower has no idea that starting to return the first part of a debt from

the first months, when he took a credit, he actually will pay for credit not 10%, but 21.8% yearly, which is actually hidden by the bank in the specific conditions of credit returning – not once a year at the end of the year, but 10 times monthly. By the way, if this credit would be given correct, on the whole year and the debt must be completely returned at the end of a year with one visit to a bank, then the interest rate will be really 10%, as it was agreed at the beginning.

$$r_{adjusted} = 2 \cdot 12 \cdot \frac{10\%}{1+1} = 10\%,$$

where first 1 - this is the frequency, or 1 year; second 1(n) - in this case it is the number of visits to a bank for the debt return: that is once a year.

Thus such manipulations of commercial banks with their borrowers lead to an actual increase of interest rates for credit, unreasonably increasing bank profits and putting borrowers in a quite difficult situation, sharping the problem of loan defaults from the population side. Such bank "tricks" will negatively influence even the most banks, creating problems for them with credits return, and hence the profitability of most banks. But at the same time, it is clear that monthly getting money from their borrowers to return the appropriate share of the credit, banks are able to have money from each one borrower a certain amount and then to work with that money, giving it as a credit to another borrower under the same high, "Ukrainian" percentage. Thus, 21.8% adjusted interest rates on credit - it is actually a real income of the bank, as far as the bank can give rise to those amounts that the borrower returns it in a month, then through another month and so on. Thus the down payment on February 1 will "work" as a new bank credit granted for next 11 months, returning more and more money through multiplicative effect for. And same happens with each portion of credit return to the bank by the borrower. Thus, in the depths of the banking system the special credit multiplier operates, accompaning the another one that it familiar to all professionals as money multiplier $\mu_{money} = (c+1)/(c+r)$. This credit multiplier is formed by the introducing of banking rules for loan returning through the monthly contributions (fortunately, not weekly!). So, banks increase their lending capabilities, and thus total income from banking operations. But at the same time, if the borrower takes credit, for example, to fund innovative projects in the real production sector, the following conditions of credit proposed to him by the bank, are forcing him to return in the coming months the money which he have not enough time “to get back”, or to recover as profits from the project. This is not surprising: there exhists the payback period for the new equipment; if a loan acquisition for it was taken, there is a general term of any project profitability. And the project itself, with its depreciation rates and rates of return is usually calculated at time basis of 1 year. In such a difficult situation when he must almost immediately return a loan, having not yet received profits, the entrepreneur will operate within the three scenarios:1) to raise unreasonably prices for his or her manufactured goods; 2) to search money, borrowing them from other banks, increasing the market of banking derivatives and his own financial debt already to several financial institutions simultaneously; 3) to take a difficult bankruptcy decision under the inability to return the taken loan at time or to leave the business, to declare default, for example on corporative obligations or Eurobonds, etc.

Conclusions

As a conclusion, let's determine, that this bank credit scheme earns a notable profits to banks during short-term period, but as for long-term, its application leads to financial crises in the market of derivatives, leads to sharpening of problems with loan defaults by borrowers and, more importantly, in macroeconomic terms, on the background of high figures of the interest rates for credits, particularly in modern Ukrainian banking system, leads to a significant reduction in opportunities for innovative activity in the real sector, delays the development of the newest technologies. And all this situation appears on the background of permanent inflation and difficulties with the support of financial stability in the financial sector.

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Yu.I.Dyiak
(National Aviation University, Ukraine)

BARRIERS TO FORMING POLICY IN ENERGY SAVING

The article provides an overview of barriers to the implementation policy in energy saving and energy efficiency, distinguishes between paradoxes of energy efficiency, suggests that there is a large potential for energy saving and energy efficiency measures

In the current economic and energy crises energy saving and energy efficiency serve as an important direction in the energy sector that is able to withstand these challenges. Implementing energy saving measures will allow saving the limited economic resources, postpone depletion of minerals and it is considered one of the best alternatives to reduce carbon dioxide emissions.

Increasing energy efficiency concerned as central strategy for sustainable energy system, which will aid companies and private households to shortage the outcomes, lowering the emission of green house gases and other polluting agents. Implementation of energy-saving technologies will decrease dependence from import and also significantly increase safety of energy supply for proper services.

At the same time, switch from fuel import to investment in energy efficiency, will result in the increase of national output and employment mainly in building, electric and machinery spheres. And finally, improvement in energy efficiency inside the country can lead to the increase of export abilities for new energy-saving technologies.

However, energy saving does not justify the expectations and demand for energy is growing, despite the economic and environmental benefits, that can be derived from implementing energy saving measures and energy efficiency and political support. There can be distinguished two paradoxes of energy efficiency. The first paradox is related to the fact that energy saving measures and energy efficiency have not been widely applied, despite the social and economic benefits. The second paradox is related to increasing in total energy consumption, despite significant improvements in energy efficiency.

So the first paradox, the so-called energy-efficient paradox, while energy saving and energy efficiency measures give certain economic advantages, the level of investments in them does not reach a certain level, which would correspond to these advantages. There are two diametrically opposing views trying to explain causes of this paradox.

Some researchers state that so-called paradox of efficiency is not that: investments that actually occur are economically optimal, taking into account that energy markets are efficient. Therefore, we can make assumption if investments in energy saving measures and energy efficiency are less than expected, it can be explained by decisions arising from the economic rationality of consumers. Thus, differences in the assessment of technological potentials are explained by the behavior of consumers, which is not taken into account, and a tendency to underestimate costs and over-valuation of profit if the research of technological potential was made by not objective institution.

To explain the energy-efficient paradox other authors say that energy markets are full of failures. Really, some researches show that consumers are ready to pay more for improving energy saving and energy efficiency than they cost, but later they are not implemented, it means there are market problems which prevent reaching of effective level of energy saving and energy efficiency. In the literature are pointed and investigated different reasons that may explain the lower than expected investments in energy saving and energy efficiency:

- low utilities' price will lead to the fact that investments in energy saving measures and energy efficiency will not be profitable;
- investments costs are higher than predicted technological research;
- investments in energy saving and energy efficiency are usually irreversible it is difficult to return them if the project is considered unnecessary or unprofitable;

- uncertainty associated with energy prices may also make investments less profitable;

- lack of full information while making investment decisions;

- limited rationality - even with all the information the consumer cannot or is not interested in providing an integrated accounting to make the best decision;

- slow process of spreading technologies for energy saving and energy efficiency, which depends on uncertainty and heterogeneity of consumers;

- conflict of incentives that occurs when one person invests in energy saving and energy efficiency measures and benefits of this gets another person;

- difficulties in accessing the capital markets can make difficulties in proper financing of energy saving measures and energy efficiency;

- heterogeneity of consumers, actually investments that may be beneficial for some consumers, they may have the opposite effect for others.

Thus, there are many reasons that explain the low level of investment in energy saving measures and energy efficiency and understanding of these reasons is central for developing appropriate policies to promote these measures because of significant increase of investments are not necessarily will result prosperity.

The second paradox of energy efficiency or the rebound effect is the situation when energy efficiency increasing leads not to a proportional reduction but in contrary increase demand for utilities. First put forth by British economist William Jevons in 1865, the Rebound Effect proposes that energy efficiency is counterproductive, because energy conserved in one sector is automatically put to use in another sector. Jevons' theory was based on an energy economy that had only coal as a source material and industrial production was the main economic sector. But his argument has been repackaged and repurposed to cover micro as well as macro level impacts. Now it has been extended to question energy efficiency (and carbon emissions reduction) efforts in general.

In other words, the rebound effect determines the difference between energy efficiency and energy saving: first one is relative measure, and the second is an absolute measure of reducing energy demand. The rebound effect assumes that a direct cause-and-effect relation between increasing efficiency and reducing demand is absent.

There are three reasons for the rebound effect, which is usually used for the classification of its forms:

- direct (price) effect occurs when the energy efficiency of the process or products increases, and their implicit costs are decreases. If demand is elastic at a price then reducing price on utilities would increase their consumption;

- indirect (income) effect occurs when energy efficiency increases, as a result the real price of energy decreases, thus a profit increases and it can lead to the consumption of other energy products and increase the demand for utilities;

- macroeconomic effect occurs when increase in efficiency stimulate economic growth.

There is actually question of rebound effect practical verity because of it dependence on the elasticity of the price and income, on the transition opportunities from one type of fuel to another one and on the industrial economical structure. It should also be mentioned that in any case when the rebound effect is lower than 100% there will always be an observed reducing energy demand and this reduction should be investigated in comparison with the scenario without the use of energy saving measures and energy efficiency measures**.**

Taking into the account all the above-mentioned considerations, we can conclude that the implementation policy of energy saving and energy efficiency measures should not be considered as objective in a whole and should be regarded as a means for the best and most rational distribution of scarce resources, improvement of the environment or reducing of dependence on the imported utilities.

In the article 3 of the Law of Ukraine "On energy saving" is carefully written the principles of state policy on energy saving. Main principles of the state energy saving policy shall be as follows:

a) creation of interest in economical and legal conditions in energy saving for legal and physical entities by the state;

b) realization of government control of activity in energy saving on the basis of application of economic and normatively technical management measures;

c) priority of energy saving requirements during realization of economic, administrative or other activity, related to production, processing, transporting, storage, making and use of fuel and energy resources;

d) scientific ground of standardization in energy saving and setting of norms of the use of fuel and energy resources, necessity of following energy standards and norms at the use of fuel and energy;

e) creation of energy saving structure of material production on the basis of complex solution making on economy questions and energy-savings taking into account environmental requirements, wide implementation of modern energy saving technologies;

f) the obligatoriness of state examination on energy saving;

g) promotion of economic, environmental and social energy saving advantages, increasing public education level in this area;

h) combining of economical encourage methods and financial responsibility with the aim of rational use and economical expense of fuel and energy resources;

i) establishment of paying for direct losses and inefficient use of fuel and energy resources;

j) energy saving solution problems in combination with realization of the energy program of Ukraine, and also on the basis of wide intergovernmental collaboration;

k) stimulation of the rational use of fuel and energy resources by the combined production of electric and thermal energy;

l) gradual transition to the mass application account devices and consumption control of energy and fuel resources;

m) the obligatoriness determination by suppliers and consumers of the released volume of fuel and energy resources by indications of account devices of fuel and energy resources consumption in the case of their presence;

n) implementation of the energy marking system of electrical equipment of the domestic setting.

Conclusions

The implementation policy in energy saving and energy efficiency should be regarded as a means for the best and most rational distribution of scarce resources, improvement of the environment or reducing of dependence on the imported utilities.

The energy sector should switch from the policy of energy supply for extensive development of the Ukrainian economy, which it has been pursuing for decades, to energy supply for sustainable economic development. This is the objective towards which the developed countries of the world are oriented. There is no alternative to that.

There are all pre-conditions for realization of energy saving and energy efficiency policy in Ukraine, however this process will require subsequent researches and careful analysis of current situation, with the aim to reach socio-economic and ecological benefits by the most effective way.

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V.Klymenko, phD
(National Aviation University, Ukraine)

COMPETITION ADVOCACY IN UKRAINE

The aims and objectives of competition advocacy are determined; the forms and tools of competition advocacy in Ukraine are analyzed. The recommendations for improving the effectiveness of competition advocacy in Ukraine are settled down in the article.

Competition advocacy is rather new direction of competition policy in Ukraine. A commonly accepted definition of competition advocacy is that it includes all activities of a competition agency that are intended to promote competition apart from those that involve enforcement of the competition law [1].

Competition advocacy involves such competition agencies' activities that address existing and proposed disproportionate public restrictions on competition and build public support for competition and markets. Competition advocacy and enforcement are complementary. Strong enforcement make stakeholders more receptive to advocacy and successful advocacy may facilitate enforcement.

The opportunities for competition advocacy are numerous, and take several different forms, such as:

- privatization;
- legislation, government policy and regulatory reform;
- competition policy in regulation;
- building a competition culture [2].

The competition policy in Ukraine provides by the Antimonopoly Committee (AMC). The AMC's activities in the sphere of competition advocacy should be aimed at solving of the following major problems:

- creation of constructive dialog between antimonopoly authorities and state and local authorities, responsible for forming and realization of regulatory policy, aimed at minimization of restrictive influence towards competition from the direction of measures of regulation of the economic operators' of the market activity that are being elaborated or applied;
- increase of all the groups of the society' awareness of the importance of competition and possible loses for consumers and economy as a whole if competition is restricted;
- informing Ukrainian and foreign companies about existing rules of competition relations' regulation aimed at predictability of economic activity and raise in attractiveness of Ukrainian economy.

The AMC's activities within the Executive Branch include, for example, its participation in interagency task forces dealing with a variety of regulatory issues arising in areas such as telecommunications, intellectual property, energy, healthcare, insurance, finance and export policy. Whether by informal advice or formal comment, the AMC's role in this regard is to advise the other government agencies regarding the competitive impact of proposed policy, legislation, and agency action.

For example, AMC has worked with 860 authorities and analyzed 1456 decisions of state authorities in 2010. AMC refused to negotiate 167 projects of normative and legal acts, gave 84 comments and proposals for acts to bring them into line with the requirements of the law on protection of economic competition.

The total number of recommendations of the Antimonopoly Committee of Ukraine relating to the limitation of monopolies, development of competition and prevent violations of the law on protection of economic competition was 2027 recommendations, 75% of which was accepted by the authorities [3].

The realization of competition advocacy aims is impossible without the attraction and active

interaction with experts of international organizations and foreign competition authorities that have practical achievements in the competition policy sphere.

On the one hand, the Antimonopoly Committee interacts with the specialized international organizations, such as: the Organization for Economic Cooperation and Development (OECD), the United Nations Conference on Trade and Development (UNCTAD), International Competition Network (ICN), the Interstate Council on Antimonopoly Policy of the countries-participants of the CIS, and, on the other hand, cooperates with competition agencies of other countries (Russia, Armenia, Azerbaijan, Georgia, Austria, Belarus, Bulgaria, Latvia, Lithuania, Poland, Slovakia, Hungary and the Czech Republic).

Building and developing a competitive culture in society is an important factor in improving the efficiency of the competition advocacy. All parts of a society – consumers, businesspeople, trade unions, educators, the legal community, government and regulatory officials and judges – should be addressed in this effort.

A competition culture is characterized by the attitudes of consumers and producers. A consumer attitude of easy surrender to monopolistic abuse of dominant positions and producers complacent with the status quo of their privileges are typical for a weak competition culture. On the other hand, consumers looking actively for better options and a producer attitude of working hard on providing more and cheaper options to the consumers are characteristic for a strong competition culture. Also the awareness of the economic agents about competition rules reinforces competition culture [2].

Success in building a competition culture in Ukraine has obvious benefits for enforcement: businesses will more readily comply voluntarily with the competition law; businesses and the public will more willingly co-operate with enforcement actions, by providing evidence and the like; and policy makers will more enthusiastically support the mission of the Antimonopoly Committee of Ukraine, in particular by giving more resources to it.

On the one hand, developing a competitive culture demonstrates the benefits of competition. Competition advocacy by agencies includes, as an important component, creating among economic agents and the public at large more familiarity with the benefits of competition and the role of competition law and policy. Vital to creating competition culture is an effective communication strategy, which serves to make competition policy more transparent and understandable.

Awareness of the benefits of competition is another important component to competition advocacy, which is not exclusively directed at public authorities and the legislative power but also at economic agents and the public at large. It comprises all efforts by competition authorities intended to make other government entities, the judicial system, economic agents and the public at large more familiar with the benefits of competition and with the role competition law and policy can play in promoting and protecting welfare enhancing competition. The tools that can be employed in the effort are generally well known, and include: publication of competition agency decisions, promulgation of enforcement guidelines, publication of pamphlets and information booklets for the general public, publication of annual reports, publication of market studies and of technical papers, regular communications with the press and electronic media, Internet web sites, speeches by senior enforcement officials, and seminars and conferences, including workshops for judges.

On the other hand, developing a competition culture includes fighting the enemies of competition authorities. Competition makes mostly an indirect, somewhat unseen contribution to economic welfare. In contrast, the competition authorities' opponents hire the most capable communicators to undermine the significance of competition policy. In this context, there are two reasons why communication is a vital and essential tool. First, a competition authority has to defend its very existence and has to demonstrate its indirect contribution to well-being. Secondly, a competition authority must defend itself against people who seek to distort or interfere with the positive message it is trying to convey.

The information about of interaction of Antimonopoly Committee of Ukraine with the public and the media in is represented in table 1 [3].

Table 1.

Interaction of Antimonopoly Committee of Ukraine with the Public and the Media in 2007-2010

№	Indicators	2007	2008	2009	2010
1.	The number of appearances in the media	4000	4900	6000	4800
2.	The number of performances on radio and TV	1600	1960	339	300
3.	The number of performances of AMC in printed media and Internet publications	460	230	361	3500
4.	The number of press interviews	17	20	34	22
5.	The number of public events conducted by the AMC with the participation of the media and the public	46	42	49	60

Table 2 shows the basic problems of competition policy in Ukraine, which have had repercussions in society.

Table 2.

The actively discussed problems of competition policy in Ukraine in 2008-2010

Year	Problems
2010	Activities of the Antimonopoly Committee of Ukraine in energy, transportation, advertising of medicinal drugs and biologically active additives, in the banking sector, the issue of providing economically grounded cost of roaming by mobile operators.
2009	Activities of the Antimonopoly Committee on the oil markets, the markets of medicines during epidemics of influenza, the cable TV markets, the sugar market, the problem of pricing on passenger public transportation in Kiev.
2008	Increasing prices for socially important goods, including medicines, petroleum products, urban transport services, tariffs for housing and utility services; actions of the "Volia-Cable" on the cable TV services market in Kyiv; the proposition of Antimonopoly Committee of Ukraine about the introduction of criminal responsibility for the most dangerous anti-competitive conspiracies.

To our opinion the further AMC's activities in the sphere of competition advocacy should include the following actions: development and adoption of Competition code; annual revision of the rules, norms, protective measures, regulations and instruments of competition policy, coordination of competition policy with other areas of economic policy; establishment of Expert Councils with the participation of business; stimulating the creation of legal departments in large companies, specializing in antitrust law; organization of seminars for practicing lawyers − experts on Antimonopoly legislation; conducting work among citizens through social networks and blogs through the publication of the most significant news and announcements.

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A.M.Kozub, Ph.D., N.O.Suvorova, S.V.Pron',
(National Aviation University, Ukraine)

OPTIMIZATION OF A SET OF SURVEILLANCE MEANS FOR GROUND AEROSPACE MONITORING IN AGRICULTURE AND FORESTRY

In this article we consider problem formulation of vector optimization of surveillance means set for aerospace monitoring of forests and lands for further practical determination of its solution methods. These methods are based either on many-alternatives variant selection or on special algorhythms. Conclusions about practical solution of a problem of rational set of surveillance means in agriculture and forestry have been done.

Nowadays, there is an active growth of aerospace industry in Ukraine [1, 2]. Ukrainian remote Earth sensing (RES) spacecraft Sich-2M was launched. It stipulated a necessity of formation of conceptual base for use of means of aerospace surveillance and iconic information processing for solution of problems of object's condition determination with strict requirements to efficiency of iconic information receiving, sending and processing. One of the most priority directions of such research in Ukraine is land monitoring (forest firefighting, phytosanitary monitoring, precise agriculture problem solution [3] and fighting with harmful objects) in forestry and agriculture. To reach the required aerospace monitoring performance indexes (providing high distinguishing capability, needed surveillance range, efficiency of iconic information receiving at the condition of economic costs minimization), arises an actual task to work out scientific approaches for complexing space and aviation surveillance means during aerospace monitoring of given objects. Herewith arises a necessity to substantiate a surveillance complex, optimal (rational) according to the set of different indexes of complexes sets. The carriers of these indexes can be spacecraft, airplanes, helicopters, unmanned air vehicles (UAVs), airships, free and attached aerostats, gliders, etc. [4].

Spacecraft (SC) RES are widely used for investigating natural resources of the Earth and solution the problems in meteorology and topography. For natural resources spacecraft mainly are equipped with opto-electronic or radar equipment. The advantages of the last on eare that radar equipment allows observing the Earth in any time of day and night, season, regardless of the atmosphere state.

Space filming of the Earth includes photos and registrograms of Earth's surface took from height not more than 100 km in any time of day and night from different air vehicles: aerospace systems, artificial Earth satellites, automatic orbital stations, manned SC.

Aerial photography is the filming of locality (height varies from hundreds of meters to 20km) that is held from flying vehicles via different filming devices. Nowadays light manned and unmanned air vehicles (UAVs) are widely used for sensing forests and farmlands.

Ukraine has possibility of using remote Earth sensing from the space in forestry and agriculture. This is aerial photography (space photography) or scanning of big areas for solution of problems of large-scale mapping of forests and lands and producing digital relief maps. These data are material base for the creation of geographic information systems (GIS) for control of areas that are necessary for investigation. Primary and secondary processing of such data give possibility to carry out a process of clustering of a space within a separate object, first of all in agroecological sense (to distinguish various areas with definite slopes and orientation in space for determination of their hydrology, insolation, etc.).

Remote sensing data can also be used in mapping for carrying out the technological operations including differentiated insertion of agrochemicals, chemical and biological means of plant protection, etc.

Application of an aerospace monitoring will help us to determine separate soil parameters more accurately, for example the dynamics of its humidity and temperature change, and some

climatic factors such as total temperatures, wind direction, content of mineral nutrition and others [5, 6, 7]. The processing of multispectral data allows us to detect the state of plants growth, harmful objects and to forecast the future situation development. Usage of crop capacity forecasting means allows us to work out the optimal integrated plant protection systems.

The quality of photos gained with the help of SC (fragmentation) in some cases is insufficient for their efficient use while solving the problems of environmental protection. This is stipulated first of all by the climatic and weather conditions. Besides, the efficiency of receiving space photos is insufficient for making timely decisions. That's why the scientists have a task to improve the methods of remote sensing to overcome the detected shortcomings.

Usage of UAVs together with aerospace monitoring can be considered as one of perspective ways of getting the information in the real-time mode, which is necessary for solving the given problem [7]. For these purposes air vehicles that are capable to work with necessary equipment for performing the monitoring and efficient receiving the information are used. Such apparatus are devoid of drawbacks that are inherent to space systems. They can fly at low heights (up to 30 m), they are not obscured with cloudiness, and the special permission (corridor) is not required for them. This permits to take photos of the concrete object with higher fragmentation of areas.

In order to expand the sphere of UAVs usage, further research of their construction's improvement and equipping with needed apparatus is necessary. During the tests of UAVs there were detected some drawbacks that have to be liquidated:

mechanic vibration influences the quality of the photos (further research of oscillation range and methods of their removal is needed);

stability of vehicle's flight depends on the wind's speed (it's necessary to amend the vehicles' construction with the aim of their stability improvement);

during the operation of flying vehicles it was found that for their take-off and landing a runway is needed (up to 100 m). Not all investigated areas had such runways, that's why the possibility of hand launching or launching from the catapult is considered;

there is a necessity of investigations concerning improving the accuracy of apparatus orientation in the space. It's necessary for improving the quality of the photos and the coordinates of scanned areas.

Besides aircraft type of UAVs recently helicopter type of UAVs usage have been started for environmental monitoring and getting the information about the state of investigated objects that is necessary for making optimal decisions. These vehicles have advantages over aircraft type of UAVs and can produce photos with higher quality. But they are more expensive.

It's worth noting, that selection of information use from aerospace surveillance means depends on concrete conditions of their use, nomenclature of indexes and necessary efficiency of data collection. Operational climatic data usually comes with the help of spacecrafts. Efficient multispectral filming with high resolution is made more often with the help of manned and unmanned air vehicles, particularly in regions with plenty of cloudy days.

It's worth noting that during the investigations the complex of means of airspace monitoring is rational to consider as a complex system of an organizational type. Then, the task of grounding the set of airspace surveillance means is a case of development of the theory of multicriteria (vector) resource optimization in the branch of decisions grounding concerning producing and control of complex systems of aerospace services providing.

The question of problem formulation of the tasks of vector optimization and estimation of the main quality indexes of the functioning of aerospace surveillance means is sufficiently considered and investigated in the scientific works [2, 4].

However, the results received, are not specified for solving the problems of optimization of a set of surveillance means of aerospace monitoring and grounding of the ways of their application. In particular, the problem of optimization considering the main indexes and functioning quality criteria of means of receiving, transition and processing of information in the conditions of limitations on time indexes of complicated objects monitoring systems is not formulated. The optimality criteria of set, main variables of the problem that significantly influence the chosen criteria, constraints on the

variables are not established. The interconnection between criteria, variables and constraints during the solving of the problem of optimization of a set of surveillance means is not established.

The solution of a task of vector optimization in practice of grounding the set of aerospace surveillance means aims to determine the optimal (rational) quantitative and qualitative composition of Earth remote sensing means, manned and unmanned air vehicles that provides the reaching of needed aerospace works' efficiency level according to the indexes "efficiency – cost – complexity of aerospace works performing". We should note that solving of the problem with such formulation has not only applicative character (optimization of aerospace works) but is essentially a base for working out the technology of aerospace monitoring organization.

The peculiarity of problem formulation is the complication of distribution optimization of heterogeneous means of aerospace surveillance by the economic criteria. In particular, on the one hand it's necessary to maximize the indexes of efficiency of problem solving by appointment (detection of monitoring objects), and on the other hand – to extremize the indexes that characterize the created complex of means as a distributed subsystem of information exchange and complexity of tasks' fulfillment during the provision of aerospace services.

Focusing on the fact that while applying the formed set of aerospace surveillance means, it's necessary to provide the required by the customer of aerospace services level of information provision (efficiency, multispectral range of filming, periodicity, cost, etc.) at the solving of such problems.

While optimizing the distribution of heterogeneous means of aerospace monitoring, it's rational to use the method of reduction of dimensions of a complex of criteria functions. Herewith, while applying the method of transferring of vector optimization indexes to the constraint range, mathematical interpretation of the problem can be concretized to 2-criteria problem of minimization of a function of such type:

$$S^{акм}_{олт}\left(З^{оес} Jn_j f\left(Q_{jzf}\right)\right)=\left\{\begin{array}{l} R^{акм}_{E_i}\left(Q_{jzf}\left(P^{об}_{інф_{заб}}\left(S^{акм}_i\right)\right)\right)=\sum\limits_{j=1}^{m}\sum\limits_{z=1}^{n_j}\sum\limits_{f=1}^{F} C_{jzf}\cdot Q_{jzf}\rightarrow \min \\ P_{свз}\left(Q_{jzf}\right)=\sum\limits_{j=1}^{m_{акм}}\left\langle a^{кз}_{jzf}\cdot Q^{кз}_{jzf}\left(Q_{jzf}\right)+a^{бпла}_{jzf}\cdot Q^{бпла}_{jzf}\left(Q_{jzf}\right)+\ldots\right. \\ \left.\ldots+a^{піл}_{jzf}\cdot Q^{піл}_{jzf}\left(Q_{jzf}\right)\right\rangle\rightarrow \min \end{array}\right\}; \quad (1)$$

where $R^{акм}_{E_i}$ is the resource economic costs that are connected with applying the i-th variant of a set of aerospace monitoring means during the work performing;
$P_{свз}\left(Q_{jzf}\right)$ is the complexity of objects monitoring tasks' fulfillment while applying the i-th variant of a set of means.

Considering that the expression for probability determination $P^{об}_{інф_{заб}}\ S^{акм}_i$ has the form

$$P^{об}_{інф_{заб}}\left(S^{акм}_i\right)=1-\frac{\sum\limits_{j=1}^{m}\sum\limits_{z=1}^{n_j}\sum\limits_{f=1}^{F}\left(1-\overline{P}^{coi}_{jzkf}\right)\cdot\left(1-\overline{P}^{викр}_{jzf}\right)}{Q_{jzf}}, \quad (2)$$

where $P^{об}_{інф_{заб}}\left(S^{акм}_i\right)$ is the probability of full performing of customer's information providing tasks about the condition of monitoring objects. Herewith, the complex of constraints with constraints on criteria functions' parameters (1) can be expressed in such form:

$$P^{y}_{вз_s}\left(S^{акм}_i\right)\geq P^{y}_{вз_s\ потр}, \quad (3)$$

$$P_i^{coi}\left(S_i^{акм}\right) \geq P_{потр}^{coi}, \tag{4}$$

$$\overline{P}_{fn_j}^{викр} \geq P_{потр}^{викр}, \tag{5}$$

$$D_i\left(S_i^{акм}\right) \geq D_{потр}, \tag{6}$$

$$P_{свв}^{акм} \geq P_{зад}^{акм}, \tag{7}$$

$$C_{jn_j f} \geq 0,\ f = 1,2,...,F \tag{8}$$

where $P_i^{coi}\left(S_i^{акм}\right)$, $P_{потр}^{coi}$ is a probability of timely receiving and processing of iconic information by the units of processing and analysis during the application of the i-th variant of a set of aerospace monitoring means and its minimal allowable value, respectively;

$P_{fn_j}^{викр}$ is a probability of detection of j-th kind of monitoring objects by the units of processing and analysis during the realization of i-th set of aerospace surveillance means and its minimal value, respectively;

$P_{свз}^{акм}$ is a probability of connectivity of a subsystem structure of aerospace monitoring.

The order of cost criteria function formation does not cause any difficulties. The formalization of a stability function can be carried out by the methodology [8]. Herewith while solving the problem of estimation of control stability of aerospace means it's necessary to consider the telecommunications network of the object monitoring system as an undirected graph G. The apexes of the graph G are the collection means and the points of information processing, and its edges – lines of information interchange between them. Hence, as it is shown in [8], the basic of structure's stability is a probability $P_{свз}^{акм}$ of connectivity between surveillance means and procession (control) points. Connectivity probability is essentially a probability of the fact that information about the object will be transmitted during the time $t \leq t_{зад}$ with the number of mistakes not more than preset [8].

Therefore the problem of grounding of rational set of aerospace monitoring means is essentially a vector inverse problem of optimal distribution of heterogeneous resource of aerospace monitoring means between the objects of surveillance with the aim of provision the necessary efficiency level of aerospace works performance.

Methodological foundations of vector optimization problems solving are sufficiently worked out in domestic and foreign literature [2, 9, 10]. Analysis of well-known methods of vector optimization by the type (1)…(8) problem solving has shown that for practical solving of the problem of grounding the rational set of aerospace monitoring means it's rational to choose the adaptive methods of decision-making [2, 10].

Hence, in the problem formulation (1)…(8), next stages need formalization while planning the aerospace works:

determination of the borders of the zone of "not worse variants" of rational means complex (Pareto zone);

determination of the scheme of compromises of the person who is making a decision (PMD);

normalization of partial efficiency criteria (3) and (4) of solving the aerospace monitoring problems and incorporation of their priorities.

The most complicated question is the formalization of the compromise scheme of the person who makes the decisions for the final choice of the rational variant of a set of means and structure of the aerospace monitoring subsystem from the plural of the so-called "not worse variants". Herewith, the function that models the compromises must adapt to the conditions of environment. One of the priority directions of further research of this issue is the implementation of nonlinear scheme of compromises concept.

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V.M. Marchenko, doctor of economics,
V.Perederiy, postgraduate
(National aviation university, Ukraine)

INFLUENCEOF THEWORLD GROWTH INAIR TRANSPORTATION AND RELATED PERSONNEL SHORTAGESON THEUKRAINIAN AIRLINES COMPETITIVENESS

Forecasts forthe aviation industrybasedon ICAO materials are analyzed. Possibleconsequencesfor Ukrainianairlinesaredefined and general recommendations are given.

Before the air transport industry crisis in 2008 and 2009, a situation very much orchestrated by unrelated collapses in global credit markets and skyrocketing fuel costs, the threat of a widening gap between available and required aviation personnel was seen as a potential traffic growth constraint in certain regions. The challenge for the industry today remains ensuring sufficient training capacities across industry sectors, States and regions, without compromising air transport's historically very high quality and safety standards.Until recently, pressures in this regard artificially appeared to be eased since the airline industry was – and to a large extent still is – recovering from the decline in traffic growth due to the global financial and economic crisis.. Difficulties may soon arise however, most notably when the additional demands for personnel, fuelled by projected traffic increases and fleet expansions, coincide with predicted retirement waves.Human resources development and management must therefore strive to continuously improve the competency levels of safety-critical personnel, while taking into account interdependencies for supply and demand of qualified personnel at national, regional and global levels. Estimating current and future requirements for civil aviation personnel and training capacity in each region is essential for human resources planning, institutional capacity building, and related funding and policy measures.

Aviation needs in aircrafts, pilots and other staff were analyzed. Aviation will require 207,600 new pilots by 2018; 352,900 by 2026. Maintenance personnel figures are even more dramatic, with the IATA Training and Qualification Initiative (ITQI) projections now indicating that 405,500 aircraft mechanics will be needed to fill new and existing positions as of 2018, and almost three quarters of a million (739,000) by 2026 (table 1) [1, p. 8].

Table 1

Predicted indicators of the aviation industry development

AIRCRAFT DEMAND	**2018**	**2026**
Total Aircraft	17,650	32,000
Additional Aircraft	12,355	21,000
PILOT AND TRAINING DEMAND	**2018**	**2026**
Total pilots needed to fly new aircraft	193,100	350,200
New pilots for additional aircraft	135,000	227,500
New pilots needed to fill the fluctuation andretirement gap	72,600	125,400
Total new pilots (additional aircraft and fluctuation) needing ab-initio training	207,600	352,900
Total new pilots needing transition training on replacement aircraft	57,930	122,700
MAINTENANCE DEMAND	**2018**	**2026**
Total mechanics needed for additional aircraft	247,100	420,000
Total mechanics including fluctuation and retirement	405,500	739,000

The ITQI figures are based on specific research applied only to pilots and maintenance

personnel, ICAO, IATA and a wide range of industry, education and human resources stakeholders have also drawn attention to the fact that additional aviation professions (controllers, managers, inspectors, technicians, etc.) will likely demonstrate similar vulnerabilities.

Main causes for the trends are identified. They are: demographic, social, sectoral and political factors. They include the increase in the median age of practitioners, the fact that many aviation skill sets are very desirable for, and transferable to, other industries, that sector needs can vary considerably depending on the States or Regions under consideration, and the reality that the 'wild blue yonder' is no longer as glamourous or exciting as it was once perceived by younger demographics.

It has also been highlighted that the particularly cyclical nature of air transport economics, with the commensurate hiring and layoff periods these produce, makes personnel attraction and retention more difficult.

Furthermore, non-harmonized government programmes can have a tendency to exacerbate wider industry recruitment issues and concerns.

It was seen that in aviation, that trend is even more pronounced than in other sectors given the very significant projected growth of the worldwide industry. Aircraft manufacturers are going to need to become very creative and diligent about how to assess and to re-purpose skill-sets between sectors, such as retraining automobile assembly-line painters to become certified aviation painters. There's also a great need for workers specializing in composites, such as those now being used in advanced aircraft like the Boeing Dreamliner or Airbus A-380. For example, industry needs a large number of composite specialists—today—and the global workforce cannot supply them. There is a need to put in place programs to migrate people with associated skill sets into this and other new focus areas of labour demand. The solution is going to require harmonized national and international programmes [1,2].

Further research should identify the perceptions of the next generation towards aviation professions based on Regional criteria, as well as highlighting any barriers now preventing the next generation to access aviation professions.It should be studied appropriate recruitment and training methods to respond to new attitudes, perceptions and learning styles reflected in today's youth markets.

It was studied the activities of major organizations in the aviation industry. Thus, to address thispotentially critical crisis to aviation operations, ICAO has launched the Next Generation Aviation Professionals (NGAP) initiative– building on and complimenting the work of the IATA Training and Qualification Initiative (ITQI) [1,2.3].

At those forum all participants agreed that a disconnect now exists between licensing requirements (ICAO Annex 1) and what is actually required by the industry to enter the cockpit. It was suggested the industry standards should be more transparent and a mechanism identified to more effectively correlate licensing and industry requirements. Concerns were also raised that, as the industry continues to grow, it becomes further constrained by the number of people available to do the job, leading to a decline in the skills considered acceptable when new personnel report for duty. Participants voiced opinions that simply defining minimum standards for licences has become insufficient. One potential solution is the introduction of a professional certification mechanism which would be non-disruptive to the licensing procedures while leveraging existing ISO processes. It was suggested such a mechanism could facilitate the transferability of competencies and support harmonization, and that it should be the responsibility of individual States. Some participants noted that bilateral agreements had already been introduced among States to facilitate the transfer of competencies, and that these may still prove to be the best means to achieve this objective [2].

Another area of general concern is the lack of formal training requirements for certain non-licensed aviation disciplines. It was suggested that consideration should be given to accreditation mechanisms for these disciplines whereby competency standards could be supported, and that associated accreditation criteria should be developed using industry input.

The essential need to recruit candidates that have the 'right stuff' was also highlighted. It was noted that failures to do so are costly in terms of training and have a negative impact on safety.The

next generation of skilled aviation workers requires training and education that engages them personally. This implies that ways of achieving competency standards should be flexible and varied to accommodate learning styles and modes of delivery. Skill assessment should be based on the competency that can be demonstrated rather than the institution or method by which the competency was obtained. This is reflected in the model that the academic world is now adopting, where the focus is on what is being learned rather than how it is being taught.

This tendencies can critically influence the Ukrainian airlines competitiveness. Lack of qualified staff can cause problems in all airline activities (from the quality of aircraft maintenance till operational effectiveness). As a result airline image could be completely destroyed. One of the most important reasons of qualified staff reduction for Ukrainian airlines is the differentcein salaries between domestic and foreign airlines.One of the cheapest and the fastest way to get needed personnel is to enticeit from others airlines (e.g. airlines from developing countries).

So, the most competitive would be the airlines, which would be able to grow and hold sufficient number of well trainedpersonnel. Ukrainian leading airlines have their own training schools and nowadays they are completelyequipped withstaff. But excludingcrisis years Ukrainian market is one of thefastest growingmarketsin Europe and according to ICAO's forecastsdemand for skilled aviation personnel will increase tremendously.

However, on the other side, it creates new opportunities for licensededucational institutionsin the field ofaviation. But there is a strong need in state interference. States need to support and better harmonize their sectoral training and certification programmes.

One of the best examples is Canada. Canada has established a range of 'sector councils', covering a wide variety of segments of the Canadian economy. Their purpose is to help their respective industries manage human resources issues, including the certification of individuals in relevant professions and trades, developing curricula, accrediting curricula offered by colleges and keeping track of, and adjusting to, new trends in Canadian aviation and aerospace labour markets.

In aviation sphere such establishment called Canadian Aviation Maintenance Council (CAMC). CAMC works with industry and the Canadian aviation training organizations (e.g. colleges) to develop standardized curricula which respond to industry needs [1, p. 6].

Conclusions.During the last decade, commercial air transport hasdemonstrated very strong traffic growth patterns, leading to the coming-to-market of many new aircraft operators and the highest number of aircraft orders ever registered.These tendencies may lead to respective personnel shortagesthat may negatively affect theukrainian airlinescompetitiveness. To avoid negative consequencesthereshouldbemade a number of measuresat nationallevel andfor individualairlines. Human resources development and management must therefore strive to continuously improve the competency levels of safety-critical personnel, while taking into account interdependencies for supply and demand of qualified personnel at national, regional and global levels. Estimating current and future requirements for civil aviation personnel and training capacity in each region is essential for human resources planning, institutional capacity building, and related funding and policy measures.

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S. Ramens'ka, Ph.D in economics
(National Aviation University, Ukraine)

CONDITIONS FOR DEVELOPMENT OF THE UKRAINIAN DOMESTIC AIR PASSENGER TRAFFIC MARKET

After a significantreductionintheglobalfinancial crisis Ukrainian market of air passenger traffic shows growth by increasing the volume of passenger traffic on international routes. Domestic airlines transportation is also characterized by positive dynamics, but the domestic transport market is not growing so rapidly. One of the factors promoting market growth of domestic traffic is the development of budget airlines.

Providing vital links and communication, air transport is an essential area of economic development. Functioning of airports of Ukraine belongs to the factors that shape the overall economic situation and the work of airlines.

Since the collapse of the USSR and due to the following protracted economic depression the movement measured in the quantity of carried passengers has morethan 12 times decreased in Ukrainian airports. Small regional airports and airfields were closed. The gradual economic recovery that began in 1999 increased international traffic and caused additional demand on existing airport facilities. Airports Development Programs are directed on increasing airports' capacity, improving service levels, updating passenger and freight terminals, construction of additional runways, hangars and warehouses, upgrade surface transportation equipment, equipment of air traffic, optimizing schedules takeoff and landing, as well as development of airports transport infrastructure.

Since May 2008, Ukraine has 43 civilian airports and flight zones, including 34 employed and 23 designated as international. 8 airports are considered strategic: Boryspil, Kyiv Zhulyany, Lviv, Donetsk, Kharkov, Odessa, Simferopol and Kiev, serving up to 90% of total passenger traffic (fig. 1).

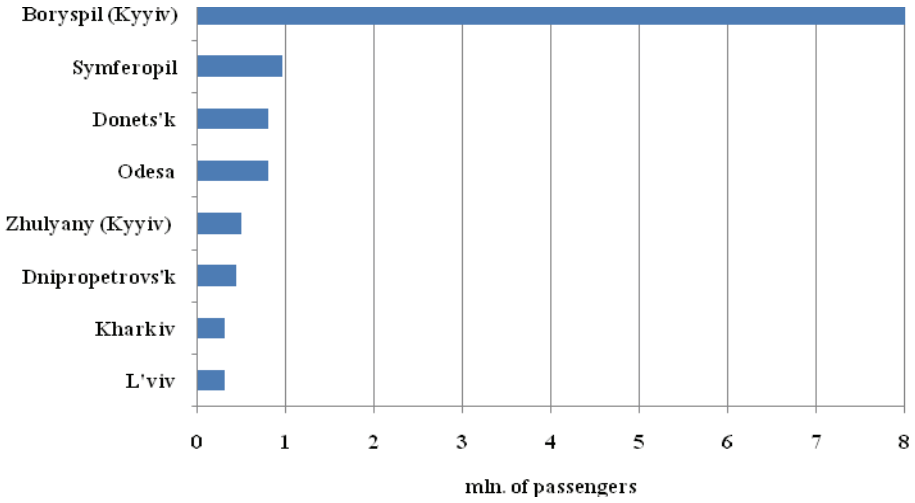

Fig.1. Passenger traffic by airports of Ukraine in 2011

Vinnitsa, Ivano-Frankivsk, Kirovohrad, Mykolaiv, Luhansk, Poltava, Rivne, Ishmael, Sumy, Ternopil, Uzhhorod, Kherson, Khmelnytsky, Cherkasy, Chernivtsi, Berdyansk, Mariupol, Kerch, Kerch, Sevastopol, Severodonetsk are considered as slightly developed airports.

In Ukraine there are airports or airport area used for aircraft operations, aircraft manufacturing, sport aviation, and so on. including Kyiv / Antonov, Djankov, Kharkiv / Sokolniki, White Chapel, BorodyankaVasilkov, Factory, Kremenchug, Lake/Zhitomir, Limanskaya, Svyatoshyn, Kyiv/Seagull/

Demand at the Ukrainian air transportation market shows a positive trend. In 2011 the airlines carried nearly 23% of passengers more than in 2010, but the share of domestic passenger traffic in the total volume is reduced, as shown in Fig. 2.

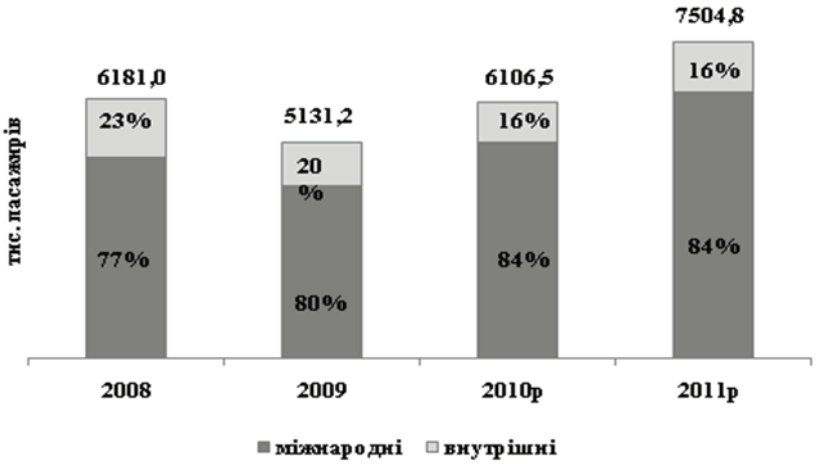

Fig. 2.Trend and structure of the air passenger transportation

The increase in domestic air transportation can be achieved through development of budget air transportation. One of the means for achieving significant results of expansion of budget air transportation is to study and overcome the problems that the external business environment puts forward.

In Ukraine a few attention is paid to the possible use of the budget airline for development of the domestic market, and with it, airport infrastructure. It becomes obvious for some domestic airlines that the functioning of the "lowcost" model is much more efficient both in terms of meeting the needs of the end consumers - passengers and creatinf value for the airline.

Budget airlines provide transportation on domestic and foreign markets. Domestic markets are usually balanced, so that there is demand from passengers for transportation in the west, east, south. However, we should not forget about the demand for budget air from a large number of Ukrainian citizens that live abroad and need comfortable and affordable air travel conditions to be able to come home more often.

Value for airlines and airports are obvious: this is increase of the number of flights. It is clear that any development project requires investment for implementation, so it is appropriate to combine the efforts of the state on technical improvement of airports and creation of efficient infrastructure with interested carriers, primarily national.

Under conditions of instability leading domestic airlines were able to keep and even strengthen its position in the Ukrainian airline market due to popular events such as the introduction of new forms of services and tariff system, promotional discounts. The volume of passenger traffic of the first Ukrainian "lowcost" company “WizzAir” rose almost 4 times. In 2011 commercial flights of domestic and foreign airlines were served by 28 Ukrainian airports and airfields of the available 43.

Ukraine is not the last in the rank of provision of population with airports, but the maximum share of passenger traffic accounted for airport Boryspil.

The passenger traffic in airports of Ukraine is could be increased by expanding domestic passenger traffic, than becomes possible with development of budget airlines which create a significant competition passenger conveyance by rail due to increase of the trafficratesbyUkrazaliznytsya.

Conclusion

Development of Domestic airlines using the “lowcost" model enables airlines to meet the demand from end-users of air transportation services - passengers, as well as create additional value for airlines.

Ukrainian air transportation market has a great potential, which, unfortunately, difficult to implement because of the problems that are imposed by external macro-and micro environment. Identification and examination factors that prevent from the development of Ukrainian market of budget air transportation, make it able to reduce their negative impact and achieve a significant development of domestic airports. The factors of negative influenceare the following:

– closure of the Ukrainian market. The closure of Ukrainian market due to lack of participation of Ukraine in the "Open Sky" project. External flights are made in the frame of international agreements that determine traffic volume and company, and sometimes even aircraft for the flights. At the same time the EU commercial companies decide themselves where and how to fly, guided only by economic expediency and the ability to negotiate with airports;

– impact of certain business structures on existing airports. Largely market for domestic air transportation depends on the policy of airports owned by the relevant airlines that limit for competitors the access to their territory;

– technical condition of airports. Only 8 airports in Ukraine are considered as strategic. Airports that technically unable to receivethemodernplanepreventthedevelopmentofinteriorair transportation market.

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T.A. Akimova, O.M. Namayeshi
(National Aviation University, Ukraine)

SIGNIFICANCE OF AIR ALLIANCES FOR AIRLINE INDUSTRY DEVELOPMENT

The following article defines the term air alliance, presents distribution of major airlines into alliances, suggests the reasons why airlines enter alliances, provides benefits and drawbacks of airlines in alliances and explains why Ukrainian airlines should join alliances and/or create the new ones.

The reasons for emergence of air alliances and problems with their development in market economy were determined by Rigas Doganis, Kostas Iatrou, Mauro Oretti, etc. These issues have not been discussed so widely in Ukraine as the air industry is quite young and is developing.

The overall objective of the study is to define the importance of joining air alliances by national carriers through analyzing the benefits and drawbacks of such alliances and the world practice.

Alliances have become a key feature in many sectors of the economy and especially in the airline industry [1]. At the end of the 20th century, American airlines started to adjust their marketing policy to the changing market reality by focusing on a single hub and abandoning secondary and tertiary hubs that were money-losing markets. In other attempts to consolidate and maximize profits, airlines made alliances with European airlines. For example, Continental and Delta announced such an affiliation with Air France, and American Airways proposed one with British Airways.

Since the 1990s, "the general consensus is that if an airline does not join an alliance it will be operating under a serious handicap" [6].

The biggest airlines, like British Airways, United Airlines, American Airlines, Lufthansa and Air France consider strategic airline alliances as the central element of their development. Airlines are capital-intensive. Few businesses have so many challenges. Airlines are fossil fuel dependent, operations are labor intensive and subject to government control and political influence. The airline industry is weather-dependent.

Before defining the efficiency of air alliances we should understand the meaning of the term “air alliance”. According to Air Transport Director of ICAO, there is no formal definition of air alliance because “the nature of alliances varies so widely”. However, a number of researchers suggest their view of the issue.

Oum, Taylor, and Zhang state that “a global airline network formed by a group of affiliated airlines which offer seamless services to consumers through a joint use of computer reservation systems, through fares and ticketing, automatic baggage transfer, coordinated flight schedules, code-sharing of flights, joint marketing, sharing of a frequent flyer program, etc.” [4].

Kostas Iatrou and Mauro Oretti infer that “a strategic airline alliance is a long term partnership of two or more firms who attempt to enhance collectively vis-à-vis their competitors by sharing scarce resources including brand assets and market access capability, enhancing service quality, and thereby improving profitability (…) A strategic alliance is one involving strategic commitment by top management to link up a substantial part of their respective route networks as well as collaborating on some key areas of airline business” [5].

All of the aforementioned definitions regard the concept of alliances from a different perspective. Therefore, we can make generalizations and offer our own understanding of the notion.

An alliance is a voluntary agreement between a group of airlines which act homogeniously in order to achieve a common goal of dominating the market of air transportation.

Air alliances form as a result of harsh competition between major airlines which have strong positions at their markets. Thereby flag-carriers of Europe (Lufthansa, Air France, British Airways) and USA (United Airlines, Delta Air Lines, American Airlines) joined three alliances to compete at a higher strategic level. This distribution of airlines is represented in Table 1 below.

Table 1

Distribution of major airlines of USA and Europe into alliances

Market	Star Alliance	Oneworld	SkyTeam
North America	United Airlines Air Canada	Delta Air Lines	American Airlines Canadian Airlines
Europe	Lufthansa	Air France	British Airways
Asia	Thai Airways International	Korean Air	Cathay Pacific
Latin America		Aeromexico	
Australia			Quantas Airways

On May 14, 1997, a group of five world-class airlines got together to create something never seen before, a Star Alliance that brings together networks, lounge access, check-in services, ticketing and dozens of other services to improve the travel experience of customers. A couple of years later two more global alliances appeared such as SkyTeam, which is the second largest airline alliance in the world, and Oneworld, was named the World's Leading Airline Alliance for the seventh year running (2009).

These three alliances together account for 67 percent of global revenue passenger kilometers (RPKs) reported by the International Air Transport Association (IATA).

Table 2

Economical and physical indicators of the world's major air alliances

Alliance	Star Alliance	Oneworld	SkyTeam
Load factor	73.7%	76.2%	79.2%
Total revenue (US$M)	119,286	90,713	92,842
Net profit (US$M)	3,374	2,367	-7,734
Passengers per year (MM)	413	320	373
Fleet size	3,993	2,280	2,971 (member airlines and their susidiaries), (+1,255 from related carriers)
Destination airports	1,077	727	905
Destination countries	175	142	169

As seen from Table 2, the leader in destination airports and destination countries is Star Alliance. It also has the biggest fleet size, total revenue and the number of passengers per year. Star Alliance has the biggest number of member countries. But at the same time Star Alliance has the lowest load factor. The largest load factor is pertaining to SkyTeam. Despite all this SkyTeam does not get net profit, it has only losses. Having analyzed the above facts, we can assert that Oneworld has the most stable position.

As the result, an airline which becomes the member of one among such successful air alliances also acquires an impressive status and easily adapt to market change, growth and the demands of competition. Actually, the majority of airlines is, or is trying to become, members of international strategic airline alliances because the efficiency of them is proved by a number of facts:

- enhancing of product development;
- creating new businesses;
- increasing exports;
- gaining access to the market;
- increasing competitiveness in domestic and/or global markets;
- diversification;
- achieving advantages of scope, scale and speed.

Having considered the facts that prove the efficiency of air alliances, the company should

determine the advantages or disadvantages of joining the alliance.

Allies can learn a lot of information from each other carrying out general research, exchanging now-how and studying production processes of each other. Outsiders often use alliances to answer a local legislation about national belonging of firm, and allies can jointly use a dealer network and distribution network, this way fastening the access to the user. In addition, alliances affect competition. They can compensate for the weak moments in competition, as well as propose a real mechanism of competitive activity.

Alliances have many deficiencies. The independent airlines usually have different motivation and, possibly, contradictory aims. That is why an effective co-ordination between companies is a difficult task.

Table 3

The summary of positive and negative effects for airlines when joining the alliance

Positive effects	1. Increase of cost (to efficiency). 2. Increase of innovations and knowledge. 3. Increase of flexibility and scale of activity. 4. Maintenance and strengthening of competitive edges. 5. Conquering new regions or distribute flights which have less demand. 6. Form a network of supply users, which stabilizes demand. 7. Fixed and operating cost cutting. 8. Creation of new types of profits. 9. Access to the foreign markets with minimum charges (without additional charges on equipment, license acquisition on flights).
Negative effects	1. Sharing new ideas which can affect competition between ex-allies in future. 2. Conflicts of interests. 3. Loss of marketing individuality.

An alliance influences not only the member airlines but the passengers as well. Normally, the effect is positive. The travel time reduces due to minimization of delays, cutting of waiting time at many airports, improved customer check-in and seamless connections with single check-in. Global ticketing, tickets interchange by airline allies, and lower cost of tickets make air travel with air alliances more attractive for customers. Finally, the passengers make use of more efficient service rendered by airlines which have joined an air alliance when compared to independent airlines. In particular, the customers enjoy exceptional flexibility in planning their itinerary, utilize the most comfortable flights and the most advanced accommodation and communication services.

In highly competitive market of air transportation the only one way for airlines to save their strong positions is to join air alliances. As Ukrainian air travel industry is developing, the major carriers only now start to join alliances.

At the beginning of 2007, “Aerosvit” and “Donbassaero” announced creation of Strategic Alliance “Ukrainian Aviation Group”. One of the main tasks of the alliance was to increase the competitiveness of both carriers and, consequently, of the national air transportation industry. When the alliance was formed, “Aerosvit” and “Donbassaero” developed a common route network, fleet was united and a new schedule of flights was created. The carriers increased the number of connections and formed new passenger flows via Kiev Boryspil and Donetsk airports. There are also negotiations concerning the possibility of “MAU” joining the SkyTeam.

To conclude, the last 20 years showed that air alliances have become an indispensable part at the transportation market. They play an important role in development of airlines. They allow an airline save its competitiveness in the harsh conditions. Certainly, not all airlines can join alliances and, even if they manage to do this, they will not immediately profit. Sky Team can be a good example of such effect. Nevertheless, we think that an alliance can be a great leap for national airlines in their development. The world’s major flag-carriers’ experience can help the Ukrainian air transportation market to expand. Joining air alliances and/or creating the new ones will help Ukrainian airlines compete with the leaders of the global airline industry.

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S.V.Kovalchuk (Khmelnytsky National University. Ukraine)
V.A.Mayevskiy (National Aviation University, Ukraine)

MARKETING OF RELATIONS ON INDUSTRIAL MARKETS: THE COMPANY FORMATION OF INTEREST IN ORGANIZATION OF INTEGRATED RELATIONS WITH SUPPLIERS IN THE PURCHASE PROCESS

The article studies the theoretical aspects of managing the relations in the supply chain of industrial companies and analyzes the significant for home companies fields of managing the supply chains and factors, that favor the establishment of integrated relations between companies.

Problem setting: Certain enterprises have always tried to optimize their position by organizing the relations with their suppliers in such a way to get the maximum benefit for themselves, including the minimization of their own spending. The relations between the companies in the process of purchasing the goods and other resources have different forms: from dual relations on competitive basis in the group of suppliers to integration of supplier into the chain of company supplies. The primary interest in purchasing organization in the supply chains can be explained by the desire of companies for minimization of expenses and maximization of benefits while promoting the material flow during all its length. The traditional, transactional, approach to the purchase, when the format of relations took the form of maximal force pressure onto the suppliers, aimed at getting the best purchasing prices and conditions quality, does not allow to enable all suppliers' resources, get the benefits from cooperation [1]. Moreover, the additional transactional expenses need to minimize the risks in the supply chains.

Facing the problems, which are caused by present conditions of competitive activity, enterprises inevitably come to a conclusion, that it is not enough to manage their own business only . It is necessary to widen the sphere of management and get real key factors of control and management of the activity of partners, that is to spread your own influence onto to chain of suppliers. Organization of relations with suppliers allow to move the purchase process on qualitatively new level, when benefits are got by two participants with the help of synergy and interrelations aimed at maximal benefit for not only participant of the deal, but for the chain in general. The necessity of work with final consumers on a new scheme brought to the transformation of traditional channels of distribution to vertical marketing systems. The basic difference is in the fact that, if in traditional channel all the participants worked separately, trying to provide themselves with the maximal profit (sometimes, to the prejudice of partners), the participants of vertical marketing system acted as one organism, increasing their profitability by means of coordination and uniting the efforts.

Marketing of relations. The reasons, which induce the companies to take part in integrated of supply chains are analyzed in details. At the same time, the questions, whether personnel of a company is ready for actions, which are connected with integration with other companies in the process of supplies have not enough researched yet.

Analyses of scientific sources. The research of relations between companies in the process of supplies was done in detail on the example of industrial markets. The company can manage the suppliers by means of organization of "optimal flow of high quality materials and components at the best prices from suitable group of innovation suppliers" [3]. The development of new methods of management in the supply chains promotes finding the key to solve the task of minimization of combined costs and transactional expenses in the whole totality of companies in the supply chain.

Both the suppliers and producers can benefit from successful partner relations, which may radically change business relations and create new values, which are impossible in the system "seller- customer"[4]. The suppliers by means of participation in the processes of designing new product and improving the quality, participation in decreasing the producer's expenses, optimization of logistics, influence the work of producer substantially [2].

Examining the conditions of formation of partner relations between companies, other researchers, e.g. K.A.Venetis and P.N.Gauri [5], say that maintaining long-term relations aimed at decreasing transactional expenses is important factor, but not the only and the main one, which urges the companies to form long-term relations. Authors determined the following aspects as the most significant ones: the service quality, trust, side effects of switching over to the other partner. In spite of the fact that these studies were done on the example of service businesses, these factors can be applied to the formation of relations in industry, which is proved by other studies. The studies of Morgan and Hunt [6] prove economic significant of trust, which is determined as the confidence of a company in the fact that other side will make the actions which will result in positive things for the company or will not act unexpectedly harmful for the company.

It cannot be taken into consideration that the service quality not only helps the consumer to reduce his expenses, but also stimulates the intention to make repeated deals and the readiness to pay more [7].

Some researchers (F.Lemk and others) underline that such tasks as quality, price, and delivery quickness gradually stop being perceived as distinctive qualities of partner relations [8]. Authors think that this happens because all suppliers, regardless of their status, must maintain this obligatory demands level, which becomes standard.

To the listed below factors the reasons, which caused the intention of industrial enterprises to the development of relations of a new type according to S.Kushch can be added:

- the tendencies for complication of inter- firm relations,
- clear tendency of companies transferring from vertical integration to more flexible forms of management organization [9].

In a number of factors there should also be mentioned the relations of dependability, which result in increasing the relation length. The relations of dependability appear when the customer cannot switch over to the other supplier without considerable expenses, and when the relations of property between the economic players exist, and when the customer is forced to relations. If the client needs to maintain the dependent relations with supplier, the relations are expected to be prolonged. In such a way, two conclusions should be made, first can be formulated in the following way: the length of relations between companies in the supply chain gives them additional advantages, but the fact of the relations length itself must stimulate the companies to integration into the supply chain. The second conclusion: both purchaser and supplier are interested in long interrelations, and each side is encouraged to this.

Foregoing factors condition the prerequisites, which form the interest of managers for supply chains, but distributing the practice of building supply chains needs appropriate instruments. That is why authors considers that mentioned factors in the works of D.Bowersocks and D.Kloss [10], which promote the development of practice of formation of supply chains, should be divided into two formats: those, that cause the need, and those that promote this needed implementation.

The aim of the article. The aim of the article is to determine the theoretical prerequisites and work out practical recommendations for formation the partner relations in supply chains on basis of generalization of stimulating reasons, which encourage companies to manage supply chains on the example of industrial enterprises of Ukraine in 2009-2011.

Base line exposition.

In previous researches [11] of the author there were elicited the sectors, the companies in which are inclined for integration of their suppliers (table 1). Among them there should be mentioned building, food and machine-building industries, pharmaceutical and some branches of heavy equipment industry and chemistry.

Cooperation of companies in the process of supply of material sources, that is expressed in the format of integration of supplier with customer, has stimulating reasons, which can be divided into objectively retractable in certain business- environment, and subjective, which depends on personal experience and knowledge of managers of companies- participants of supply chain, on their perception of aims and tasks of their companies in the process of promotion of material flow to final consumer.

Table 1

Classification of industry branches according to the results of assessment of tendencies for integration in supply chain.

Groups of industry branches	Company share of companies integrated into supply chain	Fields that meet the group parameters
Third group, that has medium tendency for management supply chains	0,71	Transport facilities and their maintenance Pipe production Takeaway food supply Coke production Building (precast concrete and ferroconcrete items production) Dry construction mixture production General construction
Fourth group that has an active tendency for management of supply chains	0,93	Production of plastic equipment for construction Machine building (transport equipment production) Pharmaceutical equipment production Production of piston engines of internal combustion and details for them (without repairs) Automobile equipment production Ferroalloy production Production and distribution of electricity

Objective factors, that encourage building such supply chains, are as following: development of marketing strategies by companies, catering for customer.

The second group of factors are: development of new organization forms, which are better oriented on the process under the conditions of globalization of economy.

The third group contains: revolutionary changes in information and communication technologies. Cooperation inside logistic systems demands mutual interfaces, functioning of which depends of information technologies, which appeared as a result of information revolution.

In the fourth group there are such factor as: logistic strategies implementation into practice, strategies that are based on integration of economic and ecological factors, with a glance of conditions that become more and more necessary for resources provision.

The fifth group contains: development of instruments of optimization of logistic processes and management.

The sixth group of factors is: development of production management.

Subjective factors can either intensify the intention of company to integrate in supply chains or take it away from participation in similar processes.

To assess the readiness of personnel for developing technologies of cooperation in supply chain there was held a research of dependability of parameters, which describe age, educational level of the personnel of supply department and their experience in comparison with the degree of involvement the company into integrated relations with their partners.

Such problems were researched: the interaction between appropriate types of relations with suppliers and such factors as : a) the personnel age, b) work experience- the length of service in the supply department, c) education, d) including: whether the personnel got specialized education, e) or when personnel got education and the place of study, f) training/retraining. The analysis was done in 66 companies of Ukraine.

The most significant factor, which is closely connected with the factor of company entry into

manageable supply chains, is the personnel age (table 2). In a supply department with medium personnel age more than 48 years old there wasn't recorded any case of development of integrated relations with suppliers/ customers.

Table 2

Dependability of participation of a company in integrated supply chains on the age of supply department personnel

Personnel age	Percentage of companies, that take part in integrated supply chain
Less than 27 years old	57,1%
28-31 years old	62,5%
32-35 years old	40,0%
36-39 years old	50,0%
40-43 years old	60,0%
44-47 years old	63,6%
48-51 years old	0,0%
More than 52	0,0%

Second most significant factor is the length of work of the staff: the most productive is the length of work of 7-8 years in supply field, and also 5-6 and 9-10 years. When the length of work declines from the medium 9 years in supply field, the number of companies decrease (table 3).

Table 3

Dependability of company participation in integrated supply chains on the length of work of supply service staff

Length of work of personnel in supply field	Percentage of companies, that participate in integrated supply chain
Up to 3 years	41,7%
3-4 years	41,2%
5-6 years	66,7%
7-8 years	80,0%
9-10 years	66,7%
11-12 years	57,1%
13-14 years	0,0%
More than 15 years	42,9%

The personnel education has the significant influence onto the level of participation of companies in manageable supply chains (table 4). The less is the share of the personnel with higher education, the more rarely such company implements new approaches to the organization of interaction with suppliers.

Table 4

Dependability of participation of companies in integrated supply chains on the education of supply service personnel.

Percentage of personnel with higher education	Percentage of companies that participate in integrated supply chains
Up to 50%	33,3%
50-59%	40,0%
60-69%	25,0%
70-79%	66,7%
80-89%	60,0%
99-99%	100%
100%	47,7%

Not less significant is the fact of getting business education: if the personnel studied additionally, the share of the companies, that manage their supply chains, increased in 2,17 times.

The assumption that getting specialized education and time and place of receiving education

(home or foreign) influence the personnel readiness was not proved.

Conclusions

If the company intends to apply the described in the article methods of management to supplier/ customer, for the success of this strategy it is necessary to assess really the perspectives of its realization and choose consciously the methods of implementation, for which it is necessary to monitor the partner readiness. While assessing the readiness of company- partner for integration the potential readiness of its personnel for this relations format should be assessed as well. The necessity to work with suppliers according to new scheme of interaction is seen by the personnel as useful strategy for business in case of receiving high level of education and further retraining on condition that personnel has the length of work from 5 to 10 years in the supply department and the age up to 48. If the personnel do not satisfy these conditions, the success of chosen format of building the interaction becomes questionable and it is necessary to look for specific approaches for their realization.

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Shcherbyna A., assist. (NAU, Ukraine)

SPECIFICATION OF AERONAUTICAL INFORMATION AND ITS CLASSIFICATION

The article investigates the peculiarity of information security and aeronautical information, its classification. Keywords, security, information security, aeronautical information, air transport enterprise.

Of particular importance for the economic security of airline information becomes part of that is because that is a very significant flow of information (data) necessary to ensure safety, regularity and efficiency of international aviation. The role and importance of aeronautical information has changed due to the introduction of area navigation (RNAV), based on the characteristics of on-board navigation systems and automated systems of data transmission (PBN). Distortion or erroneous aeronautical information could adversely affect the safety of airlines.

Information Security - is this state of protection of vital interests of individuals, society and the state in which minimized damage through incomplete, untimely and inaccurate information due to the influence of negative information, negative effects of operation of information technology, as well as unauthorized distribution. Information security in terms of economic interests now has a special relevance and is regarded as one of the priority tasks of strategic management. Information space and its information content should be attributed to the major enterprise resource that can bring significant income.

Effective information provision is essential for the concept of economic security and ensure effective strategic management.

One of the objectives of the enterprise information security is to prevent use of its information environment for the dissemination of false or misleading information about the processes that occur in the environment and to collect strategically important to the competitors about its internal environment.

However, please note that the information threat, because of systematic totality of threats increases the danger of internal and external threats. This is due to the influence of a large number of factors in decision-making processes at all stages of development and implementation of strategies that have informational character. Therefore, effective information and analytical support economic activity provides an overall analysis and processing of all the completeness of the data both in terms of competence of individual functional departments, and in terms of issues relating to general corporate policy.

Because of the complexity of the analytical process, the importance of the issues of coordination of interaction between different divisions in the process of work on analyzing and processing information. The system of economic security must recognize the impact the information, analyze the information and to protect it form a management system to respond to the actions of the environment. To successfully solve this problem it is necessary to organize effective work in gathering all kinds of information that is relevant to the enterprise.

It is important to classify all information obtained in order of importance for the economic security of the enterprise.

For this purpose the systematic classification of information, which is based on four levels of importance: 1. It is vitally important - essential information, its presence is necessary for the functioning of the enterprise. Leakage of this information endangers the functioning of it (the company) 2. Important - The information process consequences of leakage which causes damage to the company, but it can function effectively and in case of leaks, and 3. Good - information leak which causes damage to the company and does not affect its operation;

4. Insignificant - information leak which is causing material damage and does not affect its operation.

Because scientific sources is not enough consideration given to the issue of aviation

information, with dignity of ICAO Document 4444 number "of air traffic" and amendments to the Convention Chyhazkoyi number 15 "Aeronautical Information Services" offered the following generalized classification of this kind of information:

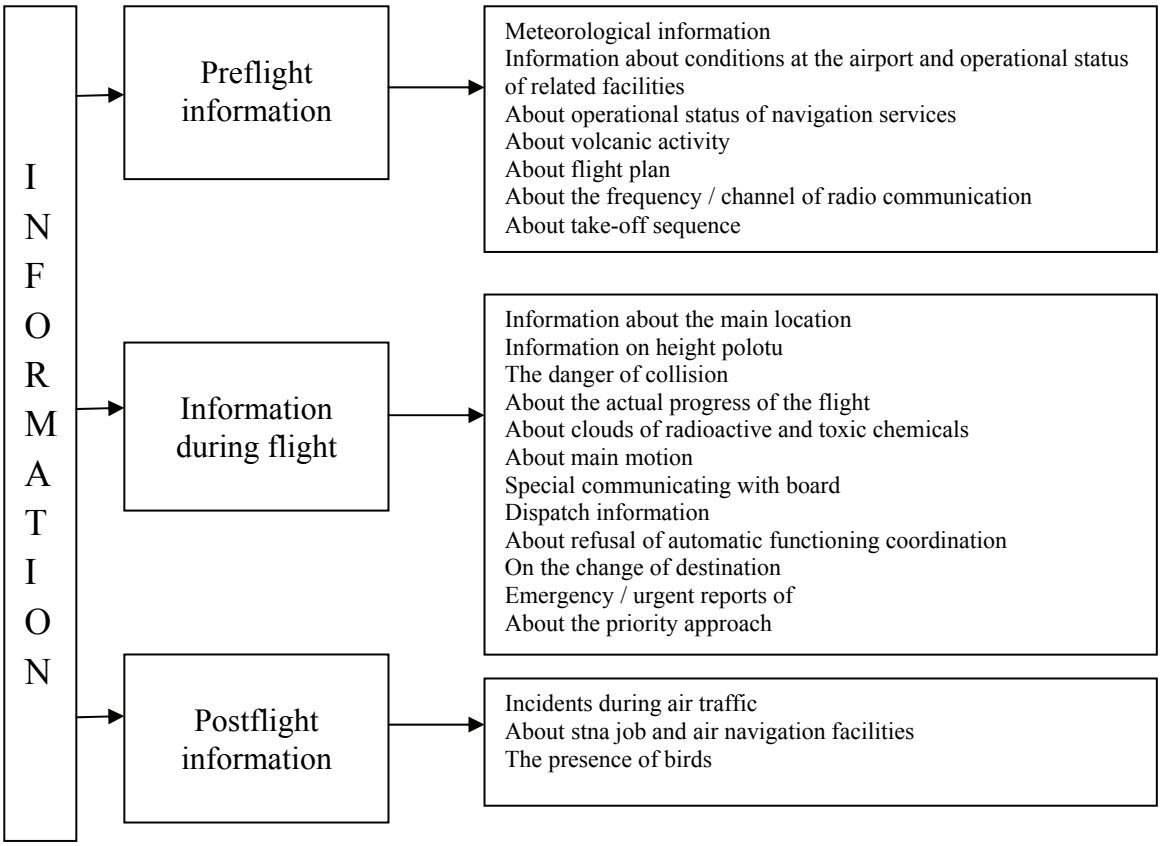

Figure1. A generalized classification of aeronautical information by time limits

At any aerodrome / heliport normally used for international flights, personnel associated with flight operations, including flight crews and services responsible for pre-flight information is available aeronautical information necessary for the safety, regularity and efficiency of air navigation and steps regarding routes, starting from the aerodrome / heliport. Aeronautical information provided for pre-planning of aerodromes / heliports includes:

a) The elements of Integrated Aeronautical Information Package,

b) maps and charts.

Extra current information relating to the aerodrome of departure and relating to:

a) the construction or repair work that carried on the maneuvering area or in close proximity to it;

b) bumps on any parts of the maneuvering area (as designated and non designated)

c) the presence and depth of snow, ice or water on runways and taxiways and their effect on braking performance;

d) the presence of snow drifts and accumulations of snow on the runways and taxiways, or in close proximity to them;

e) the presence of parked aircraft or other objects on the taxiway or in close proximity to them;

f) the availability of other temporary hazards;

g) the presence of birds that pose a potential hazard to aircraft operations;

h) failure, or irregularity in the work of part or all of the airfield lighting system, including approach lighting, entrance lights, runway lights, taxiway lights, obstructing lights, lights, indicating the unusable area on the maneuvering area and the source of power supply terminal;

i) failure, irregular operation and changes in the operational status of the SSR, ADS-B, ADS-C, CPDLC, D-ATIS, D-VOLMET, navigation services, mobile VHF channels aviation services, system monitoring Runway Visual Range (RVR), and an auxiliary source of power supply,

j) the presence and activities of the missions of humanitarian assistance, such as through the United Nations, with an indication of any applicable in this context, appropriate procedures and / or restrictions. Flight crew members provided brief summary of current NOTAM and other information in the form of an urgent nature composed in plain text newsletters pre-flight information (RIV).

States shall take measures to get at aerodromes / heliports information from the flight crew members on the status and operation of air navigation facilities or services, and provide this information to provide aeronautical information service for its subsequent distribution according to need. States shall take measures to get at aerodromes / heliports information from the flight crew about the presence of birds and provide this information to provide aeronautical information service for its subsequent distribution according to need.

For more detailed specifications classified information consider its contents according to the table. 1.

Table 1

The type of information and its main contents

Type of the information	Content of the information
Meteorological information	Aviation Weather Information is operational meteorological information (OPMET), including the WAFS forecasts of wind, humidity and air temperature and significant weather, as well as alphanumeric messages. Alphanumeric messages include advisory information on tropical cyclones and volcanic ash, regular meteorological aerodrome reports (METAR), special aerodrome meteorological reports (SPECI), special air-reports (AIREP), aerodrome forecasts (TAF), area forecasts GAMET , the projections on the route (ROFOR), as well as information SIGMET and AIRMET. Meteorological information is necessary to operators and flight crew members to: a) pre-flight planning by operators; b) re-planning by operators during the flight using a system of centralized management flight; c) the use of flight crew members before departure; d) the use of flight crew of aircraft in flight.
Information about conditions at the airport and operational status of related facilities	Information required for the safety of aircraft and relating to the movement area or any vehicles and equipment that are usually associated with it. Important information about conditions at the airport include information concerning: a) the construction or repair work on the movement area or in close proximity to it; b) rough or broken parts on the surface of the runway, taxiway and apron, whether marked or not c) snow, slush or ice on the runway, taxiway and apron; d) of water on the runway, taxiway and apron; e) snow drifts and drifts near the runway, taxiway and apron; f) other temporary hazards, including parked aircraft, or birds on the ground or in the air; g) failure or unstable operation of part or all of the airfield lighting system; h) any other relevant information. This information is provided sufficiently in advance to ensure that the aircraft could use it properly, and danger are indicated as precisely as possible.
About operational status of navigation services	ATS is constantly supplied with current information about the operational status of radio navigation and visual tools that are essential for the operation of takeoff, takeoff, approach and landing within their area of responsibility, as well as those of radio navigation services and visual aids are necessary to ensure land movement.
About volcanic activity	Information on volcanic activity, pre-eruption, volcanic eruptions, and information on volcanic ash clouds (clouds and the location of the affected flight levels) is transmitted to aircraft by the use of one or more methods defined on the basis of regional air navigation agreements. Special air-reports, including monitoring of volcanic activity, shall be made in writing, using special forms for such reports. Flight crews operating flights on routes that could be affected by clouds of volcanic ash, are provided with paper that is printed on the basis of a model form for a special air-reports of volcanic activity
About flight plan	For information about the intended flight or portions of the aircraft provided prior to departure for air traffic control authority. In many countries, the flight plan is required only when flying on instrument flight rules, but it is recommended to be filled, and when flying by visual flight rules. The flight plan is filled by a particular

	form as the form, and contains the following information: Designation of the aircraft, the registration of aircraft, flight rules and aircraft type, number and type (s) of aircraft wake turbulence category, equipment, aerodrome of departure, estimated time, cruising speed, cruising level, the route of flight, airport arrival, the total estimated time of flight alternate aerodromes, fuel capacity, the total number of persons on board, emergency and rescue equipment, other information.
About take-off sequence	Інформація, що містить дані про те, в якій саме черговості будуть злітати літаки.
Information about the main location	ATC, which provides services to aircraft ADS-C, checks the information on the ADS-C position in three dimensions, obtained from the aircraft, based on pilot reports and / or the results of monitoring compliance with the flight plan. In the event that the displayed location data beyond the approved tolerances, or after the test revealed that the difference exceeds the approved tolerances, the pilot informed of this and he is instructed to check on-board navigation system.
Information on altitude	In RVSM airspace tolerance value used to determine that the displayed information about the dispatcher the flight altitude, obtained from data on barometric altitude is accurate within ± 60m (± 200 ft). The other airspace, it is ± 90 m (± 300 ft), except in cases where the appropriate ATS authority may set a lower value, but not less than ± 60 m (± 200 ft) if it is deemed more appropriate. Check information about the flight altitude, obtained from data on barometric altitude, and output to the display controller is carried out at least once each ATC unit, equipped with appropriate equipment, the initial connection setup with the relevant aircraft or if it is not possible, as soon as possible thereafter. Testing is carried out by simultaneous comparison with the data on flight altitude on altimeter readings, obtained via radio communication from the aircraft. If the displayed information about the flight altitude is outside the established acceptable values or during the audit revealed the discrepancy greater than the specified allowable values, the pilot put to notify and he is instructed to check the pressure setting and confirm the altitude of the aircraft.
The danger of collision	In the case where it is observed that opoznannye aircraft performing controlled flight, it should be on a trajectory leading to the emergence of conflict between the aircraft and unknown aircraft, which may create a risk of collision, the pilot of the aircraft performing controlled flight at all Where feasible: a) be informed of an unknown aircraft, and on-demand aircraft making a controlled flight, or when, according to the manager, this situation requires it, to be proposed actions to prevent collisions; b) shall be notified on the Elimination of conflict.
About clouds of radioactive and toxic chemicals	Information on air emissions of radioactive materials and toxic chemicals that can affect the airspace that is in the service area of the ATS unit is transmitted to aircraft by the use of one or more ways
Special communicating with board	Special air-reports are made by all aircraft when there are or there are the following: a) severe turbulence, or b) severe icing, or c) a strong mountain wave, or d) thunderstorms, without hail, hidden in the clouds, embedded, widespread or with squalls or e) thunderstorms with hail, hidden in the clouds, embedded, widespread or with squalls, or f) a strong dust storm or heavy sandstorm, or g) a cloud of volcanic ash, or h) volcanic activity prior to the eruption or volcanic eruption. Also, when flying at transonic and supersonic speeds: i) moderate turbulence, or j) degrees, or k) cumulonimbus clouds.
Emergency / urgent reports of	To report that it is in an emergency situation, or for other urgent information transmission aircraft equipped with ADS-C may activate emergency mode and / or urgent mode in the following cases: a) emergency, b) failure of communication, with) незаконного вмешательства, d) минимального запаса топлива и/или, e) медицинской помощи.
About the priority approach	The information includes data about where exactly the order will make the first landing aircraft.
Incidents during air traffic	Information on minor unplanned situation that occurred while driving, did not influence the course of flight, but require more detailed examination and analysis on the ground to avoid repetition of the incident in the future.
The presence of birds	Information from the pilots of the presence of hazardous concentrations of birds in a defined area of flight to avoid other aircraft of the danger.

Thus, information security has a special place in the economic security of air transport enterprises. Since only coordinated activity of all elements of information system air transport companies will not only avoid unwanted and abnormal situations, but also contribute to proper development of the aviation sector in Ukraine, the restoration of a stable position in the international market.

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Mizyuk V. Ph.D. (NAU, Ukraine)

IMPROVING THE EFFECTIVENESS OF AVIATION SECURITY AT AIR TRANSPORT ENTERPRISES

The article investigates nature, conditions and problems of definition and improved efficiency of aviation security at air transport enterprises. Keywords: efficiency, security, aviation security, air transport enterprise.

The ICAO documents state that AVSEC is complex of measures which are used to protect aviation personnel, passengers and cargo against acts of unlawful interference.

The problem of improving the efficiency of aviation security is to use the minimum amount of borrowed resources (labor, material and financial) and the clear implementation of legislation on aviation security to achieve the maximum possible increase in the desired outcome (prevention of acts of unlawful interference, reducing their number, risk mitigation, etc.). Therefore, only the skillful use of all of the above factors can provide sufficient growth of *aviation security efficiency.*

The development of aviation technology is stimulated by many factors, including priorities change over time, but such factors as safety, always ranked first (Table 1).

Table 1.

Priorities of Civil Aviation evolution factors

1950-1970	1970-1980	1980-2000	After 2000
Safety	Safety	Safety	Safety
Speed	Economic efficiency	Environment protection	aviation security
Range	Comfort	Economic efficiency	Environment protection
Comfort	Resources	Resources	Economic efficiency

Efficiency of civil aviation is defined by the completeness of the above factors and indicates the uses of resources (vehicles, personnel, fuel, time, funds, etc.) for production and meeting demands. The measure of effectiveness is the range of changes in service provision and infrastructure to reduce the cost of resources per unit of output.

In broad terms the concept of efficiency includes a number of indicators which are: capital, operating costs and maintenance costs, speed of transportation, the price for the use of transport space, rates, benefits consumers and operators, travel costs for one passenger; ability to transport the load factor for load and public transport etc.

Quality extends the concept of efficiency of transport by displaying the benefits of which include the following:

- security - passengers and cargo reaches destination in the same state, from which began transporting;
- Flexibility - the ability to adopt the system to different needs or conditions which are characterized by length of available tracks, available means of movement, ease of entry into service and the withdrawal out of it to the size and type of cargo and the size and volume of traffic, ease of use (including the timeliness and availability of information), matched the payment system;
- Comfort - factors which create conditions for pleasure travel for passengers;
- Accessibility - easy access to transportation facilities and to information about transportation services.

The effect of regional economic development by implementing transport projects is based on specific factors such as cost of transportation (business and private trips), expansion of the business

market, access to jobs and quality of life. More than 4.5% of the world production can be attributed to aviation component. In 1998, as a result of air transport activities the world produced products of 1360 billion US dollars and created 27.7 million jobs.

The above indicators of economic development depend primarily on the efficiencies, safety and security of transport services in the region. The tragic events of September 11, 2001 in the United States stopped the growth and even showed the decline of air transportation (see Fig. 1.2) indicators of air traffic: 5% - on international routes and about 2% - on the domestic routes. Events September 11, 2001 caused the deaths of thousands of people, undermined public confidence in air transport, caused a sharp decline in the activity of civil aviation and was a shaking the world economy.

The combination of recession and a sharp reduction in demand for air travel led to increased operating expenses due to the rapid growth of spending on security and insurance. Operating losses of airlines in 2001 are estimated at more than 10 billion dollars (3.6% of operating income, although in 2000 the profit 3.3% was achieved), despite giving them some financial assistance to the regions.

Aviation Security - a set of measures and human and material resources intended to protect civil aviation against acts of unlawful interference.

Aviation security efficiency - the ratio of the results achieved, which is equal to the sum of prevented financial losses due to preventive actions against unlawful interference (mitigation, reduction of losses due to threats to commit acts of unlawful interference, etc.) to the value of the resources involved and the amount of committed expenditure on aviation security.

The effectiveness of aviation security can be seen from the economic and social aspects:

- Economic efficiency of aviation security reflects indicators of intermediate and final results of the aviation security service;

- Aviation security social efficiency includes the needs of population, creating the appropriate conditions of aviation security personnel, improving protection of aviation from acts of unlawful interference.

Activities in the field of aviation security is a part of aviation companies core business, as key performance indicators in some way characterizing the activity and aviation security in general. But for comprehensive evaluation of the effectiveness and dynamics of aviation security as specific particular function. The main indicator of aviation security is the presence or absence of acts of unlawful interference. It depends on the level of threat to commit acts of unlawful interference in a particular state.

Analyzing the effectiveness of aviation security, relative indicators are used. They indicate the number of events for a certain amount, involved set of measures, human and material resources (a certain amount of work performed: flight hours, number of landings, number of passengers, etc.):

- ✓ number of acts of unlawful interference, which has been avoided, during 100 million miles flown;
- ✓ number of acts of unlawful interference, which has been avoided, for 100 thousand flight hours;
- ✓ number of acts of unlawful interference, which has been avoided, during 100 thousand of flights;
- ✓ number of acts of unlawful interference, which has been avoided, per unit costs;
- ✓ the number of survivors at acts of unlawful interference per 1 million passengers;
- ✓ the number of survivors at acts of unlawful interference for 100 million pas.-mile transportation;
- ✓ the number of survivors at acts of unlawful interference per unit costs.

In general, the relative efficiency of aviation security can be represented as:

$$E_i = \frac{n_i}{F_i},$$

where E_i – relative efficiency of aviation security; i – a particular type of event (acts of unlawful interference, death as a result of acts of unlawful interference, etc.); n_i – number of events of this kind (of acts of unlawful interference, which has been avoided, the number of survivors at the acts of unlawful interference, etc.); Fi - involved a set of measures; human and material resources.

The level of effectiveness of aviation security measures at an air transport enterprise depends on many factors. Therefore, to solve practical problems critical importance of identification and analysis has been stressed. The main factors of efficiency of aviation security shown in Fig. A.

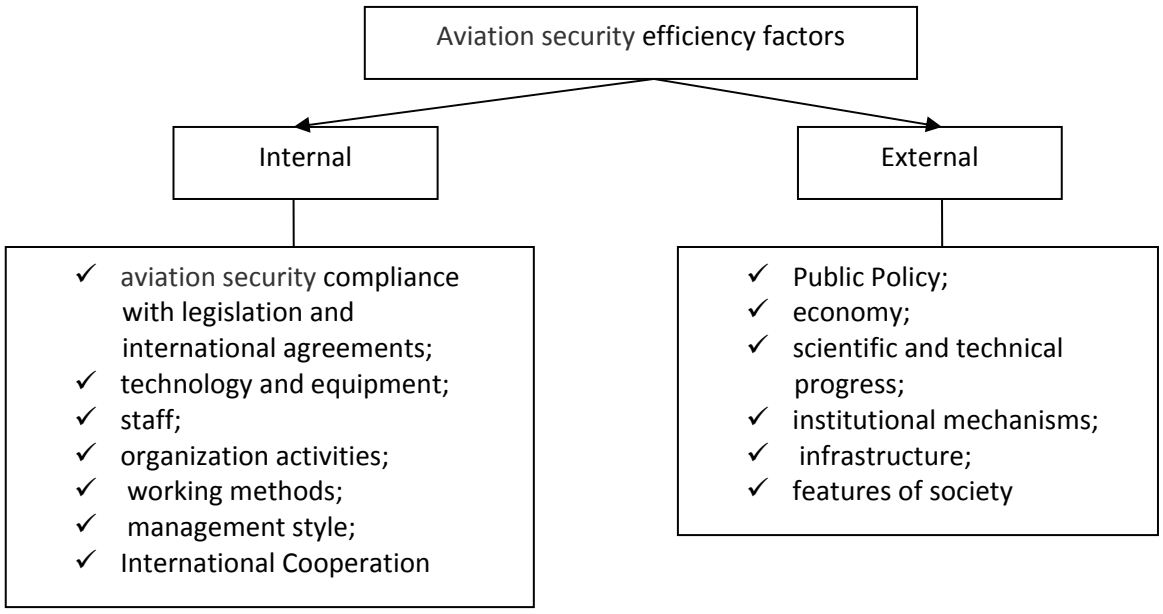

Figure 1. Determinants of the effectiveness of aviation security

Thus, the effectiveness of aviation security depends on the number of both internal and external factors. It can be represented as a function of:

$$E_{AS} = f(k1, k2, ..., kn)$$

where E_{AS} - the effectiveness of aviation security;
k1, k2, ..., kn - internal and external factors which affect it.

The effectiveness of aviation security depends on the implementation and compliance with applicable law.

An important prerequisite for the aviation security positive effect is a sufficient level of infrastructure development and scientific and technological progress. Features of the society also affect the performance of aviation security, particularly technological procedures to control the security (mentality, gender, age, etc. of subjects, and this affects the quality and speed of their implementation). These factors directly influence the effectiveness of aviation security of aviation enterprise.

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V.Komandrovska
Ph.D. economics, associate professor
(National aviation university, Ukraine)

MANAGEMENT OF INNOVATIVE DEVELOPMENT IN AIR TRANSPORT ENTERPRISES

In the article researched the essence of innovations and the management mechanism innovative development, the model of the mechanism of innovative development of the enterprises, considering interaction of resources of the enterprise, tools of the competition and institutional factors for formation of innovative target programs in the air transport enterprises.

The problem of innovation development of air transport enterprises is an important theoretical and practical task of economic restructuring. Today Ukraine's aviation industry has faced a number of problems that can be solved by the innovative development of aviation companies:

- morally and physically obsolete fleet and fixed assets in general;
- lack of infrastructure of regional and international airports in Ukraine;
- lack of transportation technology process, the lack of of information support;
- insufficient development of a network of transport routes;
- insufficient integration rate of Ukraine's transport complex in the European and global transport systems;
- inconsistency of Ukrainian legislation in the field of international aviation and European standards.

Modern scientific and theoretical base of understanding of innovation, innovation processes and management of innovative development is quite broad.

The term "innovation" was put into practice by the Austrian economist Joseph Schumpeter, which considered the innovation as a new combination of existing productive forces to solve business problems and as a source of innovation development of economic systems [8].

in modern terms definition of innovation theory of J. Schumpeter which oriented on the form realization of innovation necessary to clarify, due to the appearance new approaches.

The analysis of existing approaches to the concept of "innovation", allows us to organize them the following way.

The first approach is related to characteristics of technical and technological innovation results. Innovation is seen as an investment in the economy, providing a change of equipment and technologies. Such approaches are too straightforward, reflecting only one of the characteristics of the studied categories.

In the second approach, innovation is seen as the result of innovation, which was implemented in the form of new or improved product introduced on the market, new or improved technological process used in practice, or a new approach to social services.

The third approach is related to the research category of "Innovation" as a process that includes the main stages of innovation. Thus, N. Lapin considers innovation in two ways. On the one hand, this complex process of creation, dissemination and use of new practical tool for the new (or better meet the already known) social needs. On the other hand, a process connected with innovative changes to the social and material environment, which is its life cycle [4]. According to A.Titov, innovation is a process in which scientific idea brought to the stage of practical use and begins to give economic effect, that becomes the economic content [6].

The fourth approach considers innovation as change. For example, F.Valenta treated innovation as a change to the original structure of the production organism, ie the internal structure of the transition to the new state "[2]. L.Vodachek and A.Vodachkov [3] treated innovation as targeted change in the functioning of the enterprise as a system.

In our opinion, the consideration of the theory of open innovation is important and relevant

because it most accurately reflects the processes of globalization of market innovation.

Open innovation include the opening of the innovation process of the economic system (country, region, enterprise) and, thus, active strategic use of the outside world to build their innovation capacity. At the meso-and micro-levels, this process is realized through cooperation between the enterprise and open research institutions.

According to H.Chesboro open innovation are the paradigm within which companies can and should use internal and external ideas, interior and exterior entry work to improve their own technologies. Open Innovation connecting the external and internal ideas in the system requirements for a defined business model [7].

In our view, the formation of organizational-economic mechanism of the development of innovative businesses should consider the processes and principles of open innovation to ensure the effectiveness of the innovation process.

According to the rules of an open innovation system of innovative development based on the following principles:

- The notion of innovation as a competitive advantage;
- Receptiveness to innovation society and individual enterprise;
- The use of innovative models of self-development company;
- Organization of innovation-based development of innovative targeted programs.

The main elements of the mechanism of the development of innovative enterprises are:

1) goal management - perspectives of innovation development of enterprises;

2) criteria for management - quantitative similar purposes;

3) management factors - elements of object management and communication, which is influential in the achievement of goals;

4) methods of influence on these factors control;

5) management of resources - the potential of the company, which is implemented using the chosen method of management and provided to achieve the goals.

Innovative targeted programs is the mechanism organizing the innovative development companies.

Innovative target program is a set of operations (actions) to achieve the objectives of innovation and thus to achieve a global goal. The program goals are linked with resources.

The company may have several innovative programs, each of which focused on achieving the intermediate goal a certain level of tree targets or can be developed a comprehensive target innovative program that consists of several subroutines.

Innovative targeted program of the company, as stated in the works S.Yurina can be described by a model. To construct the model target innovation program should, firstly, set list and the relationship work, and secondly, to establish the costs of resources, time of work and results that can be obtained as a result of work.

Innovative target program can be viewed as an innovative strategy, as it includes the purpose of innovation arising from the global target company, and options for achieving this goal.

Management target innovative program, and hence the development of innovative enterprises is realized through the management functions inherent in a dynamic cycle management program.

Innovative targeted program of enterprise development include long and short elements (Figure 1).

The strategic elements of the program of innovative enterprise development is:

- the concept of innovation - the main ideas underlying the targeting of which stage of the program, and these ideas for each stage of the program are supplemented with necessary details and form concrete objective implemented phase;

- innovation strategy - with this approach is a set of principles and methods of targeting their achievement for any phase of the program, which dictate how should be implemented conceptual, depending on the actual current situation at the beginning of each stage.

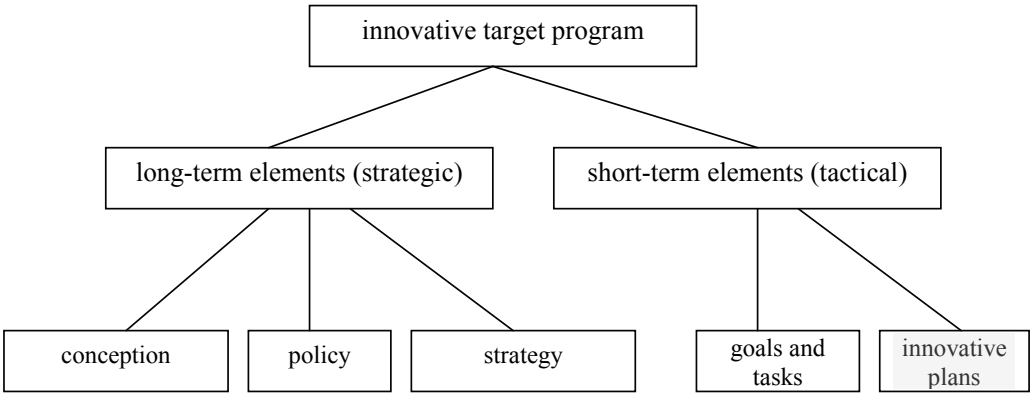

Figure 1. Key elements of the target innovation program of development of enterprises

Among the environmental factors that have a determining influence on the development of enterprises, in our opinion, it is advisable to select the most important, forming conditions and medium enterprise development.

These institutional factors and competition. Provide a direct impact on data factors of the company can not, however, these factors determine the process of innovation development in a specific enterprise as finding the most effective adaptation to the competitive environment in the given institutional framework of general development.

The influence of institutional factors on the level and innovative part of the development process objectively reflected in the "Institutions and Economic Development" by O.Suharev[5]. He says, "to understand the economic realities and trends in national economies, we need to know the laws of functioning even basic institutions that structured information about the behavioral reactions of economic agents that create expectations models, models and proactive actions rather stable model evaluation.

In addition to institutional factors for the effective implementation strategy of innovative development companies is a powerful resource base company that allows to realize innovation in all areas of management and promotes innovation potential of enterprises.

Interconnection of institutional factors, resources and mechanisms of competition in innovation development is seen by U.Kovalchuk [3].

U.Kovalchuk highlights that the movement trajectory to the desired resource potential of the industrial enterprise based NTP, institutional environment, competition, and available capital is only possible on the basis of modernization, which combines features and new design and innovation, as resources can be replaced, updated and stored in the current state. Note that in certain sectoral and regional environment formed the mechanism of interaction resources of the enterprise, the competitive market environment and existing innovations, subject to their availability, to select and justify the most rational option development.

Action mechanism of the development of innovative enterprise is that the management control system (control subject), based on objectively existing principles affect various methods of controlled system (object management - innovation) in order to ensure that the goals of innovation development.

The analysis of the main functions of management was the model of the mechanism of innovativeness, which is presented in Figure 2.

The model of innovative activity allows companies to identify and formalize the basic relationship between the management and direction of the link, the object management. Thus the proposed model included innovative initiative part of the company, that is, we believe that if within the state and regional policy created incentives for the development of innovation in enterprises, the enterprises themselves, based on an innovative way to develop more initiative participate in all programs innovative development, encourage innovative activity of the participants of the innovation process within the enterprise.

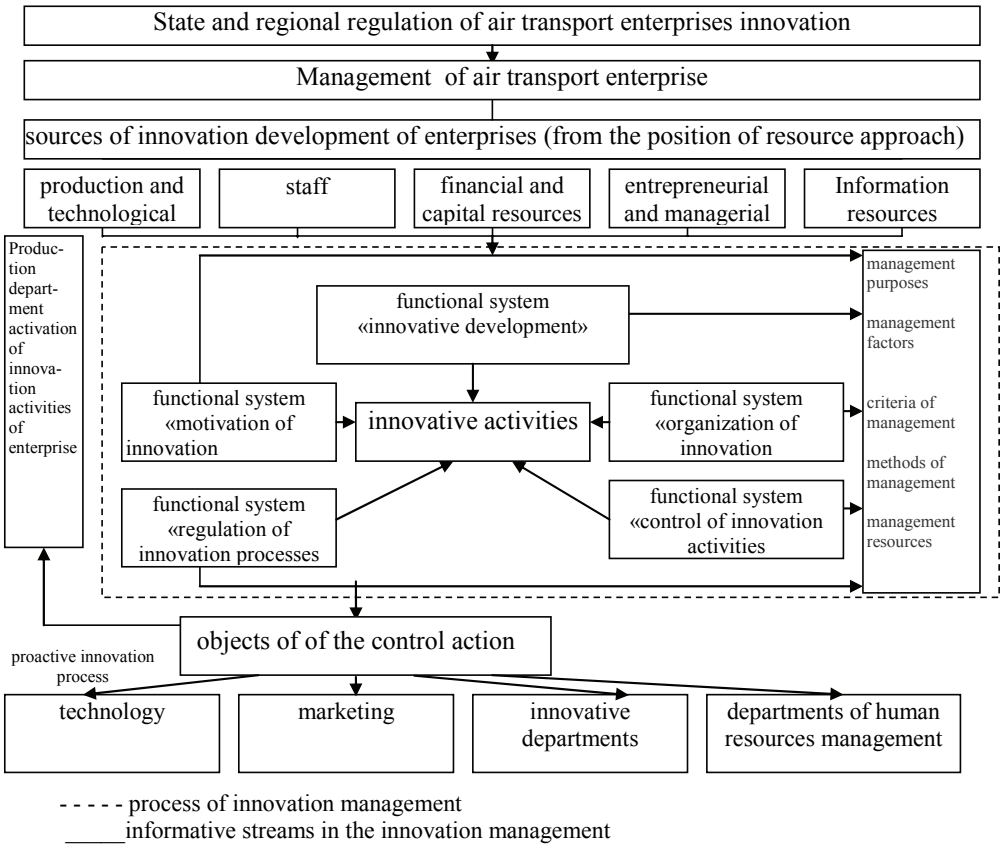

Figure 2. Model of organizational and economic mechanism of development of management of innovation development of enterprises

At the same time most companies, acting as centers of innovation creation can not only implement their own process of production and management, but also use them as a product to achieve the objectives of foreign trade, competitiveness, the sectoral integration and cooperation.

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G.V. Astapova, the Doctor of Economics (National Aviation University, Ukraine)
S.T. Piletskaya, Ph.D. (Donbass State Machinebuilding Academy, Ukraine)
R.E. Shcherban, postgraduate (Donetsk University of Economics and Law, Ukraine)

THE FINANCIAL INDEPENDENCE AS A CONDITION OF CORPORATE SECURITY AIR TRANSPORT COMPANIES

In the article there is proved that the concept of financial independence of the companies is the theoretical basis of the corporate security and combating the financial resources misuse of the air transport companies. The reasons of misuse of the own and borrowed resources of the air transport companies from the position of the financial independence concept are identified. There are disclosed the essence and the need for corporate security and ways of ensuring it.

In nowadays the financial relationships between the air transport enterprises and the state determine the successful course of market processes in Ukraine. The growing budget deficit, the inflation and depreciation of capital, the increasing amount of unprofitable enterprises, large tax burden, and increased public debt payment crisis, all this shows the need to improve the financial mechanism of the enterprises economic regulation, especially the regulation of relations between enterprises and the budget system, the impact by the overall fiscal policy and credit institutions (stock market, commercial banks, investment institutions) on the real sector of economy.

In recent years, Ukraine air transport companies operating under insufficient financial resources to meet the needs of their operations and economic development. Unsatisfactory the air transport companies financial situation due to not only the negative impact of environmental factors, but also errors in the state financial policy that led to the accumulation of structural imbalances in the system of reproduction, reducing its efficiency, competitiveness, causing an increase in domestic and external debt, the national economy state regulation system weakening.

The system of financial relations between the state and the air transport companies formed as influenced on objective processes and needs of the economy and society, and as a result of a financial policy. The objective part of the financial relationships is determined by the opportunities and needs of companies' reproduction. As more the outflow of financial resources in the enterprise is lower, than there are more opportunities for their economic development. But in reality the need for some redistribution of the financial resources is dictated by the needs of the national economy enterprises. These are not only internal factors of the enterprise, but also political factors. Thus, in current conditions the financial resources for grants and funding the coal industry, a number of industries and agriculture needs and more are reallocated through the budget.

The financial relations between the state and the air transport companies are only part of their interaction, which includes property relations, regulation and management of money and credit and banking system, foreign policy factors.

The researching the financial relations between the state and the air transport companies should identify the following aspects:

- the independence of the financial relations as a subject of theoretical analysis (Financial Relations);

– the fundamental differences in market financial relationships that determine the specific type of market relations between the firms and the state;

– the functional role and effectiveness of the financial relations in formation financial policy aimed at the ensuring conditions for economic development and business in particular;

- the dependence of the financial mechanism and the nature of state action and the political conditions.

The economic theory considers two types of approaches to the financial relation's organization - methodological and methodical. The methodological approaches apply the principles and rules of formation and development of the financial relations. These approaches include:

– the integration approach, which aims to study and relationship's strengthen between the individual subsystems and the elements of finance;

– the marketing (logistics), that involves targeting of funds to address the problems associated with the use of the population's funds, the funds of businesses and other economic entities;

– the functional approach in which the effect of the financial system is considered as a set of functions that should be performed to achieve certain effects;

– the targeted approach, which defines a set of effects (purposes) of the financial system and the way to achieve them (trust units) is determined;

– the dynamic approach, which involves the financial relations consideration in the dialectical development, cause-effect relationships and dependencies, and the subordination of the all levels of the financial system;

- the reproduction approach that focuses on continuous process of rendering financial resources;

- the regulatory approach is focused on establishing financial standards for all subsystems of the financial system;

– the situational approach that considerate the specific situation which might arise in any subsystem in the financial system as an object of study;

– the process approach, which determines the priority of financial control over the rest of the functional components of the financial system;

– the reflection approach, which consider an objective description of the financial system as a subject of study together with the characteristic behavior of economic subjects;

– the synergetic approach in which patterns of economic entities functioning in chaos, crisis and instability are the basis of researching. This approach focuses on the incorporation of natural factors of the financial system and display processes to achieve new states of the financial system without deliberate external influence.

These approaches to financial relations actually reduce to approval according to the elements of finance sets factors to external and internal environment. The most unfavorable are the political conditions (political situation, political crises, etc.). The synergetic approach is exception only in terms of "voluntary isolation of the environment influence." Thus, under this approach the financial system is likely to influence on environment development and doesn't affect to activate its effect. In case of purposeful nature of the negative impact of the environmental the financial system subjects to this influence and inefficient development. Thus, the analysis these approaches suggests that there is no methodology that describes the processes limiting the negative factors of the environment influence on the financial system.

Solving this problem is possible on the basis of unsynergetic approach to ensure the effective finance development under the influence of unfavorable political conditions. The essence of the approach is to consider the conditions of independence of each element of the finance from the adverse effects of political conditions. It foresees the creation of the new concepts, categories and criteria of independence for each element of finance and mechanisms to achieve it.

The influence of political markets on the economy of the enterprise is as controlling the financial flows of enterprises as the main sources of funding of political parties.

According to the theory of ownership by R. Coase the using of enterprises funds is possible when there are property rights, and also depends on the value of this right and the result of the financial and economic activity.

The combination of political and economic relations, which happened in Ukraine, makes the company dependent on the validity of adverse political factors. So from these it follows that the institution of state power in relation to the company acts only as an ineffective "consumer" of its financial resources for its own operation and gives nothing in return.

New institutional economic theory and other economic theories do not explain the conditions and methods of combating the negative impact of political enterprise markets.

These circumstances indicate the need to develop financial independence, business aviation industry in the current political and economic environment for their stability and effective

functioning. The need for financial independence of the company is the following:

- an economic nature of the enterprise as a business unit to effectively work (viability);

– the provision by financial resources, because their presence is a factor of enterprise functionality, as a part of the resource potential of the enterprise;

- the companies' finance may be used as a source of financing of the political activities.

The influence of political markets on the economic development of enterprises reflects the concept of economic development of the enterprises based on "financial independence". The financial independence of enterprises is available as a result of the formation and action of the four mechanisms - mechanisms of development and strategy company financial independence, the mechanism of formation of equity and loan capital and its structure, the mechanism of formation and management of financial flows of the company, the mechanism of regulation FEA enterprises.

The concept of "financial independence and business" includes the following aspects:

- the strategy financial independence airline industry is based on the accounting impact of environmental factors;

– the formation of own and loan capital and the management of its structure is based on combining the economic interests of enterprises and economic and political interests of owners;

- the management of financial flows is based on combining the economic interests of the company, market and state;

– the effectiveness of economic activity is achieved by taking into account the political conditions for the conclusion of foreign trade operations.

The difference between the concept of "financial independence and business" and the key concepts emerging within the new institutional theory is as follows. The underlying concept of the transactional theory by R. Coase is the idea of the role of transaction costs, the costs associated with entering into agreements. These include the costs of obtaining the necessary information about price and quality of goods, the costs of negotiating, drawing up contracts and agreements, control over their implementation and legal protection of ownership rights in case of violation. The concept of organizations by O. Williamson is based on applying the concept of the transactional theory by R. Coase to the so-called vertical integration, which is a division of labor co-operatives and small and large enterprises, in which there is a competition. The new concept complements the content of transaction costs by the list of expenses related to capital formation and conduct of foreign operations of the enterprise.

The concept of "financial independence and business" doesn't only enhance the new institutional direction of economic theory, but also acts as a basis for the forming a concept of limiting the political factors influence and provides combating the misuse of financial resources and Corporate Security of the air transport companies.

The condition of improper use of air transport enterprise serving is their lack for funding the needs for current operations. The determining the impact of this factor on their use of funds granted inappropriately performs for evaluation of the financial state of air transport enterprises.

The financial position of the company is its ability to finance their activities. It is characterized by provision of financial resources that are necessary for normal functioning of enterprises in regard to their placement and effectiveness of their use of financial interaction with other legal and natural persons, solvency, financial stability.

Financial condition is also seen as a set of indicators that reflect the presence, location and use of financial resources.

The analysis refers to knowledge about objects and phenomena of the environment, based on a division into its component parts and studying them in a variety of relationships and dependencies.

Financial analysis allows you to assess the status of the enterprise, the degree of business risk, capital adequacy for current activities and long-term investment, the need for additional sources of financing, the ability to capital accumulation, rationality borrowing, bringing policy and the distribution of income.

The results of the financial state analysis of the airports, which are predominantly state-owned entities, indicate the possibility (probability) of misuse of funds (for example, instead of the applied financing enterprise development funds aimed to meeting the needs of current operations or to

finance political structures). Thus, most state air transport companies have satisfactory financial state and are profitable, but can use a single source of funding for their development - means the State or local government budget. But in case of shortage of budget funds due to budget deficit, the development of aviation may be discontinued.

As sources of financing operating airline also use their own funds allocations. However, data on the dynamics of the financial independence coefficient of airport indicates the lack of own funds and not meeting the needs of most air transport companies operating from the number of patients. This causes the presence of possibilities of misuse provided to finance the development of airports in the area of financing operations.

The scarcity of bank lending to state air transport companies due to the presence of the great risk of non-collateral borrowers if there are insolvency and likely misuse of bank loans.

With regard to areas of funds outflow, the needs of operations are mainly due to underfunding of mainly environmental and social measures. Information about misuse of their own and borrowed funds indicate that the funds are scheduled for implementation, including environmental measures, almost fully used for other purposes (regardless of funding sources).

All this threatens the loss of financial independence and security of corporate airline credit scheme as intensifying corporate capture.

The corporate security is system for ensuring the preservation of corporate rights by improving corporate control (instrument) and ensuring corporate security (target).

The corporate control is a set of controls financial and business enterprises by the owners. Control of businesses is both outside and inside. External control is divided into external supervision (by foreign investors and state bodies corporate control) and external audits.

The need for active measures to protect corporate due to several factors:

– special status corporate enterprises in society, because they "double" operate with public money: on the one hand, the formation of equity, on the other - in attracting resources to the creation of subordinated capital;

– specific nature of the relationship between corporate enterprises as legal entities and their owners on the formation and change the capital structure;

– the presence of a variety of corporate risk, potentially able to promptly bring the corporate enterprise to the state of financial dependence;

– ability only at the state level to ensure implementation of a number of measures to support the implementation of the norms of corporate law.

Conclusions

Thus, the concept of "financial independence and business" doesn't not only enhance the new institutional direction of economic theory, but also provides corporate aviation safety. The corporate security is understood as a set of conditions for effective management of corporate property by different groups of owners. The differences between the corporate security and the security of corporate capture are characterized in that the corporate airline may not be able to conduct business without interference by outsiders, resulting in inefficient allocation of corporate shares. Therefore the main task of corporate protection should be identifying the factors creating inefficient allocation of corporate shares, misuse of financial resources and threats of loss financial independence of the air transport companies.

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A. Gudmanian, Dr. Sc., Full Prof.
G. Encheva, PhD, Assoc. Prof.
T. Semyhinivska, Senior lecturer
(National Aviation University, Ukraine)

COMMUNICATION IN FLIGHT SAFETY: LINGUISTIC CONTROL OF SHARED PROBLEM SOLVING

This article addresses the influence of linguistic factors on communications and how these factors are related to flight safety. Linguistic problems can arise any time people are communicating and are especially a problem when one or more of them is not a native speaker of the language being used. The objective is to describe the linguistic characteristics of communication failures between pilots and air traffic controllers.

Introduction

In order to improve flight safety, the International Civil Aviation Organization (ICAO) has published the new document *Manual on the Implementation of ICAO Language Proficiency Requirements* in which English language level and proficiency for air pilots and air traffic controllers are strictly set out. The document, *Doc9835* for short, approved by the ICAO Assembly, signed by the Secretary General and published under his authority, is based on the proposal by the accident investigators who find that insufficient English language proficiency of the flight crew or a controller can play a contributing role in the chain of events leading to accident. The ICAO language proficiency requires to: strengthen the requirement for English to be provided by air navigation service providers; establish minimum skill level requirements for language proficiency for flight crews and air traffic controllers; introduce an ICAO language proficiency rating scale; standardize the use of ICAO phraseologies and recommend a testing schedule to demonstrate language proficiency.

English is the official language of aviation. Language usage is known to be a problem in cross-cultural communication [1]. Today, English is spoken by more non-native speakers than native ones. Many flight crews are now composed of nonnative English speaking pilots from different countries. This situation, combined with the fact that many controllers are non-native speakers, can lead to substantial communication issues that can affect flight safety. Therefore, any discussion of communications must focus not only on the intelligibility of non-native speakers to native speakers but also on the interaction between non-native speakers.

Task Arrangement

Language is an important element in effective and competent communication. Effective communications within crews and between crewmembers and controllers are essential for safe air travel. The design and implementation of standard phraseology intended to be used without variation throughout the world can address many but not all language issues. In many circumstances, pilots and/or controllers must resort to the use of higher level English to convey a message. Even when both pilots and controllers speak English fluently, there are pitfalls in the nature of the language and the way that language is heard that can affect safety [2]. To speak and to understand a language it is not sufficient to know vocabulary and grammar. Also, within English some words have dual meanings and can easily be misunderstood. Cushing has collected a number of cases, from reports of the National Transportation Safety Board (NTSB) and especially from informal reports of the pilots newsletter *Callback*, in which properties of language and language use caused accidents or near-accidents in aviation [3]. Typically, such cases arise because the cognitive apparatus of the pilots is preoccupied and overloaded with paying attention to problems such as equipment failure or adverse weather conditions; also, communication can be severely impeded in the noisy cockpit or in the radio talk with the air traffic control (ATC). Our ***main objective*** in presenting this paper is to outline the theories associated with errors in ATC-pilot

miscommunication caused by language.

Analysis and Comprehension

Major studies related to pilot-controller communication errors have been based on the analysis of confidential reports from the Aviation Safety Reporting System (ASRS) database. Grayson and Billings analyzed more than 5,000 confidential reports and identified 10 categories of pilot-controller communication problems [4]. Two of the categories – misinterpretation (phonetic similarity) and ambiguous phraseology (more than one meaning) – are directly related to linguistic issues.

More recently Eurocontrol organized a reporting campaign for European airlines and air navigation service providers. This campaign used a survey of airline pilots and air traffic controllers in Europe to assess communication problems. The survey revealed a large number of reported occurrences of air-ground communication problems. Reported problem areas included loss of communication and readback/hearback errors. Linguistics was involved in a great number of these communication problems. Language seems to be one main aspect criticised in ATC-pilot miscommunication because it acts as a medium to link people understand each other. Boschen and Jones proposed that causes for confusion in ATC English message particularly by non-native speakers were "Linguistics" (e.g. ambiguities in meaning/harmony, word order and rules of English) and "Numeric" (e.g. non-metric unit and complex configurations) [5]. In terms of linguistics, four relevant subjects: phonology (including prosodic features of speech e.g. stress, intonation, pausing, volume and speech rate), syntax, semantics and pragmatics (including rules and meaning generated by the non-linguistic context), may affect the appearance of communication errors.

Linguistic factors. This section discusses the basic linguistic elements affecting miscommunications.

Phonology. Voice communication still plays the prime role as a means of rapid transfer of information. The factors which can affect the speech perception can be classified as (a) Aviators speaking status (b) Effectiveness of communicating system and (c) Presence of adverse conditions which interfere with the communication. It includes voice intonation, stress, rate of delivery and pause/hesitation. These factors can change the form and the meaning of sentences by acting across individual sounds or words of a sentence. In one particular instance that led to an accident, ATC did not perceive the severity of a flight's fuel crisis because controllers did not perceive a change in stress or pitch in communications with the crew [6]. In turn, ATC did not give high priority to the situation, and the aircraft crashed.

Another problem area in aviation arises from excessive pausing during radio transmissions. When someone pauses for a long time during a transmission but does not release the radio talk button, incoming communications are masked. Also, an excessive pause can invite another person to begin a transmission that will "step on" or mask the original transmitter's communications. When under stress or in complex situations, speech becomes more rapid and frequent and can make communications very difficult to understand. Under these stressful conditions, changes in voice pitch can cause "slips of the tongue" that can lead to misunderstandings and errors [7].

Pragmatics. Grayson and Billings found that many pilot-controller misunderstandings can be attributed to expectations that lead the listener to hear what he or she was expecting to hear instead of what was actually said [4]. The expectation of a particular instruction can prime a pilot to mistake an unrelated communication for the anticipated instruction. *Pragmatics* is a branch of linguistics concerned with bridging the gap between a speaker's intended meaning for a phrase and the phrase's meaning to the hearer. For Grice, the crucial feature of pragmatic interpretation is its inferential nature [7]. The hearer is seen as constructing and evaluating a hypothesis about the speaker's meaning based on the meaning of the sentence uttered and on background or contextual assumptions and general communicative principles that speakers are normally expected to observe. Context here is the situation since it may include social, environmental and psychological factors.

Although speaking a common language is essential, pilots and controllers must also share the same context. One example of the impact of having different contexts occurred when a controller,

noticing on his radar a decrease in altitude for a flight, radioed the flight crew, “How are things coming along up there?” in reference to the decreasing altitude.

However, the crew had been preoccupied with a nose gear problem and had informed several controllers, but not the current one, about the issue during their flight. The crew responded “OK” to the controller’s questions. The crew, unaware of the altitude problems, was referring to the nose gear problem it had just managed to fix. The controller interpreted OK as referring to the altitude problem. The aircraft subsequently crashed.

In each of these examples, the accidents may have been avoided if the expectations of the controllers and crews had been more aligned.

Semantics. Some pilot-controller communication errors arise when words sound or look alike but have different meanings. Such words are called homophones, homographs or homonyms. Homophones are words that sound alike but have different meanings and may or may not be spelled the same way (to vs. two). Homographs are words that are spelled the same way, but have different meanings and may or may not be pronounced differently (sewer, a conduit for waste vs. sewer, a person who sews). That is, true homonyms are spelled the same and sound the same, but have different meanings (bear may refer to the animal, or to a movement in a certain direction). The word homonym, however, is often used to refer to both homophones and homographs.

An example of a communication error involving a homophone is: ATC cleared an aircraft for descent to “two four zero zero”. The pilot read back, “ok. Four zero zero.” The aircraft then descended to 400 feet instead of 2400 feet. The pilot mistook the number “two” to mean “to” and descended accordingly. Common aviation homophones: Brake / Break, One / Won, Two / To, Missed / Mist, Right / Write, Hear / Here. Common aviation homographs: Content (accept) / Content (things inside), Close (shut) / Close (near), Right (direction) / Right (correct). Homonyms (same sound and spelling but different meaning): *Aircraft* – one or many aircraft, *Zulu* – name of letter Z / time at Greenwich meridian, *Remain* – localization / radio frequencies, *Go ahead* – urge speaking / forward motion.

Synonyms are words or phrases that sound different and are spelled differently but have the same meaning. There are 49 instances where the Federal Aviation Administration (FAA) and ICAO use different words for the same meaning. Some common aviation synonyms are *Fly around the airport* – Circle the airport / Circle the runway / Go around, *Tell your speed* – Say speed / Say Mach number, *Paved area near the runway* – Ramp / Apron / Tarmac, *Time* – Greenwich Mean Time / Zulu / UTC.

The above examples are taken from “The Pilot’s Reference to ATC Procedures and Phraseology” referenced by Jones [9].

Conclusions and outlook for further research

Our approach: proficiency in English is essential to flight safety, but even native speakers of English have communication problems. Flight crews need to be aware that non-native English speakers often cannot distinguish between certain sounds and therefore may not understand a communication. Paralinguistic factors such as speech rate and pauses can negatively affect communication quality. Aviation jargon, especially the use of numbers, can lead to confusion and errors. Homophones, homographs and homonyms can negatively affect communication since words that sound or look alike may have different meanings. There are 49 instances where FAA and ICAO use different words for the same meaning. When in doubt, one should confirm the information.

This concludes our overview of language and communication regarding flight safety in aviation. We could only touch on some of the relevant issues here, partly due to reasons of space, partly because still so little is known in this field. The area we did not deal with here is communication in written texts.

We believe that, this review will make it possible to study more objectively and rigorously such linguistic approaches, as speech act theory, conversation analysis and theories of coherence, which are highly relevant for the study of communication within crews.

Communication processes in aviation is a subject worth studying in detail: it poses serious challenges for theoretical notions and forces researchers to considerable refinements of their

theories. Which is more it can sometimes save lives.

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N. Borysenko, PhD, Assoc. Prof.
(National Aviation University, Ukraine)
M. Tolmachëva, Ph. D., Full Prof.
(College of Liberal Arts, Washington State University, USA)

CROSS-CULTURAL FACTORS IN AVIATION

The paper deals with one of the aircraft accidents involving the human factor. Briefly described is the series of events that led to the air collision that happened on July 1, 2002. The authors then discuss the chain of consequences influenced by cross-cultural factors that later led to another tragedy in Switzerland.

On July 2, 2002 the world of mass media exploded with the shocking news about two aircraft crashing on the night of July 1, 2002 above Lake Constance in southern Germany on Monday night. The Russian passenger airliner Tu-154 of Bashkir Airlines heading to Barcelona, Spain and a DHL Boeing 757 cargo jet flying from Bahrain to Brussels collided at the height of about 12,000 meters. The dead included twelve crew members, fifty seven passengers, including fifty-two children and five accompanying adults who were on board on the Tu-154, and two pilots of the Boeing 737 [5; 7]. The accident was called the worst aviation disaster in Germany’s history.

The Tu-154 was on a charter flight, carrying the fifty best students of a UNESCO-affiliated school in Bashkortostan; they had been rewarded by a couple of weeks vacation at a four star hotel on Spain’s Mediterranean coast. Two other kids (a boy and a girl) belonged to a family from Vladikavkaz (in the Russian Caucasus); they were traveling with their mother to visit their father in Spain.

The tragedy has drawn attention not only of the specialists in the sphere of aviation, but also of everyone who cares about human losses and problems worldwide. Inevitably, the tragedy raised multiple questions, such as “How did this airplane accident happen?”, “Could it have been avoided?”, “Was the accident a result of pilots’ unprofessionalism?”, “Were the actions or inactions of air traffic controllers a contributing cause of the aircraft accident?” and so on.

The meticulous investigation of the crash eventually revealed the causes of the aircraft accident. However, further events connected with the tragedy involved actions that are far from aviation itself, but deeply rooted in people’s cultural consciousness.

There were many versions of that fateful crash, varying from bad weather to pilot error. In most early news reports, the Russian pilots were blamed. For Russians, this readiness to paint their side guilty was seen to reveal Western prejudices and stereotypes regarding Russia.

Even before the planes’ black boxes were found, first accusations had sounded from Skyguide, the Swiss private company controlling the airspace where the tragic plane crash had happened. The company’s representatives declared that the accident happened because the Russian pilots’ English was not good enough and they could not react on the instructions of the air traffic controller properly. The Skyguide officials declared that Russian pilots were given three minutes and two warnings to descend by the Skyguide air traffic controller, but they did nothing. The controllers said they had already asked the Russian pilot to reduce his altitude, but he did not respond at first. The requests would have been in English, and it seemed believable that a language problem caused a misunderstanding.

This accusation raised the problem of verbal language competence across cultures. By the term *verbal language competence,* we mean the knowledge that enables one to produce and comprehend a spoken language. In the light of obstacles in communication across cultures, it is self-evident that this task may present a challenge. In intercultural communication, the better one’s verbal language competence, the greater one’s communication potential. In the aircraft accident, the professionals whose English was a second language were involved from both sides – the Russian pilots and the air traffic controller, a Dane working for the Swiss company. Nevertheless, no one

doubted the air traffic controller's English language competency. In addition, no one suspected the Skyguide's air traffic controller of a lack of technical knowledge, work experience, or other professional qualifications.

When the above accusations against the Russian crew began to appear invalid, Swiss officials shifted the blame to the shortcomings of Russian technology. It was said that the Tupolev-154, not a Boeing 757, was to blame in the accident. The aircraft fleet in Russia was reported to be very old and airplanes were considered unreliable. To gather support evidence for such statements, some foreign authorities had research conducted on the planes used by Bashkirian Airlines. In 2002, its fleet had eight Tu-154s out of 39 Soviet-designed planes still flying. The company mainly served Russia and the near abroad, with some charter flights to other destinations. A Tu-154 crashed in the Siberian city of Irkutsk in July 2001, killing all 143 people aboard. Another Tu-154 belonging to China Southwest Airlines crashed in China in 1999, killing all 61 people aboard. A German-owned Tu-154 collided with a U.S. Air Force C-141 off the coast of Namibia in 1998, killing 33 people, and in 1997, a Tajik Tu-154 crashed en route to the United Arab Emirates, killing 85 people. One more aircraft crashed on takeoff from Irkutsk in 1994, killing 124 people. The cause of that accident was revealed to be excessive cargo overloading of the plane.

When the black boxes from the airplanes involved in the 2002 collision were found and all records of the flight recorders deciphered, an entirely different picture was revealed.

Swiss authorities at first claimed that the Russian pilots had been contacted several minutes before the collision; in reality it was 44 seconds.

Swiss ATC had to admit that their collision avoidance system, which would have given the controller 3 minutes with audible and visual signals of an impending collision, was shut down for repairs.

Although the air traffic in the area of the crash was not heavy that night, it required the work of two flight control officers. However, there was only one man at the control panel, Peter Nielsen of Denmark. The other officer was on an unofficial break.

The Russian pilot had 12,000 hours of flying time and spoke excellent English. The pilot and the crew had worked abroad for three years. They worked together as an air crew in Pakistan and United Arab Emirates, and flown charter flights to Barcelona [10].

The folllowing was the new picture that gradually emerged. The two airplanes were flying at 36,000 feet on a collision course. The Skyguide air traffic controller, Peter Nielsen, was working at two workstations at the same time and did not realize the danger facing the two airplanes until less than a minute before the accident. At that time, he contacted Flight 2937, instructing the pilot to descend by a thousand feet to avoid collision with the crossing traffic – Flight 611. Seconds after the Russian crew initiated the descent, their TCAS instructed them to climb, while at about the same time the TCAS on Flight 611 instructed the pilots of that airplane to descend.

It seems highly likely that the Russian pilot delayed action because his Traffic Collision Avoidance System (TCAS) was telling him to climb and the Swiss controller was telling him the opposite. He dived and struck the 767 because the Boeing's system had ordered a dive. Therefore, in the final accounting, it turned out that the air crash occurred because of wrong instructions given by the Skyguide traffic control officer.

The collision avoidance systems on the aircraft should have alerted the pilots to the danger. If they failed to respond within seconds, the system would have suggested action to avoid a collision. Flight 611's pilots on the Boeing jet initially followed the TCAS instructions and started to descend, while unable to reach the controller because in the meantime he was dealing with Flight 2937. The Swiss controllers later said that it was after the third (!) query that the Russian plane went into a dive, only to crash into the Boeing. Reports suggest that both planes were diving to avoid each other at the time of the crash. Had both aircraft followed the automated systems' instructions, the collision would not have occurred.

The accident raised questions about how pilots must react when they receive conflicting orders from the TCAS and from air traffic controllers (ATC). The TCAS is programmed to assume that both crews will promptly follow the system's instructions. The operations manual clearly states

that TCAS should always take precedence over any ATC commands. It is not required to notify the ATC prior to responding to an RA (resolution advisory, issued by the TCAS). This manoeuver does not require any ATC clearance since TCAS takes into account the position of all other aircraft with transponders in the surrounding area [6, 53]. However, before this aircraft collision, the rule was quite the opposite – the pilot was required to follow the commands of air traffic controllers first, then instructions from the TCAS if they do not contradict ATC's directions. It was believed that machines could make mistakes but people were less likely to err.

In September 2007, four Skyguide employees were found guilty of negligent homicide in a court case examining the events that led to the crash. Their punishments ranged from fines to a one-year suspended prison sentence [8].

Governments of Germany and Switzerland considered themselves obliged to present official condolences to the families of the plane crash victims, and did so soon after the aircraft crash. By contrast, Skyguide made its apologies only two years after the accident when the investigation by relevant committees had proven its fault.

It is worth saying that the whole population of Bashkortostan and North Ossetia was shocked and furious in the wake of the tragic blow suffered by the families and general public when in the very first days after the disaster the Swiss, in defiance of accepted ethical standards, accused the Bashkirian pilots of incompetence and placed the blame on them. The President of Switzerland Kaspar Villiger had to cancel his visit to a memorial service in Russia on Saturday 13, 2002 because local leaders in Bashkortostan had opposed Villiger's attendance at the memorial. The Russian Foreign Ministry informed the Swiss embassy that people's emotions had risen to such a level that the safety of the Swiss delegation on the ground on the Saturday would have been at risk [4].

Another tragedy, closely linked to the aircraft accident of July 2002 and the initial reaction of the Swiss leaders, took place in February 24, 2004. That day, the wife of Peter Nielsen, a former Skyguide's air traffic controller, found her husband dead with numerous stab wounds. Peter Nielsen's three children became orphans.

The next day, at a nearby hotel, Swiss police arrested Vitaly Kaloyev, a Russian citizen from Vladikavkaz, North Ossetia. Vitaly Kaloyev had lost his wife and both of his children in the aircraft collision of July 2002, which resulted from the human error by the Swiss air traffic controller Peter Nielsen. Kaloyev did not seem to try to escape from the police and avoid punishment. Asked why he had stabbed Peter Nielsen to death, Vitaly Kaloyev answered: "Apparently he (meaning Peter Nielsen – N.B., M.T.) did not expect that he would have to answer for the results of his work" [11].

Many Russians donated money to hire the best lawyers to defend their compatriot. During the trial, the defendant was advised by his lawyers to ask for forgiveness from the family of the murdered Peter Nielsen in order to get reduced sentence; but Vitaly Kaloyev refused. He apologized only to Peter Nielsen's children for having left them fatherless. Nevertheless, he did not repent his crime, and it appeared that his future was of no importance to him.

Sentenced to five-and-a-quarter years of prison, he was released in 2007 because he had served more than two-thirds of his sentence with good behavior. Kaloyev's sister Zoya said: "We ... all prayed yesterday for the end of Vitaly's suffering in prison. We always believed that sooner or later justice would prevail and Vitaly would be freed." [9]. For the natives of the Caucasus, sentencing Vitaly Kaloyev to prison had seemed a great injustice. In the eyes of his co-religionists, he had "only" avenged the killing of his family.

Upon his return to the Caucasus, Vitaly Kaloyev was met by the public like a hero. Soon he was appointed deputy-minister of construction in North Ossetia, the position he still holds today [1].

People unfamiliar with cultural traditions in the Caucasus may wonder why a confessed murderer was supported so warmly by his compatriots and was even appointed to a top state post. We should not forget that much of the Caucasus is a Muslim area where Islamic cultural influence has been historically strong. Vitaly Kaloyev's actions are considered quite logical and fair from the point of view of Caucasus natives. Had he had not attempted to avenge the death of his family, he would have fallen in disgrace in the opinion of his compatriots. In the early 21th century, this man followed the centuries-old Ossetian custom of blood vengeance.

Although it originated in ancient times, revenge actions motivated by the tradition of settling scores by blood are still reported in Corsica (France), Ireland (especially Dublin and Limerick), Southern Italy, Mani and Crete (Greece), Iraq and Turkey, northern Albania, Afghanistan, and some other countries. As becomes clear from even this short listing, not all such countries are Muslim, but in Islamic societies, the tradition is strengthened by an aura of religious sanctity.

The most widespread forms of blood revenge are vengeance, vendetta, and collective punishment. By the term, *vengeance* we mean pursuing harm to our offender(s) as retaliation for the wrong we perceive they caused. It is a passionate desire for revenge. In some cultures, especially Muslim ones, blood vengeance is not just a custom, but is deeply imbedded in the social values strongholds of the society. This is exactly how it is viewed in the Caucasus. The Soviet regime tried hard to decrease the role of the Muslim clergy, but those measures only strengthened the significance of ancient customs and unwritten laws. Soviet authorities failed to destroy the custom of blood vengeance in the Caucasus, no matter how hard they tried.

Unlike single acts of vengeance, *vendetta* is an on-going private feud where members of the family of a murdered person seek to avenge the murder by killing the slayer or one of the slayer's relatives. Vendetta was known to be common in the south of Italy and in Corsica. Blood vengeance and vendetta evoke different feelings in different people. Some see the concept as a valid cultural tradition, others believe that it is a custom that hangs over from the old days and needs to be eliminated.

As a form of revenge, many cultures encourage so-called *collective punishment*. According to this principle, it is fair and in many cases expected that anyone associated with the wrongdoer should be punished for the original insult, injury, or loss. Thus it becomes acceptable to punish any man from a certain group because, for example, one individual man of that group raped an individual woman. Today, this destructive and unjustifiable concept is considered an invalid excuse for violence against many innocent people.

Modern scholars believe that Christian countries rooted out blood vengeance a long time ago. The European code of noble honor excludes vendetta but specifies vengeance to a personal wrongdoer. Many European cultures promote the principle of *divine vengeance*. According to this principle, only god, the creator, or supreme being has it within his right to judge someone's behavior and deliver penalty to revenge his or her harmful behavior. In the beliefs of those who follow the Christian tradition, every person faces his or her "judgment day" after the death, and either lives in the paradise of heaven or suffers in the fires of hell for all eternity. For the sake of justice, it should be noted that historically, this position does not seem to serve as an effective deterrent.

Understanding that it is a strong cultural tradition tightly woven into the fabric of Muslim societies, many leaders of Muslim countries try to root out blood revenge not by law enforcement, but by peaceful reconciliation of the conflicts that had happened earlier or recently or happen today. For example, in Chechnya, following the initiative from Chechen President Ramzan Kadyrov, a special committee to reconcile the families in a mutual state of blood vengeance was established in August 2010. In the first four months of its work, the committee managed to resolve 170 conflicts. Some of those conflicts had continued for 50 years and more [1].

The head of the republic urged all the feuding citizens to forgive each other on the threshold of the Holy Month of Ramadan [1]. Local skeptics say, though, that the campaign to end the feuds is not likely to be successful. Blood vengeance can occur not only because of a murder. A car accident can also be a reason to arouse hostility, as has been known to happen, although according to Sharia laws, blood vengeance is permitted as punishment for a private crime. Nearly all Muslim legal scholars have claimed that it was more important to forgive murderers rather than punish them. The Muslim holy book, the Koran, allows "an eye for an eye and a tooth for a tooth" [3] type of retaliation only in cases of premeditated murder and bodily harm.

However, violence begets more violence. The never-ending string of revenge-linked murders may lead to paradoxes, when people cannot even name the reason why they are supposed to take revenge on someone, but they still continue to kill or do arm to each other. Revenge does not ease

anyone's life. Besides, in most prolonged conflicts, it is difficult to identify the offender and the victim because feuds escalate gradually for a long time. Each side is sure they have the most just and valid reason for being the victim and therefore compelled to action. Sometimes even for them it is not clear who started the antagonistic relationship. The victim feels a need to have his or her loss compensated and see "justice" restored. Little reconciliation takes place while sorting out "who started this" and who is the victim. There are no Truth and Reconciliation Commissions for private blood conflicts, and suppressed anger makes them difficult to resolve in the long run.

The line in the chain of tragedies that began on July 1, 2002 seems to have been drawn. The true causes of the aircraft collision have been established, the blunders have been taken into account, and the guilty parties punished. After having numerous commissions analyze all the dramatic events that had taken the lives of seventy-two people and made numerous families across Eurasia unhappy, a worrysome question remains: has enough been learned from this case about the potential role of the cross-cultural factors that are increasingly at play in the global world?

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O. Akmaldinova, PhD, Prof.
L. Budko, Assist. Prof.
O. Pysmenna, PhD, Prof.
(National aviation university, Ukraine)

PHRASEOLOGY OF RADIO EXCHANGE AS AN OBJECT OF THE LINGUISTIC THEORY AND THE THEORY OF SPEECH ACTS IN CONNECTION TO FLIGHTS SAFETY

The article reviews the results of linguistic analyses of the air radio exchange sublanguage in the following aspects: phraseology classification types; the rules of the radio exchange phraseology translation and pragmatic intention of radio communication utterances from the point of view of the theory of speech acts.

It is generally acknowledged now that more and more emphasis must be placed on the genesis of human error as it relates to accident causation, as most accident reporting systems are not designed around any theoretical framework of human error. Those systems have been useful for identifying engineering and mechanical failures but are relatively ineffective and narrow in scope where human error exists. Human factors investigative and analytical techniques are often less refined and sophisticated than those used to analyze mechanical failures.

A comprehensive analysis is being conducted nowadays to determine those specific human factors responsible for aviation accidents and incidents. Here belongs also the study of language mistakes or misunderstanding in radio exchange linguistic communication failures.

The Human Factors Analysis and Classification System describes human error at each of four levels of failure: 1) unsafe acts, 2) preconditions for unsafe acts, 3) unsafe supervision, and 4) organizational influences. The unsafe acts of operators (aircrew) can be loosely classified into one of two categories: errors and violations. Errors can be described as those “legal” activities that fail to achieve their intended outcome, while violations are commonly defined as behavior that represents the willful disregard for the rules and regulations. It is within these two overarch-ing categories that The Human Factors Analysis and Classification System (HFACS) describes three types of errors (decision, skill-based, and perceptual) and two types of violations (routine and exceptional) [1].

Linguistic misunderstanding appears in most cases as a result of skill-based errors (in that part which concerns skills comprising language competence) which occur with little or no conscious thought, especially when there is not enough automatism, automatic performance, i.e. the performance of language skills and actions without conscious thought or intention, absolute perfectness arrived at by a frequent reiteration and training. Decision errors and perceptual errors can directly or indirectly influence the speech of communicants and reflect themselves in understanding failures, incorrect responding, misjudging information, etc. As to violations, among which two distinct forms have been identified based on their etiology - routine violations (habitual by nature) and exceptional violations (not typical of the individual) – language errors may belong to both.

Such substandard condition as physical and/or mental limitations of the operator, when necessary sensory information is either unavailable, or if available, individuals simply do not have the aptitude, skill, or time to safely deal with it, can also cause language errors, especially when a situation requires such rapid mental processing or reaction time that the time allotted to remedy the problem exceeds human limits and when an individual simply may not possess the necessary aptitude, physical ability, or proficiency (including language proficiency) to operate safely.

International cooperation in different branches of science, production, transport, aviation including, stresses the needs to solve the problems of standardization of not only scientific and technical terminology but also of special sublanguages. Thus, ICAO member-states, aspiring to the achievement of uniformity in organization of air traffic, develop rules and phraseology of radio exchange on the basis of the requirements produced by this international organization.

The standard phraseology of radio exchange is determined by certain documents of ICAO for providing aircraft flights and, although there are situations for which it is impossible to pick up exact phraseology, standard phraseology and procedures make up the basis for air communication system «pilot-controller». The less non-standard radio exchange phraseology is used, the higher the degree of the mutual understanding between the crew and the controller, and the bigger the probability, that a pilot and an air traffic controller will understand each other. Here, on the level of mastering the professional sublanguage of communications of air traffic controller and pilot (sublanguage of radio exchange) depend not only results of human actions but also life of communication participants as well. Air traffic controller, possessing complete information about what takes place in his sector, reports all necessary flight information to the pilot, and the safety of flight depends on the fact how the participants of air radio exchange understand each other.

Many efforts, in particular by linguists, were undertaken for the study of different descriptions of the sublanguage of radio exchange. For example, the classification of the radio exchange phraseology implies its division into three basic types [2]:

1. Schematic phraseology, in which a basic phrase can be complemented by the indicators of place, time, by conditional clauses etc.
2. Illustrative phraseology which embraces all possible lexical descriptions of different stages of flight performance.
3. Technological phraseology describing certain procedures of flight performance, the number of examples being limited and invariant.

The study of the rules of the radio exchange phraseology translation in connection with the Air Traffic Control procedures analysis and lexical and grammatical means, used in English and Russian phraseology, allows to distinguish four groups of translation equivalents according to the degree of relevance (ibid.) :

1. Complete analogues, when methods of expression of concepts and actions in two languages fully or almost fully coincide. Examples include «Ускорьте снижение» - «Expedite descent», «Разрешите запуск» - «Request start-up», etc. Complete analogues make no difficulty for translation.
2. Semantic analogues. Complete concept equivalence here is expressed by different language means. The meanings of phrases coincide, however, in different languages different grammatical forms are used, for example: «Разрешаю визуальный заход» - “Cleared for visual approach”, «Взлет в 25 минут» - “Airborne at 25”, «По локатору не наблюдаю» - “Negative radar contact”, «Борт наблюдаю» - “Traffic in sight”.

Semantic analogues do not present difficulty for translation, the only requirement is knowledge of the English phraseology of radio exchange.

3. Partial equivalents implying not linguistic but concept differences. «Взлет разрешаю» and «Cleared for take-off». This translation requires knowledge of not only the language and aviation profession but also ICAO documents.
4. Complete disparities. Complete disparities are practically untranslatable. And because of the requirements of laconic and brief forms usage, descriptive translation cannot be recommended. Therefore, it is necessary to use any opportunity to avoid using such forms.

In spite of a considerable number of works devoted to the problems of pilot-controller communication, some issues are not studied enough. Incompletely described remain some typology peculiarities inherent to the Russian and English radio exchange, some structural and syntactic and pragmalinguistic features of radio exchange utterances, their communicative-pragmatic aspect, the speech acts used in the dialogues of radio exchange [3].

Communicative behavior of utterance depends to a great extent on the sphere of its usage. A procedure of radio telephoning between the pilot of an aircraft and the air traffic controller is a very specific sphere of communication for which the following features are peculiar: exceptionally verbal form of performance, availability of only auditory channel of perception, dialogical character, dynamism, regularity and fixedness of both extra-lingual and speech situations.

The speech characteristics of the radio exchange between a pilot and a controller influence

directly the behavior and practical activities of a human, i.e. the pragmatic component of utterance prevails over all others (informing, emotional etc.). It in turn affects the requirements produced to speech of communication participants such as unambiguity, legibility, brevity, clearness and clarity.

It is logical to analyze the specific nature of radio exchange from the point of view of the theory of speech acts, thus including into the sphere of theory of pragmatics communicative intentions, psychological and behavioral reactions usually specific for the recipient during the communication process.

As is generally known, an illocutionary act, is considered as a speech act relating to the manifested aim and to a number of terms and conditions of its performance. The indication of illocution are expediency and conventionality. Within the framework of radio exchange it is possible to distinguish the following types of illocutionary acts :

1) representatives, e.g.: Maintaining 5000 meters; information G received; Reply missing, etc.;

2) directives (characteristic of controllers' speech and being the most vast group with the variant lexico-grammatical filling), e.g.: Stand by till further instructions; Report runway insight, etc.;

3) commissives (characteristic features of pilots' speech conditioned by the previous type), e.g.: Descend at 5 m/sec - > To descend at 5 m/sec; Will descend …, etc.;

4) declaratives (the determining quality of this class is that the performance of some act sets accordance between judgment content and reality), e.g.: I estimate to cross the border at 05; Unable to hold for 20 minutes, etc.

The illocutionary acts called 'expressives', although sometimes used, are not specific for radio exchange, and rather reflect the internal state of speakers, their emotions; they have no direct connections to the tasks of radio telephoning and even make it more difficult.

Having classified the basic types of speech acts in the process of radio exchange we can analyze their specific linguistic features. It is thus necessary to take into account the fact that it is in the radio exchange that an attempt to draw together illocution and perlocution is made, thus attaining the maximal speech effect of utterance that, in turn, affects safety of flights and life of people.

For all above-considered types of speech acts, an ellipse is characteristic. As a rule, explicit is only a rhematic part of an utterance. Also, there is a manifested tendency to the ellipse of components of grammatical structure (pronouns, auxiliary verbs, articles etc.), e.g.: I am descending — Descending.

Presuppositions and implications also cause the abridgement and shortening of utterances, e.g.: Cavok - > Clouds and visibility o'key; Squawk Ident; Request straight in (approach).

On the other hand, strict requirements to the unambiguity of utterance and its correct interpretation by an interlocutor (i.e. accordance between illocutive intentions and perlocutive force of utterance) caused the simplification of its phonetics in order to avoid mixing of two similar or identical sounds (e.g.: for - four [f o:], in radio exchange [f a u e r]); inflexibility of structural models and lexical limitation in some types of speech acts.

All restrictions are regulated by the special international bodies of civil aviation.

Utterances must be laconic, contain a minimum of words and a maximum of information.

Fixed and regulated are also patterns of speech responses in pilot–controller communication, especially models for information contained in controller's commands to pilots.

All rules and compulsory recommendations are equally binding for all members of air communication and correspond to the features of radio exchange as a functional style.

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I. Burlakova, Dr. Sc., Prof.
L. Verchulevska, Assoc. Prof.
T. Diachuk, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

THE ARRANGEMENT OF FORMAL LEVEL OF "AVIATION SECURITY" TERM FIELD – THE WAY TO COMMUNICATIVE CLARITY AND BREVITY OF AVIATION MESSAGES

The article analyzes some linguistic character shortcomings "aviation security" term field. It is determined that in order to improve the formal level of the studied term field it is worth to analyze every aviation term in respect of its compliance with the laws of the modern literary language, the criteria for normativity in general, and those requirements that take modern science brings to the terms as a special group of lexical items. Only under this condition air terminology will perform the role for which it was intended – to serve the most advanced form for expressing the aviation concepts and therefore aviation messages become brief and, most importantly, more accurate.

The language issue in aviation today is extremely relevant, but, unfortunately, almost unexplored, because for a long time the world community did not attach importance to the role of language in matters of aviation safety. Gradually, this attitude to the language changes, and various international organizations such as ICAO, are beginning to cooperate in the standardization of lexical items for the needs of the aircraft industry, because the misunderstandings that arise from incorrect interpretation of information, sometimes become the cause of litigation, damage, deterioration of the reputation and distrust of governments or airlines, and most importantly - to fatal consequences. The airborne recorder registrations analysis left no doubt about the extremely importance not so much of the technical reliability of the aircraft but the human and in particular the language factor in safety.

Taking into account the fact that the activities of those working in the field of aviation, is often associated with the limit and the lack of time, working under stress, are given the logical requirements for the candidate to confirm the "working" level of ICAO. One of them – is to communicate on common, concrete and work-related topics precisely and clearly [1. p. 5]. Thus, this authoritative international civil aviation organization emphasizes the importance of the quality of language as a form of representation of aviation communications.

The quality of professional speech depends on how effectively the codification of linguistic facts was carried out - a process by which lexical items are valued at their adequacy to the rules of the modern literary language, the criteria for normativity in general, and in consequence of which the rates are selected and fixed.

Professional dictionary of persons whose activities are related to aviation, includes conventional lexicon, professionalisms and, of course, terms - (from Lat. terminus "boundary line") - the special words and phrases that are precise designation of scientific concepts and require a definition to determine their meaning in the corresponding system of concepts. Since the terms arise as a consequence of the artificial human intervention in the natural development of language, they are considered to be the secondary, artificially created from the obtained or loan-words (or their morphemes). Conscious creation of the terms is not arbitrary, but is subject to certain requirements, conditioned by the modern science to the group of lexical items, in particular, the term must have a definition, be a system-defined at the level of forms and concepts, precise, unambiguous at least within its term system; short, stylistically neutral, euphonious and have no synonyms, easy to remember, have the ability to derivatives; focus on the concept that it calls.

In the aviation term system, and particularly in the "aviation security" term field, which is the subject of our review, some of these requirements, such as accuracy, uniqueness, brevity, are of fundamental importance, because life and safety of people depends on how accurate, concise and clear professional communication is. The purpose of the study is to identify some shortcomings of the lexical items of the term field caused by the discrepancy between the plan expression and the

plan of content of aviation terms, to suggest possible ways to eliminate these defects.

Factual material for the analysis are the lexemes selected from the scope of the operation, which form a complex picture of the concrete industry term application (mostly manuals and textbooks, monographs, articles). Here the terms are not deprived of paradigmatic events and behave like ordinary words and terminology – as the lexicon with all its laws of semantic development, however, in specific for terminology forms of expression. The sampling of the actual material compiles 400 lexical items.

The works by E.Wooster, J. Lotte, T, Kandelaki etc. are the theoretical basis of research.

Among the properties of the term, which determine its suitability for use in a particular system of terms, the researchers put the sign of accuracy to the first place, which is one of the means of achieving clarity of professional communication. By J. Lotte, the accuracy of the term implies the right or, in extreme cases, not distorted (neutral) lexical mapping of the features that characterize the concept termed [4, c. 5]. If the author used the word in one sense (and that corresponds exactly to his opinion), but the word has stepped up in the mind of the recipient's other components of the semantic structure (the addressee understood the word in another sense, too, but for sure - of the cognitive side), there is a situation that is a communicative error. Communicative inaccuracy is, in other words, the uncertainty [5, c. 212]. In the words of Hugo Schuchardt, "Terminological confusion for science is the same as the fog for navigation, it is dangerous" [4, c. 7].

One of the major shortcomings of term system, which causes inaccuracy in the perception of the terms and often leads to practical errors is ambiguity or polysemy, i.e. variation of the content, when the semantic structure of the term consists of a number of semantic units, or lexical-semantic variants, which are combined hierarchically [12, p. 32]. Among the polysemantic terms particularly harmful are those that operate within a single term system. Intra ambiguity is inherent to the terms, semantems of which both belong to several logical categories; action - the subject, action - the result of the action, action - the subject of the action, and others. This phenomenon in part can be eliminated by removing polyfunctional affixes. For example, one of the productive polyfunctional suffixes –entsi (ya), -tsi (ya) should be assigned to the names of objects (where possible), and for the names of the processes the traditional suffix –nn (ya) should be used: organizatsiya (the subject) -organizouvannya (process). For example, the term International Civil Aviation Organization (organizatsiya) the term organization refers to an object, thus the multi component term is formed correctly. However, the term office of the air traffic flow organization, the lexeme organization is appropriate to be replaced by organized (organizouvannya), as in this case we are talking about the process.

In addition to accuracy, the term is bound to make reasonable brevity. Longitude is the significant defect of terms, as the speech economy is broken, and therefore, savings of thinking. The speaker is unconsciously seeking to convey the essence with a fewer lexical items - a universal tendency to save the means of formal expression or "saving efforts" (by George Zipf) acts not only in terminology, but in general in the lexical-semantic system of any language in the world. That is why, in practice, as the researchers note, the requirement of brevity, often comes to the fore and is achieved by ignoring the requirement of precision: the facilities of technical maintenance are converted into facilities, restricted access area - restricted area, and others. There is a pattern: the more the concept (term) is used in the literature and daily practice, the more important property of brevity is. That is why the most attention in our study is paid to this quality of term units.

When the multi-component term falls into the communication, the speaker unconsciously is looking for ways to replace the cumbersome term for a short, easy-to use one – thus appears ellipsis, abbreviation. This is one of the ways of professionalism formation - non-standard, often emotive words and phrases, which name special, almost always concrete concepts of definite area of activity: pilots call aircraft "IL-2" as a hunchback, the trace that leaves a jet plane - sausage -zebra. Professionalisms operate in a conversational style, at an official level, in particular in scientific and business literature they should not be used because they can cause confusion in professional communication.

After analyzing 400 terminological units of "aviation security" term field, we found that 75 of them monostructure (18,75%), 325 (81.25%) have in its composition two (175, 43.75%), three (99; 24.75%), four (35, 8.75%), five (13, 3.25%), six (2, 0.5%), seven (1, 0.25%) words. Thus, the vast majority of lexical items (325 - 81.25%) consists of two or more words. In the study group of term

units we found a lot of cumbersome verbose entities whose structure is composed of four or more components: the air traffic control system, a security restricted area, means of measuring non-destructive testing, acoustic band of acoustic waves, control the destruction of the body with a crack, expert method of determining the parameters, quality control system for fuel gas mixtures, the turbulence in the inner layers of the free atmosphere, anxiety due to the threat of explosion, a service organization of traffic flows, and others. Since these terms are inconvenient to the communicative acts, are semantically closed to their definition, they should be eliminated from the scope of the operation, beeing replaced by adequate meaning, but formally simple lexemes.

One of the most widely used methods of obtaining the necessary short term is what is called an ellipsis, or omission in the combined period of one or more elements. Contextual ellipsis, which has the character of the transmission of words whose meaning can be easily installed from the context, is typical to aviation terminology. One of the most frequently used types of ellipsis is when the component expressing attributive sign is omitted while re-transmission - the generic definition is replaced by the generic name. For example, if it is determined that it is an internal combustion engine, while the continued use of this species is replaced by the generic term engine. An example of ellipsis can be such paired terms as standards of airworthiness - fitness standards, the average speed along the path - the average speed, and others.

It should also be mentioned that in order to create a short term in practice, the transformation according to the ellipsis model applies even to the term definition. For example, the concept "hole for the measurement of static pressure" gets such a term as the static pressure hole. In this case, deliberate term formation is replaced by mechanical omission of a number of words in the definition which is wrong.

Short term creation technique applies the method of constructing new units basing not on the entire but the truncated bases or "truncated segments of the words in the synonymous phrase, reference component of which can be an entire, non-truncated word" [10, p. 175] i.e. abbreviations. For example, in the dictionary by N, Kirichenko and V. Loboda [3], we found 70 terms-abbreviations with the first component **air**-: airline - Air line, Airmail - air mail, air ticket - air ticket aviameteoservice - aviation weather service. In the "aviation security" term field there operate multi component terms, including in its structure the initial abbreviations: flight performance characteristic AS, AS parking lot, metrological support of the NC, the maximum amplitude of AE.

Today, researchers state the fact that activation of this process of innovation, primarily due to the influence of sociolinguistic factors - resulting the dramatic changes of the last two decades in the Ukraine, a large number of new concepts appeared, consequently, there appeared the need in their linguistic expression. In addition to non-linguistic, intra language factors also impact the activation of this process, because, in contrast to the simple units complex terms have the ability to "express the two ideas in one word," and contain "the highest degree of concepts specificity" [11, c. 109]. Drawing up a few basics (words) in one semantically fusion unit allows characterizing the concepts and realities on several indications. Unlike the combinations, complex terms inherent in the formal and semantic unity.

Sometimes abbreviations lead to the formation of clearly curious, incomprehensible and unacceptable terms. For example, a radio station turns into transmitter, aero floating reagent - in Aeroflot. Abbreviate method is fraught with great danger - often causes confusion and technical errors. Use should be subject to the measures, linguistic flair and terminology sense. In particular, it should be kept in mind that the abbreviation should not become polysemantic. For example, the abbreviation air from airplane leads to ambiguity, because it means something to the ratio of air (gas).

The practice of Ukrainian term formation has an experience of short terms creation. For example, in the early twentieth century a number of one-word terms were formed to replace the Russian phrases: Blower unit - the unit blower, blower, duplicating machine - an apparatus multiplier, multiplier, and others. For comparison - the example from the socio-economic terms: a member of the cooperative - a cooperative shareholder, shareholder, a member of the partnership - confederate, persons enjoying the benefits - benefit recipients. A tendency to modification of single-word terms was positive, as it facilitated the rationalization of scientific speech.

It should be noted that the new formations scare away by their uniqueness and novelty. In this regard, we want to update the view of the outstanding Ukrainian scientist-encyclopedist of the twentieth century I. Ogienko who urged not to be afraid of neologisms, especially those that are

deliberately created at the request of life: "The true writer, worrying about the beauty of his language, uses a lot of uncommon words, bold and both hands creating wonderful new formations. It does not matter that these novelties are not all applied in our literary language – new formations, too ambitious and successful, always raise our creative spirit and encourage further work [7, p.60], "Do not forget that worst term does not cause a contempt, when get used to it "[8, p.189].

One of the major drawbacks of the terms on the formal level is also considered to be the inclusion of the service particles (above, below, by, for and so on [4, p, 12]. In a sample of the actual material, we found a lot of terms: turbulence in the interior layers of free atmosphere, anxiety due to the threat of explosion, a person without the right to enter, measuring the load on the fatigue, the defect to be reported.

We have found formal options, i.e. tangible items that are identical in terms of "conceptual core" in the term field studied [6, p.14]; transport security – security at the transport - the safety of transport. It is recommended to avoid the variance in the terminology – it is consciously undesirable here [2, p. 189]. The issue of choosing the most appropriate and sustainable option which should correspond not only the linguistic requirements, but the main trends of term lexics and term formation development is of extreme importance in this aspect.

To sum up, it should be emphasized that the operation of any term should be scientifically justified. In aviation terminology, the development should not only involve experts in a particular subject area of aviation knowledge, but also linguists. Only under this condition, the terminology will perform the role for which it is intended - to serve the most perfect form of expression for the aviation concepts.

Memorizing and mastering excessively long terms, inaccurate terms, which are uncomfortably pronounced, synonymous terms requires extra time. These defects extremely complicate the use of scientific, educational and reference books, often lead to the fact that people who use aviation terminology create misconceptions about the concept and reality, force the authors to the individual term formation overwhelmingly unreasonable which is further more confusing terminology (abbreviated forms of terms which seem right and comfortable only at first glance are created). The problem of aviation terminology arrangement can be solved only through a comprehensive study of the concept history of origin and development, realities and their designations. Modeling, legalization of aviation terms in field of fixation (dictionaries, collections of recommended terms, the state standards for specific industry terminology) should be based on the study of semantic relations that really exist and are observed in the functioning field of this terminology.

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T. Vakulenko, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

LANGUAGE PROFICIENCY REQUIREMENTS AND AVIATION SAFETY

The article dwells upon linguistic aspects of aviation safety. The substantial communication issues, arising between pilots and air traffic controllers during takeoff, flight navigation and landing were analyzed. Problem areas include linguistic (accent, ambiguous and non-standard phraseology), paralinguistic (voice intonation, intelligibility of speech, stress, rate of delivery) and pragmatic (context, expectations), factors. The article also deals with the measures taken by ICAO to improve language proficiency for pilots and air traffic controllers.

English is the official language of aviation. Many flight crews are now composed of non-native English speaking pilots from different countries. This situation, combined with the fact that many controllers are non-native speakers, can lead to substantial communication issues that can affect flight safety. Even when both pilots and controllers speak English fluently, there are pitfalls in the nature of the language and the way that language is heard that can affect safety. Besides, within English some words have dual meanings and can easily be misunderstood.

The English of international aviation is not English for general purpose, it is the language for specific purposes, much of which can be classified as a code, known as standard phraseology. This standard phraseology is at the core of the radiotelephony communication, which takes place between pilots and air traffic controllers. Radiotelephonic communication is used almost exclusively for air-ground communication, to direct, inform, question, request, and respond, where the air traffic controller directs and controls pilots. The focus of the communication is aircraft takeoff and landing, flight navigation, and so on, and the channel used is spoken, via radiotelephony.

Although the acoustic quality of radiotelephony is often poor, routine air-ground communications are typically smooth and effortless. Misunderstandings are infrequent and in general, they are easily resolved. This is largely because, over the years, standard phraseology has developed as an internationally recognized code. This has been refined in part as a result of the analysis of aviation incidents involving miscommunication, whereby ambiguities and confusions have been reduced to a minimum. This restricted code is used in highly predictable circumstances, and normal communications follow a prescribed sequence.

The controller, who is already in possession of the flight plan details of this aircraft, is expecting the call. In addition, the call follows a well-established script for such messages – that is to say, a greeting, followed by the current flight parameters (flight level and route). Each individual message turns up in a predetermined slot at a point in the sequence when the controller is expecting to hear it. In addition, sentences are extremely short (and correspondingly easy to process), while the words used belong to a very limited lexical set jointly determined by prescribed phraseology and operational practice.

Unfortunately, even in such predictable and restricted circumstances, miscommunications can and do occur, as a result of a number of factors. These can include pilots not realizing a communication is intended for them, interference on the radio frequency, overlapping calls, misunderstood flight parameters, incorrect readbacks, inadequate clarification of flight parameters, and so on (see Cushing 1994). An obvious cause of misunderstanding of phraseology can be miscomprehension of pronunciation by one of the interlocutors, particularly if one or the other or both have a regional or non-native accent in English. Major studies related to pilot-controller communication errors have been based on the analysis of confidential reports from the Aviation Safety Reporting System database. Grayson and Billings (1981) analyzed more than 5,000 confidential reports and identified 10 categories of pilot-controller communication problems. Two of the categories – misinterpretation (phonetic similarity) and ambiguous phraseology (more then

one meaning) – are directly related to linguistic issues.

In 2005 Eurocontrol organized a reporting campaign for European airlines and air navigation service providers. This campaign used a survey of airline pilots and air traffic controllers in Europe to assess communication problems. The survey revealed a large number of reported occurrences of air-ground communication problems in Europe between March, 2004 and April, 2005. Reported problem areas included linguistic (accent, ambiguous and non-standard phraseology), paralinguistic (voice intonation, stress, rate of delivery) and pragmatic (context, expectations), factors.

Grayson and Billings (1981) found that many pilot-controller misunderstandings can be attributed to expectations that lead the listener to hear what he or she was expecting to hear instead of what was actually said.

Although speaking a common language is essential, pilots and controllers must also share the same context. One example of the impact of having different contexts occurred when a controller, noticing on his radar a decrease in altitude for a flight, radioed the flight crew, "How are things coming along up there?" in reference to the decreasing altitude. However, the crew had been preoccupied with a nose gear problem and had informed several controllers, but not the current one, about the issue during their flight. The crew responded "OK" to the controller's questions. The crew, unaware of the altitude problems, was referring to the nose gear problem it had just managed to fix. The controller interpreted OK as referring to the altitude problem. The aircraft subsequently crashed. In this example, the accident may have been avoided if the expectations of the controller and the crew had been more aligned.

Another reason of miscommunication between pilot and controller may be code switching. It can occur even between native English speakers and often involves switching between technical jargon and spoken English. This can lead to problems when the same word has different meanings in the technical and common language. In one particular accident, a flight was cleared to land at the same time another flight was cleared to taxi into position for takeoff. The controller told the in-air flight to go around, but the captain asked for the permission to continue landing and inadvertently used the word "hold" to express his request while speaking to his first officer. Specifically, the pilot said "can we hold? Ask him if we can hold." In aviation jargon, "hold" always means to "stop what you are doing," but in ordinary English it means to continue on the same course. The controller agreed for the flight to "hold" intending for it to go around, but the flight continued with the landing and collided with the aircraft on the ground.

Paralinguistic factors such as speech rate, voice intonation, stress can negatively affect communication. When under stress or in complex situations, speech becomes more rapid and frequent and can make communications very difficult to understand. Under these stressful conditions, changes in voice pitch can cause "slips of the tongue" that can lead to misunderstandings and errors.

Homonyms (homophones and homographs) can also lead to miscommunication since words that sound or look alike may have different meaning. An example of a communication error involving a homophone is: ATC cleared an aircraft for descent to “two four zero zero”. The pilot read back, “Ok”. Four zero zero”. The aircraft then descended to 400 feet instead of 2400 feet. The pilot mistook the number “two” to mean “to” and descended accordingly.

Intelligibility of speech is another problem. Flight crews need to be aware that non-native English speakers often cannot distinguish between certain sounds and therefore may not understand a communication. The ICAO language proficiency requirements apply to native and non-native speakers alike. The intelligibility of non-native speakers depends on the extent to which their languages share phonological and grammatical features with English. There are many instances where distinct sounds in one language are interpreted as being the same by foreigners. For example Japanese speakers have difficulty detecting the difference between "R" and "L" sounds in English, and Dutch and Spanish speakers have trouble differentiating “S” and "SH." Native speakers of these languages must make a special effort to learn to differentiate between these sounds. Therefore, according to ICAO, native English speakers must familiarize themselves with the dangers of cross-cultural communications. Meanwhile, as research using conversation analysis to examine cockpit

conversation has shown, even native speakers of English are not necessarily immune from poor communication, even in routine communication.

Aviation jargon can also lead to ambiguity. In the United States, more than 300 runway incursions occur annually. Such a large number of runway incursions indicates that even native English speaking pilots are having trouble communicating with native English speaking controllers. Aviation jargon is one of the biggest contributors to runway incursions because of its complexity and often overlapping or ambiguous use of numbers.

The numbers used in pilot-controller communications are used to indicate multiple aviation parameters (e.g., flight level, heading, air speed, airline flight number). The overlapping number ranges can lead to misunderstandings, especially in high workload or time-pressured situations. A common mistake occurs when changing heading or flight level. For example, when an aircraft is flying on a heading of 300 degrees at FL 270 the controller vectors the aircraft to "three one zero"; the pilot acknowledges "three one zero" and climbs to FL310 instead of turning to a course of 310 degrees. The pilot simply interpreted the request for a heading change as a flight level change command.

Serious miscommunication can occur in emergencies, where one of the interlocutors may be under severe emotional stress. Prescribed procedures exist for emergency calls also, such that the first element of the call should be a distress signal, and the message should be composed of a number of specified elements, including the name of the ground station being called, the aircraft identifier, the nature of the problem, the pilots intention, and the flight parameters of the aircraft. But in emergency circumstances participants may fail to use phraseology and have recourse to what is known as plain language.

Data obtained from the ICAO accident/incident reporting (ADREP) system show that the role of language in accidents and incidents is significant. Since the mid - 1970s there have been over 1,500 fatalities worldwide in which “language barrier” was identified as a possible contributing factor.

There are a number of well-documented cases where serious fatal accidents have occurred, where a lack of adequate communication between aviation personnel from different linguistic backgrounds has been a significant contributing factor. The worst disaster in aviation history occurred at Tenente airport in March 1977, when a KLM Boeing 747 collided on take-off during foggy conditions with a Pan Am Boeing 747 that was still taxiing up the same runway and had not yet cleared that runway. In this crash, which involved misunderstanding of the phrase “at takeoff” 583 people lost their lives. The failure of the senior Dutch pilot of the KLM to recognize that messages between the English-speaking pilot of the Pan Am aircraft and the Spanish air traffic controller indicated that the runway was not yet clear.

Avianca Flight 052 crashed in April 1991 at Cove Neck, New York, en route from Bogota Colombia to JFK New York. The probable cause of the accident was the failure of the crew to adequately manage the airplane’s fuel load, and their failure to communicate an emergency fuel situation to the air traffic control before the fuel exhaustion occurred.

In 1995, an American Airlines Boeing 757 approaching Cali, Columbia, turned off course, crashed into a mountain and killed all on board. The air traffic controller later told investigators that the flight crew failed to correctly report their flight parameters, but he did not know how to convey his concern to the crew in English.

In November 1996, a Kazakhstan Airline plane collided midair with a Saudi Arabian Boeing 747 over Charkhi Dadri, New Delhi, India, killing 351 people. The air traffic controller was Indian, and the pilots were Saudi and Russian.

All these disasters have one thing in common: a contributing role in the chain of events leading to the accidents played insufficient English language proficiency on the part of the flight crew or a controller.

Recent research focusing on cross-cultural communication and misunderstandings also shows that a lack of linguistic proficiency may combine with cultural differences to cause miscommunication in aviation settings. This may be especially problematic with multicultural

cockpit crews, where variables like silence, repair, turn-taking, and overlapping talk, which conversation analysis has shown to indicate problems of communication, may be very differently interpreted in different cultures, particularly in combination with differences in status or authority of participants, potentially giving rise to miscommunication. Clearly, the importance of proficiency in English in aviation communication cannot, and should not, be underestimated.

Early aviation communication specialists considered that successful communication between pilot and controller, would be achieved once a radiotelephony phraseologies based on simplified English had been developed. But experience has shown that phraseologies alone are not sufficient to cover all of the potential situations that can arise in urgent or emergency cases. That is why besides the use of ICAO phraseologies, proficiency in common language is critical for safe radiotelephony communications.

Where the circumstances are unpredictable, where speed and clarity of communication are of the essence, and where accuracy of comprehension by both parties is crucial, the demands on the language proficiency of aircrew and air traffic controllers can be extreme. This is obviously a concern where one or more of the participants may not be a native speaker of English.

The importance of the role of language proficiency in aviation safety has led ICAO to revise the provisions related to the use of language for radiotelephone communications. The amended language proficiency requirements for pilots and air traffic controllers provide a new set of standards. The fundamental aspects of language use in radiotelephone communications are: the correct use of ICAO phraseologies and proficiency in common language.

In 2004 the ICAO published a set of Language Proficiency Requirements and a Proficiency Rating Scale and by 5 March 2008, air traffic controllers and pilots were required by the ICAO to have a certificate attesting to their proficiency in the language used for international aeronautical communication.

Language Proficiency Requirements set minimum standards for language proficiency for pilots and air traffic controllers and refers to an ICAO language proficiency Scale, which is to be used both as the basis for test construction and for the rating of language proficiency. The ICAO Language Proficiency Rating Scale consists of six levels of skill in six areas of language use:

pronunciation, structure (relevant grammatical structures and sentence patterns), vocabulary, fluency, comprehension, and interactions.

Language is much more complex than the use of it in our daily lives. A lot of common ideas about language use and language learning may be faulty. An example is a common perception that anyone who speaks any foreign language well can also teach that language. Another faulty approach results in learners searching for the so-called “new methods for quick and easy language learning”. But it is commonly known that language teaching is a professional activity that requires specialized training, and no substitute for effort and time has been found in the learning of new languages.

Aviation English must be seen in the overall context of English for specific purposes (ESP), as it shares the important elements of needs analysis, syllabus design, course design, and materials selection and development which are common to all fields of work in ESP. However, aviation English differs from other varieties of ESP in that it is often a mix of specific aviation content and general content, relating to general ability to communicate more effectively.

Aviation English training requires instructors who have an educational background specifically in English language teaching and familiarized themselves with the aviation content. They can do it either by taking part in aviation operations, or through a short course (for example, a pilot school course). With an introduction to aviation content, experienced teachers of English for specific purposes should be able to select, modify and exploit appropriate content for the benefit of their students. On the other hand, a qualified English language teacher may be paired with an aviation subject matter expert (SME). The SME will guide the selection and verify the accuracy of the aviation content, while the trained language specialist will arrange for optimal language in the context of the aviation content.

Experience has shown that language learning is most effective when learners are engaged in communicative language activities. Individuals with flight experience or an ATC background make

valuable subject matter experts, but the task of teaching language classes or developing appropriate language learning materials should be delegated to qualified teaching professionals.

Attempts to economize in teacher and material are likely to cost more in the long run than selecting people who are appropriately qualified in these areas.

Conclusion

English of international aviation can be classified as a code, known as standard phraseology, which is at the core of the radiotelephone communication, taking place between pilots and air traffic controllers during aircraft takeoff, flight navigation and landing. Obvious causes of pilot-controller miscommunication include linguistic (accent, ambiguous and non-standard phraseology), paralinguistic (voice intonation, intelligibility of speech, stress, rate of delivery) and pragmatic (context, expectations) ones. Though a radiotelephone phraseology is important for successful communication between pilot and controller, it is still not sufficient to cover all of the potential situations that can arise in urgent or emergency cases. That is why the demands on the language proficiency of aircrew and air traffic controllers cannot and should not be underestimated.

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O. Zubrytska, Senior lecturer
T. Bolotna, Senior lecturer
(National Aviation University, Ukraine)

LANGUAGE INFLUENCE ON FLIGHT SAFETY AND EFFICIENCY

The article deals with issues concerning the influence of the English language used by pilots and air traffic personnel on flight safety and efficiency. Much attention is paid to the language proficiency requirements established by ICAO. The authors analyze considerable difficulties in implementing the language proficiency encountered by some Contracting States and offer the ways of their overcoming.

In accordance with the resolutions of the 37th session of ICAO Assembly held in Montreal from September, 28 to October,8 2010 the Resolution A 37-10 "Proficiency in the English language used for radiotelephony communications" was adopted. Although the Contracting States have made substantial efforts to comply with the language proficiency requirements some states encounter considerable difficulties in implementing the above-mentioned requirements. Taking into account all these facts, the Assembly:

1) urges the Contracting States to use ICAO standardized phraseology in all situation for which it has been specified;

2) directs the ICAO Council to continue to support Contracting States in their implementation of the language proficiency requirements;

3) urges Contracting States to assist each other in their implementation of the language proficiency requirements;

4) urges Contracting States that have not complied with the language proficiency requirements by 5 March 2011 to continue to provide ICAO with regularly updated implementation plans including progress achieved in meeting their timelines for full compliance;

5) urges Contracting States after 5 March, 2011 to take a flexible approach towards States not meeting the language proficiency requirements, but trying to make progress according to their implementation plans. Decisions concerning flights should be made on a non-discriminatory basis and not be made for the purpose of gaining economic advantage;

6) directs the ICAO Council to monitor the status of implementation of the language proficiency requirements and take necessary actions to advance safety and maintain the regularity of international civil aviation;

7) requests the ICAO Council to submit to the next ordinary session of the Assembly (September 2013) a report regarding the implementation of the ICAO language proficiency requirements;

8) Urges Contracting states that have not complied with the language proficiency requirements by the applicability date to post their language proficiency implementation plans including their interim measures to mitigate risk, as required, for pilots, air traffic controllers and aeronautical station operators involved in international operations on the ICAO website as outlined in accordance with the associated practices below and ICAO guidance material;

9) Urges Contracting States to waive the permission requirement under Article 40 of the Convention, in the airspace under their jurisdiction for pilots who do not yet meet the ICAO language proficiency requirements, for a period not exceeding three years after the applicability date, provided that the States which issued or rendered valid the licenses have made their implementation plans available to all other Contracting States and have notified ICAO of the differences pertaining to language provisions;

10)Urges Contracting States not to restrict their operators, conducting commercial or general aviation operations, from entering the airspace under the jurisdiction or responsibility of other States where air traffic controllers or radio station operators do not meet the language proficiency requirements for a period not exceeding three years after the applicability date, provided that the

States which issued or rendered valid the licenses have made their implementation plans available to all other Contracting States and have notified ICAO of the differences pertaining to language provision.

Contracting States that did not meet the language proficiency requirements should:

a) develop implementation plans for the language proficiency requirements that include the following:

- a timetable for adoption of the language proficiency requirements in their national regulations;
- a timetable for establishment of language training and assessment capabilities;
- a timetable of full implementation of the language proficiency requirements;
- appointment of national coordinator responsible for implementation of the language proficiency requirements.

b) place these plans on the website of ICAO and update them regularly until full implementation;

c) notify ICAO of differences with Standards and Recommended Practices regarding ICAO language proficiency;

In accordance with the article 40 of the Convention on international civil aviation neither aircraft nor crew member having records of non-compliance with international standards may participate in international navigation without permission of the state whose territory is entered.

The main issues of regulation that have significant influence on knowledge and use of the English language in the civil aviation are:

a) application of International Standards and Recommended Practices;

b) status of the English as the language of aviation in national regulations.

It is well-known that for some reasons – historical, cultural and political language proficiency level is different in different countries. Therefore, determination of minimum level of language proficiency for radiotelephony communications is of great importance.

With purpose to prevent accidents ICAO introduced language provisions to ensure that air traffic personnel and pilots are proficient in conducting and comprehending radiotelephony communications in the English language.

Political and cultural reasons may be obstacles in using English in air space. In some states the use of English is not regulated by national provisions, or national language has the same priority with English that may lead to various problems. With purpose to ensure flight safety and efficiency ICAO supports national practice of using English as the only language during international operations.

In accordance with ICAO requirements the English language shall be available on request at all stations on the ground serving designated airports and routes used by international services.

Practice shows that different states have different requirements to the English language proficiency by pilots and air traffic personnel. It is necessary to standardize national requirements to the language proficiency by applicants before entrance examinations for the specialty “pilot” and “air traffic controller”. This requirement will allow to improve the quality of education and provide higher level of the language proficiency at the final stage.

International practice shows that pilots and air traffic personnel have different level of the language proficiency that may affect efficiency, capacity and flight safety.

Pilots have a clear idea concerning the level of English used by air traffic controllers all over the world as they fly every day. According to the pilots the language problem is global and common everywhere and concerns both radiotelephone phraseology and general English.

The most common language problems are the following:

- the use of spoken general English for lack of ICAO phraseology; and
- the use of two languages on the same frequency that may lead to the situation when pilots are not aware of other aircraft’s location.

Ignorance of ICAO phraseology and the spoken general English instead is a common problem among pilots and air traffic controllers, including native speakers. In general, the main problems for

those who use English as a foreign language are lack of phraseology, poor knowledge of English and bad pronunciation. Native speakers often use nonstandard phraseology and local language.

In reality poor knowledge of English or simultaneous use of two languages may result in incidents and serious accidents (such as CFIT, failure of control system during the flight, fire on board, sabotage, air collision, hijacking, ice covering and snow-blocking, landing, wind shear, full fuel consumption, unauthorized use of runaway, unauthorized occupation of echelon, interrupted takeoff etc.)

Pilots' understanding of air situation and their active part in air traffic influence greatly on flight safety and efficiency. Use of two languages (this is a common thing worldwide) does not favor flight safety and efficiency. Under existing conditions pilots have no opportunities to take an active part in air traffic. Therefore, IATA supports any actions concerning use of the English language as a single one in air communication as it is the best solution that may ensure flight safety and efficiency.

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O. Kovalenko, Senior lecturer
(National Aviation University, Ukraine)

FORMATION OF COMMUNICATION SKILLS OF AVIATION SPECIALISTS

Culture of the professional communication is the basis of the professional activity. It is spoken about the process of formation of the professional communication culture, where communication, professionalism of the communication are foundation of it in personal oriented studying by means of creative technologies; examined about peculiarities, and defined conditions of formation of professional oral skills culture of future aviation specialists.

The efficiency of the educational process, we believe, depends on the psychological readiness of students to teaching and learning activities that include: understanding students learning goals, which stimulates their educational and cognitive activity, physiological and psychological availability to study, desire to learn and activity in the educational process, ability to focus on educational activities, appropriate level of development. Productive mastery of professional knowledge and integrative skills that are acquired in the learning process and skills formation are necessary to achieve the appropriate level of professional communication, in our opinion. Knowledge encourages people to work, which is a way of human being in the world.

English language study is especially important in the aviation university. Students of such university have to operate well as colloquial language as professional one. So, oral skills are the main problem in an ESP classes. Mastering of phonetics, lexical, grammar must be direct on its practical using in speaking.

Teaching must be organized to improve oral skills owing to other language activities such as reading, listening, speaking. For example, reading aloud improves speaking. Pronouncing words aloud students develop their language skills. It is important to create situation for the discussion on some topic that makes students to express their opinion. Owing to the discussion students don't frighten to speak.

Students enter the technical university to master some professional skills, and don't take into account English language skills. Thus they have to read, translate the information understand some particularities and discuss problems on their occupation.

Explaining new material, complex instructions the teachers have to use as English language as native one. One of the important communicative exercises for improving oral skills is a dialogue. Students have to make and express their opinions, their answers to questions. The answers to the question are one kind of the dialogue speech. There is other kind of the dialogue speech: making dialogue. It helps students to create their thoughts, expressions, listen to each other, discuss. The task of the dialogue speech in the aviation university is to make dialogues, using special terms. During making dialogues students have to greet, answer to greeting, congratulate, express wishes and respond to them, express thanks, put questions, answer to them, change by reports, opinions.

Monologues speech gives possibilities students to master such kinds of monologues as report, story, description, and characteristics. Giving the information in their reports, students learn to connect sentences in the text. Making stories they explain their opinion, mark some subjects or events. Students use words or word combinations, which mean quality, when they describe a subject, a place, and phenomenon. They express their thoughts (to state thesis, to argue, to make a conclusion), giving characteristics.

Another most important component in the improving of students' oral skills is the teacher's patience. The teacher need not interrupt the students during the speaking correcting mistakes. It will be better to give a possibility to finish their speech and propose to the other students to correct mistakes, which were noted. If students missed some mistakes, the teacher may supplement them.

In the aviation university studying of the English language means the connection of the colloquial language and the professional one. Exercises must help to formulate thesis according to

some problems, to express the opinion, to discuss some problems, to argue the accuracy of the statement, make a conclusion. For example, one exercise (the reading, listening) may be aimed at finding out the main point. Other exercise may be pointed to find as the main point as author's conclusion. The next step is to express their statements to some problems. The exercise on making sentences by connecting words and word combinations, which are situated (positioned) into the incorrect order helps students to remember the word order in the English sentence and to form their expression correctly. Sometimes it is possible to give term's definitions, if they are not complex. Students develop their oral skills by explaining some terms in English.

Human activity is a foundation of every profession. So, the profession is a human activity within a profession. For an example, the activity of air traffic controllers is a professional foreign language communication, which is the exchange of information within their profession. Culture of professional communication of the future air traffic controllers is formed on the lessons of foreign languages. Accordingly, there is a problem of effective methods of teaching English in the aviation university. In recent years, a significant amount of teaching materials for language training for students, were developed but do not forget that professional air traffic controllers communication in English is a shortage of time: they have to carry out their activities constantly being under the influence of this factor. So, organizing educational and cognitive activities of students, we can use the following favorable aspects of the positive attitude of students to study: students are interested in scientific knowledge and the teacher creates a situation in which they admire, scientific knowledge, skills and abilities, is practically important for the student in different situations and therefore cause a positive attitude to them, training activity is the emotions, the desire to overcome difficulties, to try themselves at mastering the teaching material; appreciation of scientific knowledge in society motivates students studying, the collective nature of educational activity creates a favorable atmosphere and the desire to possess appropriate place among classmates, self-esteem is an important reason for a positive attitude to studying, success in education and fair evaluation of student achievement encouraged him to training activities and encourage positive student studying. Thus, learning depends on perception, comprehension and understanding, summarize, consolidate and apply in practice. The most important stage of perception is the first impression of the student of educational information that will remain in his mind. Students can achieve a full comprehension and understanding of educational material through analysis, synthesis, comparison, induction, deduction. Summarizing educational material, in our opinion, it is important to pay attention to critical features of objects, phenomena, processes, filter variants that discover the essential features of phenomena and concepts. In this case, abstraction that is the thinking process of selection of one specific item of evidence from numerous other features. An important role plays it can be positive (separation of the essential attributes) and negative (separation and rejection of non-essential features). So, full understanding and summarizing is possible, if it is based on sufficient scientific knowledge that ensures the widespread using of comparison, analogy and evidence. Consolidation of educational material depends on the quantity and quality of the material, emotional state of students. Repetition is effective when it is motivated, properly distributed in time, not a mechanical memorization. Applying knowledge and skills in practice can be implemented in a variety of exercises in different types of repetition (initial, ongoing, summarizing). Interdisciplinary connections, solving various problems in life, when you have to use complex knowledge from different subjects have particular importance, in our opinion, for the full application of knowledge in practice. However, the efficiency of studying depends on the motivation of learning and cognitive activity, emotional development of students, their independence and creativity. Strategy personality oriented training and creative technology is increasingly appeared in the higher technical education. The essence of creative psychology and pedagogical technology is the creative approach to solving the problem of pedagogical process in which the interests and value of personality are dominant components of studying. Moreover, innovations of this technology is that the instructor during training activities is not only a medium, the speaker of subject and disciplinary knowledge, but as an assistant in the establishment and development of student's personality, arguing this person regardless of his involvement in

knowledge.

Learning of foreign languages in the technical universities provides connection of spoken language with professionally oriented language. As a result, the students formed the ability to formulate a thesis concerning any matter, the ability to logically, consistently express their point of view, think about a given problem, arguing the accuracy of their statements, confirm them with examples, formulate conclusions and summarize information.

Mastering of professional communication does not guarantee high reliability and efficiency of staff in the workplace. Therefore, educational programs, which set requirements for specialists who deal with air traffic, are developed. Important issues are the criteria for selection of the staff, not only the dignity of the candidates in the technical sphere is determined, but also the social and personal aspects of individuals in the group are analyzed.

Data collected for the consideration of the central component can be divided into four categories: physical, physiological, psychological and psychosocial.

Physical factors are related to physical abilities and limitations of individuals. They include the basic physical (anthropometric) features of a person, physical condition, physical efforts, motor skills, vision, hearing and other sensations (feeling) that allow to establish whether individual is physically able to perform the task what physical defects or limitations prevented the successful implementation of tasks and how these physical and sensory limitations created difficulties affecting the task.

Physiological factors include the overall health of the individual as well as nutrition, disease, smoking, alcohol and drugs, impact of stress or faintness, and general lifestyle. These factors help to establish the physiological ability to complete the task, how it affected to the performance and decision as ability of the individual to fight stress, faintness or illness contributed to his actions, behavior.

Psychological factors determine what individuals bring in a working situation as a result of their acquired knowledge and experience and their mental abilities. These factors include professional training, knowledge, experience and skills in planning, perception and analysis of information, a measure of attention and level of workload, individual characteristics of the person, mental and emotional state, mood and attitudes. Considering professional training, knowledge, experience and skills of planning, these factors help determine whether the person's training, his knowledge and experience were sufficient in this situation, how the nature and novelty of the experience of training or knowledge affected the personality self-confidence, the ability to perform the required actions or level of perceived workload. Examining perception and analyze of an information, attention and level of workload it may be determined whether there was an incorrect perception of the problem, whether there were any illusions caused by the sight, or the vestibular system, or the flight conditions, or there were cases where the required degree of attention or volume of adapted information, exceeded the limit capacity of a person. Regarding the individual characteristics of a person, mental and emotional state, mood and attitude is determined by whether the individual is psychologically able to perform this task, what facts state about the relation of a person to the work, to others, to himself; how this attitude affected the motivation, quality of their work and professional mental ability, and how individual personal characteristics and mental state influenced the person's approach in this situation, how the personal ability to resolve stressful situation and respond to emergency circumstances influenced the change in the sequence of events.

Psychosocial factors associated with pressure on the person in the social system (the environment outside of work). These factors include events and stress (e.g. death in family or financial problems), and relationships with others (family members, friends and colleagues). Owing to these factors it can be determined whether they motivated a person to the approach in this situation and whether they affected his ability to resolve stressful situation or unforeseen circumstances, or worsened (increased) level of faintness of a person.

There are some correlations according to these factors.

Correlation "individual - individual" presents a relation between the individual and others at the workplace. The relationship between chief and subordinates are included in this relationship, as

corporative esprit and operational load in a company can substantially influence to the actions of a man, the presence or absence of verbal or nonverbal communication that can cause execution sequence of actions in the incorrect form, working conditions, the experience and knowledge of workers.

Correlation "individual - equipment" is a relation between man and machine (switches, controls, displays, locating devices), which suggests the role of information processing, structure and grouping during reacting, consistent actions work loading.

Correlation "individual - procedures" reflects the relationship between a man and supporting systems that are at workplace: the impact of automation on the person's activity at his work loading, work conditions, attitude to the work, and consistency in the terminology, the content and the format of documents that were used.

Correlation "individual - surroundings" shows the relationship between a man and internal and external surroundings. The internal surroundings are directly workplace, including temperature, pressure within the internal surroundings, lighting, and background noise and air quality. The external surroundings is as a physical environment outside the workplace and as in the broader sense of political and economic constraints in an aviation system's conditions (weather, weather briefing, the nature of the earth's surface (area), physical facilities and equipment of the station flights infrastructure (air traffic control equipment, its type, and its using) and the economic situation).

Thus, base of profession of air traffic controllers is the communication, which has a special particularity inherent to this profession. In the broadcast it is necessary to use standard phraseology that is set to provide appropriate guidelines, permits, guidance and information. Deviations from standard phraseology in carrying out the procedures can cause misunderstanding that as a result can lead to aviation disasters. Therefore, air traffic controllers have to provide a clear and satisfactory reception of messages and pronounce each word distinctly and clearly, keep the volume at a constant level of speech. For messaging air traffic controller must use ordinary spoken language or standard phrases without changing the content of the message. It is necessary to prevent useless broadcasts at a time when the control tower is prepared to answer the previous call.

Conclusions. So improving oral skills in an ESP class is the main task of teachers, because the future aviation specialists have to speak English, using special terms: to discuss problems, to characterize the subject, to analysis and comment on other's statements. Professional communication of air traffic controllers is a formal communication in which there is the information exchange on the basis of individual principles of the professional communication. Culture of professional communication of the future air traffic controllers is formed on the lessons of foreign languages.

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L. Konoplianyk, PhD, Senior lecturer
(National Aviation University, Ukraine)

COMMUNICATIVE APPROACH TO TEACHING ESP FOR FUTURE AVIATION ENGINEERS

The article analyses modern requirements for aviation specialists that initiate the search for approaches, methods and techniques in teaching ESP for them. A communicative approach is considered as an optimal language teaching means. The article also gives examples of communicative activities that can be used during the teaching process. These activities provide opportunities for future aviation engineers to be engaged in real-life professional communication in English.

Modern democratic transformations in Ukraine, its integration with European countries, intensive development of information technologies, broadening political, economic and cultural relations with other countries have caused the significant increase in requirements to the level and quality of future specialists' training. The professional training of specialists is determined by individual requirements of the labor market and characteristics of a profession. Civil aviation is one of the industries with special conditions of production activities, determining the specific character of future aviation specialists' training. These conditions arise from such circumstances as increased responsibility for the results of work, strict requirements for professional knowledge and skills, and high responsibility in making decisions. Due to technological progress in aviation, growth of competitiveness of aviation companies, enhancing international cooperation, the demand for highly skilled professionals, ready for productive communication, is increasing. Correspondingly, the entire system of such specialists' training is designed to ensure reliability and competence of graduates.

Since Ukraine is training aviation specialists who are competitive in the global market, their training is carried out in accordance with the standards developed by international organizations, such as: the International Civil Aviation Organization (ICAO), the European Organisation for the Safety of Air Navigation (Eurocontrol) and the European Aviation Safety Agency (EASA). The Part-66 of Commission Regulation (EC) 2042/2003 of 20/11/2003 on the continuing airworthiness of aircraft and aeronautical products, parts and appliances, and on the approval of organisations and personnel involved in these tasks, adopted by EASA, clearly defined requirements for knowledge of aircraft maintenance engineers of A, B1, B2, C categories [5, P. 75–315].

In order to improve flight safety, ICAO has established English language proficiency requirements (LPRs) for all pilots operating on international routes and all air traffic controllers who communicate with foreign pilots (Doc 9835). These standards require pilots and air traffic controllers to be able to communicate proficiently using both ICAO phraseology and plain English. In order to conform to ICAO Language Proficiency requirements, pilots, air traffic controllers and all others who use English in R/T communication on international routes must be at ICAO English Language Level 4 (Operational) or above [9].

The problem of future aviation specialists' training was investigated by many researchers who were developing requirements for aviation specialists in ICAO. Among Ukrainian researchers are Ye. Kmit, T. Tarnavska, V. Piven, G. Paschenko, S. Tymchenko, I. Fainmann et al. However, their works are related to air traffic controllers and pilots, and the problem of aviation engineers' training has not been studied in details. Although today aviation engineers do not belong to the list of professionals with the required fourth level of proficiency (by ICAO), the current conditions of European integration processes increase the requirements for knowledge of aviation English by engineers to use it for professional needs. The factors influencing the requirements are as follows: Ukrainian transportation system is on its way to European integration, Ukrainian airlines operate some aircraft of foreign manufacture (including Boeing 737, Boeing 767) along with locally produced aircraft An-24, An-26, An-32, An-30, An-140 etc, engineers are involved in joint projects

with foreign countries. Furthermore, based on the analysis of job descriptions and educational-qualification characteristics of aviation engineers and EASA requirements, the foreign language is becoming important today for their professional development, creation of joint projects of aircraft equipment with foreign counterparts, maintenance of aeronautical equipment with instructions in English, inspection of aircraft, keeping technical documentation and analysis of the influence of different factors on the condition of an aircraft, its systems and functional characteristics, opportunities to get a job in international aviation companies, train abroad in order to study the experience of other countries, professional interaction with foreign colleagues.

Nowadays English for Special Purposes (ESP) for aviation engineers needs special attention and more detailed studies. The main point is to guarantee the quality of higher education and future aviation engineers' proficiency in aviation English that promote mobility and more opportunities for employment, efficient international communication and access to information. The process of European integration requires a high level of foreign language competence, which is especially necessary for the realization of professional activity and mobility of future specialists. Our society needs aviation specialists able to behave correspondingly in different communicative situations, choose adequate communicative means, perceive and analyze the information actively, be logical, clear and persuasive while expressing their views, establish and maintain interpersonal business contacts and organize cooperation with foreign colleagues. That's why the problem of communication skills of future aviation engineers is becoming especially important.

Thus, the ever-growing need for aviation specialists with proficiency in profession-oriented English results in improving teaching ESP (it is aviation English in our case). It requires the involvement of different methods to develop students' communication skills. In our opinion, a communicative approach is one of the ways to improve teaching ESP, because the main goal of teaching ESP is using the language not only as an informative tool, but also as a means of communication in profession-oriented communicative situations. Communication-oriented learning involves the formation of students' communicative competence, i.e. ability to use English in different situations.

Many researchers were and are still investingating communicative training of professionals: development of communication skills (O. Bobrov, N. Butenko, N. Volkova, V. Kan-Kalyk, L. Leontiev, A. Mudryk, L. Savenkova et al.), communicative competence (L. Petrovska, E. Rudensky et al.). R. Makarov and V. Ponomarenko pointed out the importance of communication skills for aviation specialists, stating that communication skills are significant professional qualities. Unfortunately, the formation of communication skills is not always carried out during the process of aviation specialists' training.

Modern scholars identify communication skills as a set of actions that are based on theoretical and practical training that enables to use communication skills creatively to reflect and transform reality [1]. Communication skills are necessary for future aviation engineers for full-fledged and effective communication. That's why communication is a prerequisite for professional development of an aviation engineer.

O. Leontiev, V. Kan-Kalyk, A. Mudryk identify certain communication skills necessary for professional communication.

O. Leontiev considers language communication, understanding a collocutor and communicative tasks, establishment of the contact to be professional communication skills [2].

V. Kan-Kalyk gives the following list of professional communication skills: ability to communicate in public, ability to organize joint activities, communicate purposefully and manage this process [3].

A. Mudryk offers the following list of communication skills: ability to transfer knowledge and skills, variations of solutions, methods of communication that are already known into a new communicative situation; ability to find solutions for a new communicative situation; ability to create new ways of solving a particular communicative situation [3].

The purpose of teaching ESP for future aviation engineers' at higher educational institutions is the formation of their professional communicative competence by developing and improving

reading, speaking, writing and listening comprehension. However, it is very difficult to achieve this purpose in a limited number of hours for teaching ESP at higher technical educational institutions. Instructors have to take into account the lack of knowledge and skills of the first-year students and solve the problem of teaching students with different levels of knowledge. Under these conditions, reading profession-oriented texts is one of the main types of speech activity.

Professional reading plays an important role in the life and work of aviation engineers. Reading in English means for them to fulfill communicative and cognitive needs, as it allows to use all media (magazines, patents, documents, monographs, the Internet etc). The intensive reading mastering at technical higher educational institutions is proceeding from informative to active, creative and intensive forms of cognitive and learning students' activities focusing on professional and everyday communication [1].

But teaching ESP for future aviation engineers cannot confine itself only to reading texts, even informative ones, because language is communication. It is a diffucult task to teach students to communicate using English, because speaking is not stimulated by the need but by the demand for real communication. It is possible to implement this goal, though. The main thing is to overcome the speech barrier and students' fear to speak English. Students should be given the opportunity to use English in real professional situations at English classes. It will allow them to learn to use vocabulary and grammatical forms to express their own thoughts.

Thus, communicative language teaching makes use of real-life situations that necessitate communication. The instructor sets up a situation that students are likely to encounter in real life. Unlike the audiolingual method of language teaching, which relies on repetition and drills, the communicative approach can leave students in suspense as to the outcome of a class exercise, which will vary according to their reactions and responses. The real-life simulations are changing from day to day. Students' motivation to learn comes from their desire to communicate in meaningful ways about meaningful topics.

Margie S. Berns, an expert in the field of communicative language teaching, writes that "Language is interaction. It is interpersonal activity and has a clear relationship with society. In this light, language study has to look at the function of language in context, both its linguistic context (what is uttered before and after a given piece of discourse) and its social, or situational, context (who is speaking, what their social roles are, why they have come together to speak)" [4, P. 5].

Communicative techniques can develop students' productive, receptive and interactive skills that are necessary for effective communication. Activities with listening and reading aim at developing students' skills of receiving information. Activities with speaking and writing develop students' skills of producing information. Both can be interactive and thus promote communication.

Some activities are more associated with reading and listening (receptive skills), while others are more often used with speaking and writing (productive skills).

Methodologists interpret some types of speech activity differently. For example, W. Littlewood distinguishes two basic types of communicative activities: functional communicative activities and social interactive activities [8].

Jeremy Harmer thinks that the main types of work with students are: pairwork or groupwork, communication in a controlled way at first, use of "acting out" and reading aloud and role-plays [6, P. 131–132], whereas John Haycraft proposes the following activities: pairwork and groupwork, dialogues, chain stories, mime stories, storytelling, conversation, talk-lesturettes, improvisation, and role-plays [7, P. 53–55].

According to J. Sheils, the following common techniques fall down into two groups:

1) information gap: jig-saw, interviews, reading the cues, communicative games etc;

2) simulation: role-play, problem-solving, socialization, project work etc. [10, P. 45].

Information gap is organized to promote speaking activities. Information gap is a situation when a participant or a group possesses the information, which others do not have, while others have the information that this group is missing. Their task is to use communication for finding out complete information on how to solve the problem. Information gap can take the format of an opinion gap when the participants differ in their opinions. The gap is filled in the course of active

communication.

Any activity with an information gap can be turned into a communicative game if there are rules to name the winner. Information gap is a frequent technique used in order to organize a communicative game.

Jig-saw reading activity is organized most often with the texts that are meant for reading or listening (jig-saw reading and jig-saw listening). A text is divided into several parts. Every participant has access to only one part of the oral or written text. They ask each other questions and provide information to joint the parts of the text together and to know the contents of the whole text. Another variant is the jig-saw listening when each participant or a small group listens to only some information as a part of the whole. These pieces can be brought together only in the course of active communication efforts.

Productive skills of speaking and writing are developed in simulations. A simulation means that an episode of the real world is reproduced in the classroom environment in the form of the role-play, discussion (problem solving), a piece of writing or a project work.

It is very effective to use role-plays or dramatization in which students interact with each other in pairs or in groups. Such techniques allow to make a lesson more diverse and also enable students to implement communication skills and language skills.

Dramatization is a reproduction of certain situations that may arise in future professional activity. The task of students is to put the topic and subject in communication. The participants of a role-play act different roles. At the same time their task is to solve a profession-oriented problem.

A set of problem tasks gives the possibility of using English for everyday communication, as well as for professional tasks. By ensuring the formation of appropriate types of speech activity, they help realize the basic function of ESP learning at a higher educational institution – professional formation of students' communicative competence. Creating problem situations, it is necessary for the tasks to correspond the level of students' knowledge and intellectual abilities, reflect real situations of professional activity, and give a problem in an unexpected way.

A very interesting type of work during teaching ESP is using discussion games to discuss topical questions interesting for students. Each student chooses a role and speaks on behalf of the chosen character. The content of discussions can be any real-life problem. You can also create professional-focused discussions related to their future profession using appropriate profession-oriented vocabulary. The information taken from profession-oriented technical texts and articles can be the basis of such discussions.

Creating problem situations promotes creativity in the search for joint decision-making. This is how a discussion – the most active form of thinking – is born. Its advantages for ESP learning are undoubted (e.g., the ability to express one's opinion). Educational and training activities using the method of group discussion take place in the following stages: group creation, identifying and discussion of problems, listening to another point of view, finding a compromise with other students. All these stages develop the ability to speak English. In order to increase the effectiveness of this method of ESP teaching, it is proposed to deal with current problems of the future specialists in their field of activity. Thus an interactive form of learning is particularly important for ESP learning, because a student is constantly in the language environment while being in active work.

The communicative approach to teaching ESP for future engineers is focused on learning through communication. The use of aviation English in real communicative situations has generated some trends relevant for teaching ESP:

1) communicative orientation of all types of training;
2) "learner-centred approach";
3) "the whole person approach";
4) teaching materials are given on the situation-thematic or functional principle;
5) the main types of students' activity are pairwork (dialogue) and groupwork (polylogue).

Communicative teaching is often organized in the three-phase framework. Three-phase framework means subdivision of the teaching process into three phases: pre-activity, while-activity and post-activity. Pre-activity is organized to provoke students' interest towards the main task, to

motivate performance, to activate in students their prior knowledge and to prepare them for the language that can be necessary to perform the main task. While-activity is organized as oral or written communication and is based on engaging students in the communicative tasks. Post-activity is reflection on the ideas and language that was produced during the main activity. This phase also includes additional language drill and integration with other skills. [10].

Conclusions

The integration of Ukraine with other countries, special conditions of activities in aviation and as a result modern requirements for future aviation specialists have caused radical changes in higher education and set challenges to improve the quality of future specialists' knowledge of aviation English. Such requirements to higher education result in using the communicative approach to teaching ESP as one of the most effective methods. Its implementation depends entirely on the willingness, competence and knowledge of an instructor. The ability to engage students in active English learning is a very complex task and in many cases it is determined by the efforts of students to acquire and improve their language skills. The communication-oriented techniques of teaching ESP, mentioned in the article, influence not only communication and speech-thinking activities, but also cognitive and creative activities. They train attention, memory, develop thinking and have high motivation characteristics of future aviation engineers.

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M.-M. Rybalko, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

(UN) SAFETY DISCOURSE: AN ATTEMPT AT SEMIOTIC ANALYSIS OF NEWSPAPER TEXTS ON AIR TRAVEL SECURITY PROBLEMS

The paper examines and describes fragments of the modern American newspaper discourse, with the focus on the concept of (UN)SAFETY. The author identifies and analyzes purely linguistic elements in a wider context of social interactions on the basis of the narrative semiotics theory, developed by Algirdas J. Greimas.

With air travel growing rapidly all over the globe, the safety issues have become a matter of primary concern both for airlines staff and passengers. Multifaceted and overwhelming, the concept of safety has plenty of manifestations. First and foremost, the present-day reality, 24/7 of flights, involving millions of passengers and professionals both in the air and on the ground, includes a variety of aspects. One can start with purely technical ones (aircraft check ups, baggage and passengers screening), through psychological points, such as necessity to deal with emotional tension, which builds up the load on top of physical challenges travelers have to face, and up to anxiety, stress and even strikes of panic tackling. Next, the theoretical level of risks estimations, hazards modeling, tests and reports on technical travel and communication issues. And finally, the virtual level of safety discourse, which unfolds in the media and over the last decade, since Sept. 11, has been balancing within the shaky conceptual uncertainty of (UN)SAFETY.

The media discourse reflects the mainstream tendencies in and about the aviation industry. We have selected a range of articles from the New York Times archive on the problems of airports and air flights safety, thoroughly highlighted in the media as: «All of these topics need to be explored in the coming year, especially as the T.S.A. works to carry out new procedures based on what its director, John S. Pistole, calls “intelligence-driven, risk-based” and multilayered approaches to security, including the expansion of the so-called known-traveler program» (CO). The texts exemplify typical topics of aviation security and attitudes to the issue under study, potential threats: airport / aircraft security inconveniences and inconsistencies in particular.

The subject of research combines both linguistic elements and a wider context of social interactions, which dictates an interdisciplinary approach to be adopted. We have chosen Algirdas J. Greimas' narrative semiotics, which differs from an exclusively linguistically oriented semantics, presenting a promising perspective as a relevant tool to carry out the study on discursive level, narrative level, and abstract level of deep laying conceptual structures of the modern newspaper discourse.

The key concept of (UN)SAFETY is represented either explicitly or implicitly on each of the levels mentioned. We are going to focus on the peculiarities of its representations in the form of semantic fields (isotopies) on the upper, explicit discursive level, trace the typical narrative programs and highlight the concepts, which represent the basic values of the sphere and their correlations on the abstract level. The complex study of all three levels of meaning in the outlined air travel segment of the newspaper discourse will help us to elicit the fundamental transformations the concept under study has recently undergone.

We will start with the figurative component of the first, discursive level. The term covers all the text elements (figures), which refer to the external, physical reality, open to the five human senses. This most explicit level of verbal textual representations is opposed in form to the internal, abstract reality of concepts on the most implicit, third level of meaning. Successive interpretation of these consistent levels of discourse provides further detailing of particular segments of the language picture of the world (the English one) and adds to their better understanding.

Here is a typical discoursive fragment under analysis; we have underlined the text elements, which are going to be relevant for the present study:

«*I believe that my name is on a Transportation Security Administration watch list. Often when I fly, the letters "SSSS" on my boarding pass alert gate agents to pull me aside for extra screening. But on a recent trip, a T.S.A. employee failed to notice the "SSSS." I'm fairly certain that I am on the T.S.A. list because of my animal rights activism. I am not a threat to civil aviation. I was happy to avoid yet another bothersome search, but should I have spoken up? I wouldn't want the guy to miss an actual threat. NICK A., FLORIDA*

Despite posing no danger to air safety, you feel you are treated like a potential shoe-bomber, singled out for even more hassles than the average flier. Yet your concern is not how to escape this surveillance but how to increase it. (…)

In some studies, screeners, their eyes perhaps glazed over from so many black wheelie suitcases, have missed a high percentage of decoy weapons. Calling your screener's — or perhaps his supervisor's — attention to his lapse could help startle him back into focus.

False negatives are, however, only one kind of security risk. False positives, of which you claim to be an example, pose their own dangers. The more law-abiding people who are flagged in error, the more attention is diverted from dangerous people. So what's more ethical: to persuade a screener to spend more time on you? Or let him move on to someone scary?» (WY).

The basic figures in the textual fragments under study include lists of words, which refer to:

a) **actants**: *air safety,* gate agents, a T.S.A. employee, a threat to civil aviation, an actual threat, *a potential shoe-bomber, the average flier, screeners, your screener's — or perhaps his supervisor's — attention, false negatives, one kind of security risk, false positives, dangers, law-abiding people, dangerous people, someone scary, airport security, innocent people, the system, the bad guys;*

b) **place of action**: *on a Transportation Security Administration watch list; aside; back into focus; in a realm where the wrong move, or even an ill-advised joke, can land you in handcuffs; on the F.B.I.'s radar; near checkpoints; elsewhere in airport terminals;*

c) **time of action**: *often, on a recent trip, as long as you have free access; since the 2001.*

Other meaningful figures – the textual expressive elements – include **grammar / syntactic characteristics**, such as frequent use of subjunctive mood: «*With airports, if you were to build a new terminal from scratch, sure, you could do a better job of anticipating certain security issues*»(BN); peculiar aspect: Present Continuous forms for temporary situations, actions in progress within the context of the present unsafety and the possibility of some safety perspectives: *you're going to have these potential issues; while technology for detecting explosives is being improved; who nevertheless has serious reservations about how it is being done here.*

Narration characteristics:

- **wide quotations** of officials, decision-makers, airline representatives, paragraphs of direct speech, citing of regulations, instructions e.c., which add much to the reliability and cogency of editorials, as well as numerical data:

«*Millions of Americans who got on a plane over the Thanksgiving holiday heard the admonition: "Please power down your electronic devices for takeoff"*» (BD); «*Nevertheless, Les Dorr, a spokesman for the F.A.A., said the agency would rather err on the side of caution when it comes to digital devices on planes*» (BD); «*Michael Altschul, senior vice president and legal counsel for CTIA, the wireless industry association, said … "The fact is, the radio frequencies that are assigned for aviation use are separate from commercial use"*» (BD); «*There are other regulations about liquids and gels that strike me as odd, strictly from the security perspective. For example, "persons with disabilities," the T.S.A. guidelines say, may carry on liquids and gels in quantities in excess of 3.4 ounces. These include prescription and over-the-counter medicines, as well as eye drops and other "items used to augment the body for medical or cosmetic reasons…"*» (CO);

- **numerical information** (in bold) is hardly ever displayed using tables and charts in this type of discourse, in contrast with emotional evaluations and expressive means (underlined) being more characteristic for the discourse type under study. Dramatizing and exaggerating both positive and negative features of the aviation sphere are frequent – through emotionally coloured words, set expressions, idioms, collocations:

«*A lot of frequent flier miles have been piling up* ***in the 10 years*** *since the terrorist attacks*

*brought the domestic airline industry to its knees **in autumn 2001**. Airlines in the United States lost **$55 billion** and shed **160,000 jobs** during that decade. But the industry has worked through the economic tumult. **A decade later**, the system is smaller in terms of capacity, but it's still in good working order. **Last year**, for example, **720.4 million** people boarded airplanes in the United States, slightly higher even than **the 719.1 million passengers in 2000***» (SS);

- **modality** presents various degrees **of uncertainty**:

«*"Insufficient information to support changing the policies," Mr. Dorr said. "There was no evidence saying these devices can't interfere with a plane, and there was no evidence saying that they can"*» (BD), «*The government might be causing more unnecessary interference on planes*» (BD);

- **emphasized pronoun *you***, referring to the reader, i.e. potential traveler, thus sharing responsibility for the feeling of (un)safety with him/her:

«*Beyond merely obeying T.S.A. procedures, your obligation to aid their enforcement depends in large part on whether you think them just. Despite your own experience, you seem to have no doubts about the underlying validity of a watch list (which is compiled by the F.B.I., not the T.S.A.) or its ability to protect innocent people. If you feel the system is helping you, it is fitting that you should help the system. But how?*» (WY); «*How do you fully secure something as big and sprawling as an international airport against a terrorist bombing (…)You cannot, security experts I spoke with on Monday say*» (BN);

- **jokes and irony**, with ridiculous situations opposed to some, often minor, inconvenience, provoked by sheer necessity:

«"I thought they confiscated pies at security," I told my daughter. "Not any more," she said. "Now the screener just jokes about having to eat a slice to make sure it's safe"(CO); *«"Some would argue that you make more money from ancillary fees than you do operating the airplane, and that you'd like to figure out a way to sell us pillows and things while keeping the plane on the ground," Peter Greenberg, the CBS News travel editor …*» (SS); «*On the other hand, "gel-shoe inserts are not permitted," the T.S.A. guidelines say. But powdered mashed potatoes are, though Bob Burns, writing on the T.S.A. blog, adds, "Powdered mashed potatoes are a crime against humanity"*» (CO);

- **rhetorical questions**:

«*But, why can't I read my Kindle or iPad during takeoff and landing?*» (BD);

- **generalizations**, often repetitive with a reinforcement:

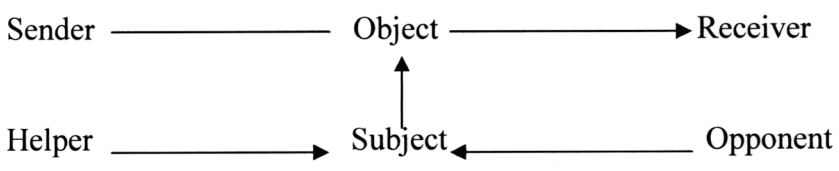
«*it needs to be made clear that nothing is 100 percent secure*»; «*Nothing in public is ever going to be anything near 100 percent secure in a free society*» (BD);

As the semiotic analysis reveals on the upper, discursive level there are occasional references to the positive manifestations of the concept under study – SAFETY. Alongside, we have found numerous negative manifestations of the concept, which massively add to its UNSAFETY aspect.

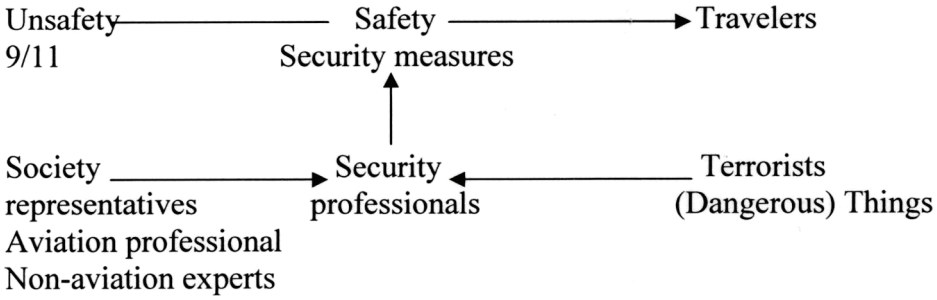
The list of actants, both humans and things / abstract notions, may be further subdivided into detailed groups according to the category of cooperation. We have elicited the following isotopies in the selected newspaper articles:

- aviation professionals
- travelers
- officials, experts from non-aviation sphere
- terrorists
- relevant things and objects
- security measures

The second, narrative program(s) level of discourse contains fundamental universal narrative schema. The last comprises six actantial roles / functions, coupled into three pairs of binary oppositions, which cover any possible type of human relationships and interactions.



Dominant isotopies listed above reveal key oppositions which correlate with the actantial roles / functions in the narrative schema of the discourse under study. Sender provokes / motivates certain actions / transformations on the part of Subject, who aims at gaining Object in their search. Subject is (optionally) assisted and hindered by Helper and Opponent respectively. Receiver is affected by Sender and acquires a craving / need to start activity, after that Receiver either transforms into a Subject or delegates their power to start the search to some other Subject.



The third text level, the deepest one, contrasts with the physical world of the upper figurative level; here we have elicited the basic values of the text. Taking into consideration the key oppositions of the first and second text levels, we follow their fundamental transformations on the most abstract level.

Within the last decade the focus has shifted, or rather widened, from the opposition *travelers vs. terrorists* to *humans vs. things*, as the insecurity problems, provoked by people, are now topped by airport / aircraft security inconveniences and inconsistencies issues. The last have probably arisen largely due to consumerism habits of the modern global community: «*To avoid paying to check a bag, more passengers have been lugging* ***more belongings*** *onto already crowded planes. Some industry analysts have estimated that as many as 59 million* ***extra bags*** *are now being carried onto planes each year. "It's much harder to find space for your bag now on the airplane," Mr. Parker said. He said the trend hasn't created actual departure delays, "but the boarding process takes longer"*» (SS).

The *things* include a wide variety of objects, starting with personal belongings up to infrastructure items of the aviation industry: «*Over the last decade, Mr. Parker said, the domestic airline business came to terms with the reality that it "had gotten way overbuilt, with too many hubs and too many airplanes"*» (SS).

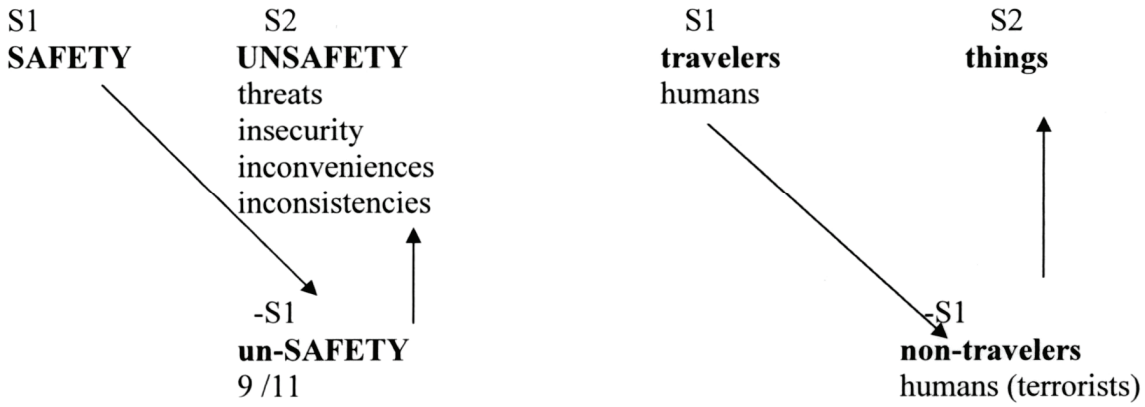
The *things* entail not only ever more processing operations, but also general lack of stability for a human being in the mainstream of material objects, the *things* isotopy features: bags, footwear, liquids, gels, creams, nonmetallic explosives, electronic devices, E-readers, cellphones, gadgets. A person happens to be blocked / threatened by things / objects, rather than other people: «*When you stand in line at the T.S.A., you see that the line is because of all those bags going through, not because of the people themselves being processed*» (SS).

Operations, which things might undergo, constitute a separate isotopy: to process, to find space for, to be subjected to additional screening, to be limited in volume, to be restricted, to be (strictly) prohibited, to be unwrapped for further inspection, to be confiscated etc.: «*Snow globes, which are filled with who-knows-what kinds of liquids, remain strictly prohibited. You can bring that apple pie through, but that merry snow globe with Frosty the Snowman inside will be confiscated*» (CO).

The semiotic squares below feature the relationships of conflict and contradiction between *safety* and *unsafety*, *humans* and *things*, as well as the relevant transformations, which have taken place.

In order to minimize negative response on the part of travelers due to present security measures, official spokesmen tend to be neutral in their comments, base upon factual information, make frequent references to recent studies, reports, and competent sources among government, military, and police representatives, as well as occasionally add a human touch of humorous remarks. Alongside, they demonstrate a steady reluctance to start changing the policies, which prove to be out of date. A vivid example is the unnecessary interference on board, when people are

asked to shut their devices down for take-off and landing. Journalists, often speaking on the part of travelers, are more direct and straightforward when unveiling the slow motion within the extremes of old rules through rational innovations up to new frames of the industry functioning, which have developed over the decade since 2001: «*As more and more people transition from paper products to digital ones, maybe it's time to change these rules*» (BD).



The scale of general transformations presented consists of a few successive stages: Hazards – Airport / Airline Security Challenges – Inconveniences – Norm. Nowadays the system is striving through a wide range of inconveniences for the state of balance and mutually accepted norms in perspective. Meanwhile, the newspaper discourse abounds in attributes of the UNSAFETY concept, with non-humans, i.e. things and objects, gradually becoming its ever more significant source.

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O. Shostak, PhD, Assoc. Prof.
Y. Pryshupa, Senior lecturer
(National Aviation University, Ukraine)

THE MAIN COMPONENTS OF SAFETY CULTURE IN AVIATION

The purpose of the article is to summarize, analyze and integrate the numerous reports and studies that have been conducted to define and assess safety culture, as well as the highly related concept of safety climate. This article will enable researchers and safety professionals to better understand and assess safety culture and that it will facilitate the sharing of information and strategies for improving safety culture across organizations and industries.

Culture surrounds us and influences the values, beliefs, and behaviors that we share with other members of groups. Culture has been defined in a number of ways, but most simply, as the learned and shared behavior of a community of interacting human beings. An important question for the aviation community is how good is the safety culture in aviation? Aviation culture is closely related to the field known as human factor. In recent years the distinction among aviation culture, human factors, and the more hardware-oriented discipline of engineering psychology has become very blurred. In order to measure something we must first determine what it is and then gain an understanding of it. There are about as many definitions of culture as there are publications about it.

Organizational safety culture means that everyone, from the chief executive down through the entire company, is committed to continuous safety improvement, always watching for potential hazards and their associated risks, and then developing and implementing appropriate and effective mitigation to either eliminate the hazards or reduce the risks to an acceptable level. An imbedded safety culture is arguably the most significant element of the foundation for safety excellence. It is even more powerful when it includes the elements of a “Just Culture”.

Just Culture is the term used to describe the safety-supportive balance between system and individual accountability and includes achieving a balance between an open learning safety culture and the need to hold individuals accountable for their choices. Where a just culture is inherent and is effectively documented, other elements will more easily fall into place. Where it doesn’t exist, safety cannot be optimized.

Professional culture has strong cultural identities. This applies to psychologists, air traffic controllers, and pilots, to mention but a few examples. Often, there is competition to be selected and successfully complete the required education. Upon completion of training, many people within the profession join powerful unions, which act to preserve the rights and interests of members. Some unions offer members sponsored education to maintain or build additional skills; they also typically provide guidelines for ethical behavior within the profession.

Thus, unions help to socialize new members into the group (profession) by exercising control over the members to some extent. Professionals, including pilots, psychologists, and physicians, are often highly enthusiastic and proud workers. They will make every effort to be successful, and few people quit the profession after having entered the work force. On the other hand, a strong professional culture can give individuals a false sense of invulnerability and disregard for their own limitations, according to Helmreich and Merrit. Thus, culture is a deeper phenomenon that is not easily charted or categorized. Others say that although culture is what is shared, or common, for members, climate is a kind of “average” of the group members’ experience preferably the interpersonal relationships within the organization.

There are three main components to safety culture; psychological, situational and behavioural, and there are a number of tools available, qualitative and quantitative, which can be used to measure them [3]. Situational aspects of safety culture can be seen in the structure of the organisation e.g. policies, working procedures, management systems etc. Behavioural components can be measured through self-report measures, outcome measures and observations.

The psychological component is most commonly examined by safety climate questionnaires

which are devised to measures people's norms, values, attitudes and perceptions of safety. Over the years a number of questionnaires have been developed by various researchers in an attempt to identify the main factors that comprise safety climate [6]. Although such surveys produce a snapshot of an individual's safety climate the results tend to be aggregated at a group or organizational level to give a view of the overall safety climate of the organization. Safety cultures take safety seriously. They function well and make money in the process. DuPont, for instance, is widely regarded as the most safety conscious company in the world but it also stands regularly at the top of the Fortune 500 ratings for chemical companies. Shell Group has improved its safety performance spectacularly in the last 15 years and, while subject to the vagaries of the price of oil, has succeeded in returning considerable profits, measured as return on average capital invested. Interestingly, part of Shell's improved safety performance, in the area of fatal accidents, can be traced directly to its quite aggressive safety management of its aviation contractors; they have had no aircraft crashes for many years despite high exposure hours and operations in very difficult environments. The following list was first identified by Jim Reason (1997).

An organization should be:

Informed – managers should know what is going on in their organization and the workforce should be willing to report their own errors and near misses;

Wary – the organization and its constituent individuals should be on the look out for the unexpected, maintaining a high degree of vigilance;

Just – the organization should operate a 'no blame' culture within the constraint that some actions can be agreed *by all* to be totally unacceptable and worthy of approbation;

Flexible – such organization can operate according to the demands, so they can provide both high tempo and routine modes of operation and can change when required by circumstances;

Learning – organization should be ready to learn in order to improve and be capable of implementing what needs to be done to reform.

Safety climate measures have been widely researched and tend to be used as substitute measures of safety culture.

Recent interest in the measurement of safety culture has resulted in a number of reviews of the area. These reviews demonstrate the wide range of assessment tools, typically self-report questionnaires from large scale surveys, that have been developed. Such assessment tools are often customized to a particular industry, principally the energy industry but also manufacturing and health. In a review of the area, Flin looked at 19 studies and found that 16 were derived from literature reviews of the safety research; of those 6 studies incorporated interviews and focus groups conducted at the workplace. The other 3 studies used existing questionnaires. Typically factor analysis is then used to identify underlying structures. Again, Flin found a large range of variation in the number of factors identified: from 2 to 19 in the studies that they reviewed. Whilst Lee and Harrison extracted 28 factors in their assessment of safety culture in nuclear power stations. As Flin point out the dimensions of climate measures vary considerably in terms of criteria, statistical analysis, size and composition of workers and industry. Thus drawing comparisons between the measures is difficult not only because of the methodological differences outlined but also because of language and cultural variations.

Consistency amongst safety climate measurements is difficult. For example, Zohar (1980, cited in Glendon & Litherland, 2001) found eight safety climate dimensions amongst Israeli production workers including management attitudes, effects of safe conduct on promotion, work pace and status of safety officer and safety committee. However, when Brown and Holmes (1986, cited in Glendon & Litherland, 2001) used the same questionnaire on a sample of American Production workers they found only three safety climate factors: management concern, management activity and risk perception. Dedobbeleer and Beland tried to validate the three safety climate factors on American construction workers but found the two factors of management commitment and worker involvement, more appropriate than the three. Coyle administered a safety climate questionnaire to two similar organizations and found that while 7 factors emerged for one organization only three factors emerged for the other. Varonen and Marrila (2000) however, used

the same safety climate variables (organizational responsibility, workers safety concerns, workers indifference to safety and level of company safety precautions) as used in two previous Finnish studies and found similar results. They suggested that the results indicated that the safety climate structure is relatively stable among Finnish workers.

Studying national differences in culture or, for that matter, other aspect is a complicated job. Completing the study or survey in approximately the same way in vastly different countries represents one of the challenges. For example, is it possible to sample participants in a similar way, and is the same procedure used in all the countries included in the study? The nature of the matter is that the more different the countries are, the more difficult it becomes to complete such a task. There may be different regulations as to the available registries of the target group and whether permission will be granted to extract information from these groups. Ideally, the groups in question should be as similar as possible, even though researchers typically have to admit that, in practice, it is impossible to complete a survey in exactly the same way in all countries. Greater similarity between groups (in terms of other variables) generates a greater degree of certainty to conclusions that differences are due to cultural factors. Another issue is represented by the challenge of translating questionnaires between different languages. Even though a substantial amount of effort is put into translations, a statement may convey a different meaning in another language, or certain words and expressions may not exist in the target language or correspond to the original one. Some cultures may have a greater tendency to agree to a specific statement; in other cultures, opinion is expressed more freely and the extreme ends of the scale are used to a greater extent.

Like organizational culture and organizational climate, boundaries between what is meant by safety culture and safety climate are unclear. Some people are of the opinion that they are different but related terms. That is, safety climate is measured using a questionnaire and provides a snapshot of how the employees perceive safety (often in relation to a speciшc issue), whereas safety culture refers to more lasting and fundamental values and norms that partially overlap the national culture of which the organization is a part (Mearns and Flin 1999). In practice, however, the notions are used interchangeably, and quantitative questionnaires often overlap in terms of content. Wiegmann and colleagues (2004) have described a number of traits or presumptions that are shared in the different dentitions of safety culture. These commonalities are that safety culture is something a group of people have in common, it is stable over time, and it is reAn important aspect in a sound safety culture is management commitment and involvement in the promotion of safety. To achieve this, it is crucial that the highest levels of management make the necessary resources available and support the work involved. It must be reāected in all aspects of the organization, and routine evaluation and system improvements must take place. However, not only the higher levels of management but also lower level administrators, who should participate in activities related to improving safety, are important. Little is gained by sending employees to safety classes if those who are monitoring the implementation of routines do not participate. Another indicator of safety culture is that those who are performing the speciSeveral questionnaires have been developed to map safety culture in aviation; most are multidimensional and consider many of the aspects mentioned in the previous section. A study of ground personnel in a Swedish airline surveyed nine aspects, including communication, learning, reporting, and risk perception (Ek and Akselsson 2007). In the survey, managers were asked to reect on what they thought the employees' responses would be. Managers were more positive about safety culture than operators. Meanwhile, significant consistencies were found for their evaluations of the various aspects of the company's safety culture. The lowest scores were given for the "justness" and "exibility" dimensions; this applied to both management and employees. The former dimension assessed the extent to which making occasional mistakes was accepted, while the latter measured the extent to which employees were encouraged to provide suggestions for improvements. The highest scores were given for the dimensions "communication" and "risk perception".

Conclusions

The main findings from the article can be summarised as follows: culture can be seen as a

concept that describes the shared corporate values within an organisation which influences the attitudes and behaviours of its members. Safety culture is a part of the overall culture of the organisation and is seen as affecting the attitudes and beliefs of members in terms of health and safety performance. Safety climate is a distinct yet related concept which can be seen as the current surface features of safety culture which are discerned from the employees attitudes and perceptions. However, in reality the terms are not so clear cut and many writers use theterms safety culture and safety climate interchangeably. Aviation is a society and a culture on its own. As a pilot you need to be an independent and clear thinker, but also someone who is capable of being part of a team. Autocratic behaviour in cockpits has cost many lives, which is why it is compulsory for Commercial Pilots to do CRM, (Cockpit Resource Management), courses annually. Some Captains have joked that CRM has saved their marriages, since it is all about communication.

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O. Zhuravliova, Senior lecturer, A. Golovnia, PhD, Assoc. Prof.
T. Smirnova, Senior lecturer, S. Shurma, PhD, Assist. Prof.
(National Aviation University, Ukraine)

SHAPING INTERPRETER'S COMPETENCE IN AVIATION SPHERE

The article zeroes in on the systemic approach in shaping and improving interpreter's terminological competence in aviation. The role of terminological competence in forming and developing professional competence is being discussed.

Human body is a system capable of perceiving and processing signals as well as forming reactions in response to a wide variety of other signals emerging in the environment. Given this perspective, we may perceive the individual even at the level of physical response as an intricate information system aimed at adapting and developing the body in the habitat. The most important human feature is the ability to reflect the information received in form of signs or symbols; i.e. to formalize this information and communicate the experience to other generations in form of knowledge. To tell even more, a human being is infinitely improving the skills of manipulating with various information categories by way of storing the knowledge and expanding cognition of the world and themselves, and thus evolving as a subject represented as information system. In terms of our research the aim of which is to investigate the process of shaping interpreter's competence in aviation sphere via setting out the optimal conditions of effective training, understanding the human as an information system is of the utmost importance. We proceed from the idea that in the process of intercultural communication an interpreter stands out as a mediator who has to be professionally knowledgeable about both interlingual and intercultural information space. Professional orientation of communication requires additional efforts on interpreter's part as he/she becomes the holder of another specialized block of information. Therefore, while shaping aviation interpreter's competence, the variety of information abilities a person possesses, and the influence of other competences upon forming an overall professional competence, as the information space of the professional expands, are to be taken into account.

It is the fundamental truth that an individual can perceive, differentiate and transform the information of different sort:

- sensory (gustatory, tactile, visual, audial, etc.);
- emotional (social-communicative, status, role, and culturological information, information denoting interpersonal and group subject-subject and subject-object relationships, etc.);
- intellectual (sign, symbol, sense, subject and professionally oriented, abstract and theoretical, etc.);
- psychic (personal or other people's states and anxieties, information of moral character, information of psychological character, information about sense of life and the highest values, etc.).

It is quite typical of individuals to show their worth through materialization of needs. The character of those needs allows creating the hierarchical model in which one can determine the contours analogical to the types of information perceived by a human being:

- biological contour (sensory level of information);
- social contour (emotional level of information);
- mental contour (intellectual level of information);
- psychic and spiritual contour (psychic level of information).

Bringing forward those interdependent and interconnected contours which form holistic system lets making a model of a personality as information system created by a combination of respective matters. These information contours or essences are used by people as a way of information exchange with the environment (including interpersonal communication). The range of such contours creates a human being who, unlike other creatures, has specific characteristics, abilities and features.

Therefore, taking into account such a viewpoint, we may suggest the following definition of a human being as information system: this is the integral range of hierarchically organized biological, social, mental,

psychic and spiritual contours which work as a single system of perception, collection, processing, reproducing and generating information in the process of reality cognition and creation of its subjective model (subjective reality). The information for the personality as an information system is the major way of cognizing and organizing the reality in the consciousness of a human which is represented as "model worlds". The mechanism of the operation of interchange is a mere reflection with the help of which the human can both perceive and reflect the information. At this point, the reflection of *biological contour* may be registered through the manifestations of sensory, biological, biochemical or physiological character; reflection of *social contour* is registered as emotional, action, role and behavioral character; *mental contour* reflection is manifested as mental, creative, cognizing and symbolic demonstration; and *psychic contour* reflection is registered through the manifestations of motivational, sense, value, orientation, and individual (psychological, mental and spiritual) character. All these components of a person as the information system and the aspects of their manifestation should be taken into consideration in the process of shaping and development of specialist's professional competence in aviation sphere.

Interpreter's professional competence is the readiness and ability to render (both in written and oral forms) specialized information from one language to another taking into consideration the difference between two texts, communicative situations and cultures. Such competence includes professional knowledge (theoretical, procedural and integrated), corresponding professional skills and expertise, and professionally important qualities of the interpreter of professional texts. Interpreter's competence is a heterogeneous phenomenon as it integrates a number of components / competences to which we refer: (1) professional competence or relevant knowledge, skills and expertise for effective professional activity including the knowledge of Translation Theory and related Comparative Lexicology, Grammar and Stylistics; understanding of the norms of translation languages and translation norms influencing the choice of translation strategy; command of translation techniques; skills of professional translation within one or two genres or styles of oral or written texts; skills of working with reference sources of information; possession of current information technologies; psychic qualities of the interpreters, their behavior, skill to control emotions and tackle typical professional tasks; (2) intellectual competence which refers to interpreter's erudition, and ability to evaluate and mobilize their efforts and skills; (3) language competence as the knowledge of lexis and skill of overcoming language difficulties in translation; (4) speech competence or special "interpreter's" knowledge of the two languages both at the receptive and productive level; (5) semantic competence or deep understanding of the text, and the skill to perceive and render the implicit level of the original text, and possession of extralinguistic background knowledge; (6) text-formation competence or the skill of correct understanding of original text type, its structure and elements, and the knowledge of the algorithm of transition for preserving the typological features (translation strategies and methods); (7) interpretation competence or the way a translator interprets the text while translating meaning viewing it through the eyes of a language speaker belonging to another culture; (8) intercultural competence or the knowledge of the country, its culture and traditions; sociocultural data; knowledge, understanding and skill of rendering realia connected with life and customs of the country which the original belongs to.

While training aviation interpreters we should also take into account terminological competence. Such approach seems to be relevant if we consider the percentage of terms in aviation texts for understanding and translating. The aviation texts as a rule abound in highly specialized terms which make it difficult to interpret and translate the latter. We consider terminological competence the major one in the process of shaping aviation interpreter's professional competence. Thus, terminological component has to be an indispensable part of any interpreter's training activity.

As the main task of the interpreter while performing oral translation, either simultaneous or consecutive, is the maximal rendering of content done as quickly as possible and with the highest possible degree of preserving the unique speaker's style. Therefore, shaping oral translation competence is connected with the skill of quick oral interlingual transmission.

The process of shaping interpreter's competence in the sphere of aviation is done in two stages: (1) insight into the terminological system (knowledge) and the use of terms in speech (skill); and (2) gaining and developing sophisticated speech expertise (expertise). Hereby we proceed from the idea that the students are already familiar with the terminological base as they work on building it in Aviation Terminology Translation

classes; consequently, during the classes of oral translation they have the possibility to apply the skills shaped.

The peculiarity of oral translation competence requires doing exercises (1) for memory development in order to be able to remember a considerable amount of information; (2) for controlling emotions, mood to stay neutral irrespective of the speaker's mood; (3) for relaxation to relieve psychic stress, adequately model speaker's personality and stay psychologically stable; (4) for switching from one language to another or from digital code to verbal. We see that in this way all the types of information discussed above are applied in accord with four information contours.

Oral translation competence, in our opinion, should include language competence (both receptive and productive); communication competence; translation competence (bilingual and translation skills); technical competence (information coding and decoding, presentability); personal characteristics (memory development). If the first three components are inherent in all types of translation, the latter two are peculiar to oral translation.

Shaping oral translation competence presupposes necessary language training that is the minimal knowledge necessary to adequately understand the text. The knowledge of mother tongue is also a part of language competence. Communicative competence is closely connected with the difference in cultures and the translator is supposed to know the cultures of mother language and target language as well as possess other extra-linguistic knowledge. As for bilinguality, it is important to know how to switch from one language to another which also means to automatically find the equivalent in another language. Studying translation equivalents and translation techniques contributes to the development of the skill.

We suggest that oral translation training should start with theoretical classes during which the students get familiar with the basic rules of oral translation. The course in theory of translation should not be too long as most theory becomes quite understandable while doing exercises, and the final aim of such a course is the development of translation expertise. However, if necessary, the instructor should stress upon the theory while doing practical exercises.

The practical part of the general course should be structured in such a way as to do a variety of exercises: the ones aimed at shaping certain skills at the initial stage, more difficult and varied ones at the intermediate state, and multi-purpose ones at the final stage. Accepting such an approach, the lower level skills excelling continues during intermediate stage and is finalized at the last level of skill-building. The choice of the texts for exercises is determined by the need to bring the class translation closer to the real work conditions of the interpreter in aviation sphere. The number of students in a group is optimal if it does not exceed 6-8 people. Under such system, depending on the technical possibilities, either one student performs the translation while others listen attentively to him or her and focus their attention on translation mistakes which are discussed further in a group, or using specialized equipment all students translate the text in headphones and later listen to the recording of their translation analyzing it, or listen to the translation chosen by the instructor and analyze it comparing to theirs. The analysis of the translation done in group should be performed according to the following criteria: grammar, pronunciation, stylistic mistakes in translation, adequacy of corresponding equivalents, and other ways of translating the same fragment. The discussion is held among the students and the instructor only guards it and evaluates the adequacy and equivalence of the translation itself and the variants offered. In the end of the discussion, the instructor may point at the types of mistakes, discuss the ways of preventing such mistakes by doing exercises, and add what was not mentioned in the discussion. In such a way, the choice of correct translation techniques is made by the students themselves and the role of the teacher is to direct the students in a heuristic way. As a result, the students try to avoid such mistakes in future translations and thus develop the skill of making right translation choices as well as critical attitude to their own and others' mistakes.

Let us discuss the examples which will help to understand how the interpreter's competence in aviation sphere is shaped if viewed as the human-as-information-system conception. We start with training student's visual-audial and vocal apparatus, his or her memory which means the exercises are targeted at the biological contour of the personality. The initial stage is focused on perceiving audial information, reading

the text and translating it sequentially, then listening and translating simultaneously, developing the speed of visual and audial perception, speaking and remembering what was said. The texts for at this level will contain both simple and complex terms as f*uel level indication system – система індикації рівня палива, direct vertical take off and landing – прямий вертикальний зліт та посадка, airborne early warning platform – платформа дальнього радіолокаційного виявлення*, which the student should understand, remember and render precisely and quickly. At this level the student should become familiar and introduce into the his or her thesaurus specialized abbreviations which are aimed at speeding up the process of translation, for example, *ATM (Air Traffic Management) – ОПР, GNSS (Global Navigation Satellite System) – ГНСС, RW (runway) – ЗПС, IFR (instrument flight rules) – ППП*. At the intermediate stage, the exercises are aimed at student's social, mental, psychical and spiritual contours. They require the students to solve professional tasks at the level of problem situation when apart from terminological competence general language competence is applied, and a single mistake in translation may put passengers' lives at risk. For instance, the word *take off* is translated in the following ways: *1) накинутися (на когось), 2) відірватися (від води, землі), 3) підстрибнути, 4) відміняти ембарго, 5) роздягати, 6) знімати, 7) прибирати, 8) злетіти, вилетіти* and some others. The interpreter's task is to choose the equivalent which suits a particular context: compare the translation of the phrasal verb *take off* in *Vertical take-off and landing (VTOL) aircraft include fixed-wing aircraft that can hover, take off and land vertically as well as helicopters and other aircraft with powered rotors, such as tilt rotors,* where the translation will require the use of the equivalent "*злетіти, підніматися у повітря*", and *The pitch tendency of the plane is "in trim" when the pilot can take his hands off the yoke, without any noticeable change in up or down movement,* where the meaning of the verb is "*прибирати, забирати*" though the utterance just as in the first example belongs to the aviation sphere. Apart from being able to identify the lexical unit in the context and simultaneously find the correct equivalent without stumbling over the words, the student should have the skill of predicting the element of the utterance that is about to follow and to be able to adjust to the speaker's speech tempo. Oral translation practice classes should also aim at developing professional ethics, professional behavior in extreme situation, psychological endurance, ability to cope with stress and pressure. These skills are especially important for certain types of personalities who tend to get frustrated when they lose some information, forget the translation of some words, or cannot cope with the pace of information delivery. Translation expertise development from word to word combination, simple sentence, complex sentence, paragraph, text translation makes the process of training effective. At the same time the instructor does not forget about the dominance of terminological component in shaping interpreter's competence.

Conclusions

To conclude, all levels of perceiving information by a human being, all their contours – biological, social, mental, psychical and spiritual – as informative systems are actualized in shaping oral translation competence. The understanding of human as information system will allow making competence shaping more effective.

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O. Kovtun, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

CONTEXT APPROACH: A NEW PARADIGM IN THE LANGUAGE EDUCATION OF PILOTS AND AIR TRAFFIC CONTROLLERS

The article argues that a Context Approach which places context at the heart of the training should be viewed as the central paradigm in the language education of aviation operators. It concludes by outlining the features of the Context Approach and discussing its implications.

As the number of planes in our skies continues to grow, so the need for safety becomes even more important. Safety experts are constantly seeking to identify means of improving safety in order to reduce accident rates. With mechanical failures featuring less prominently in aircraft accidents, more attention has been focused in recent years on human factors that contribute to accidents. Communication is one human element that is receiving renewed attention.

The role of communication in safety, particularly between air traffic controllers and pilots, is critical. Just how critical has been well established through research: "The most vulnerable link in our ... airspace system is information transfer between air traffic controllers and pilots. Research conducted using the safety reporting system confirms the problem. A review of 28,000 reports revealed that over 70% of the problems cited were in information transfer; this issue continues to represent the largest category of problems reported" [5].

In 1998, the ICAO Assembly, taking note of several accidents and incidents where the language proficiency of pilot and air traffic controller (ATCOs) were causal or contributory factors, formulated Assembly Resolution A32-16 in which the International Civil Aviation Organization (ICAO) Council was urged to direct the Air Navigation Commission to consider, with a high level of priority, the matter of English language proficiency and to complete the task of strengthening the relevant provisions of Annex 1 – Personnel Licensing and Annex 10 – Aeronautical Telecommunications, with a view to obligating Contracting States to take steps to ensure that air traffic control personnel and flight crews involved in flight operations in airspace where the use of the English language is required are proficient in conducting and comprehending radiotelephony communications in the English language [9].

ICAO standards now demand that all pilots flying internationally and all air traffic controllers providing services to international flights must have a minimum level of English.

Both ICAO phraseologies and plain language are required for safe radiotelephony communications. The need for clear and unambiguous communication between pilots and ATCOs is vital in assisting the safe and expeditious operation of aircraft. It is important, therefore, that due regard is given to the use of standard words and phrases and that all involved ensure that they maintain the highest professional standards when using radiotelephony phrases. This is especially important when operating within busy sectors with congested frequencies where any time wasted with verbosity and nonstandard, ambiguous phrases could lead to flight safety incidents.

Of the many factors involved in the process of communication, *phraseology* is perhaps the most important, because it enables us to communicate quickly and effectively despite differences in language and reduces the opportunity for misunderstanding. Phraseology has evolved over time and has been carefully developed to provide maximum clarity and brevity in communications while ensuring that phrases are unambiguous.

Standard phraseology reduces the risk that a message will be misunderstood and aids the read-back/hear-back process so that any error is quickly detected. Ambiguous or non-standard phraseology is a frequent causal or contributory factor in aircraft accidents and incidents. International standards of phraseology are laid down in ICAO Annex 10 Volume II Chapter 5 [4] and in ICAO Doc 9432 – Manual of Radiotelephony [8]. Many national authorities also publish radiotelephony manuals which amplify ICAO provisions, and in some cases modify them to suit local conditions. Failure to use standard phraseology can lead to misunderstanding and breakdown

of the communication process.

Non-standard phraseology, which is sometimes adopted unilaterally by national or local air traffic services in an attempt to alleviate problems and is introduced after careful consideration to address a particular problem, can make a positive contribution to flight safety; however, this must be balanced with the possibility of confusion for pilots or ATCOs not familiar with the phraseology used.

Although standardized ICAO phraseologies [7] have been developed to cover many circumstances (essentially routine events, but also including some predictable emergencies or non-routine events), no set of phraseologies can fully describe all possible circumstances and responses. RTF users should be prepared to use *plain language* when necessary following the principle of keeping phrases clear and concise. Plain English proficiency is the ability to communicate in non-routine and emergency situations during flight – for example, when a passenger suffers a medical problem on board. It is crucial that pilots can convey these sorts of messages clearly and effectively and that they are received and understood by air traffic control so the appropriate actions can be taken. Therefore, plain English in aeronautical communications needs to be clear, unambiguous, free of colloquialisms, slang and idiomatic speech, and accessible to the international community of users [6].

Aircraft are flown and controlled by humans, and human behavior is infinitely variable; the need to communicate an infinite variety of circumstances or nuances will continue. Pilots and ATCOs need sufficient language proficiency to manage all of the potential requirements of communications, which can range from routine situations to circumstances not addressed by the limited phraseologies, as well as non-routine situations and outright emergencies.

As the language component plays such an important role in the professional activity of aviation operators, both scientists majoring in ELT and teachers are looking for new approaches aimed at improving the process of foreign language assimilation. We find the Context approach to be one of the most appropriate for language education of future pilots and ATCOs. Let's define its features and main applications for aviation operators' training.

The theory of context education answers on how to shift from the world of educational activity to the real world of professional activity. It is possible provided we (teachers) create pedagogical conditions for the dynamic transfer of students' activity from academic to professional, transforming the first into the second one. It does not require a point-to-point correspondence of student's activity to that of the professional (it's the easiest and wrong decision to turn a student into an apprentice of a manager, an engineer or a pilot, when the only possible way to study is observation or imitation). It's more important to consistently model in students' activity technological (profession-related context) and social (social context) components of the real professional activity of pilots and ATCOs. This way we can provide conditions for integration of different types of students' activity (academic, scientific, practical) [1].

To successfully perform duties of professional communication pilots and ATCOs should possess engineering (ability to analyze professional situations, set goals, choose proper means for solving technical problems, variants of optimal solutions, analyze and evaluate the findings, etc.) and speech skills. These skills comprise occupational (aviation-related) and speech components of aviation operators' professional competence. When developed, but not interrelated through the logic of professional activity and devoid of "efficiency" characteristics [3], engineering and speech competences often serve as certain psychological barriers relative to one another and prevent their instant integration in the operating process [2, p. 27]. This happens because the developed speech competences, in fact, prove to be linguistic, rather than specifically professional competences, and it usually takes much time to form a mechanism of efficient application of professional competences, which seamlessly include a speech component.

Communication of aviation operators inherently is not only a speech activity; it is related to and defined by information and profession-related environments. Besides, aviation operators should be flexible in switching from one language code to another. This, in turn, means that in addition to language competence and skills that characterize a polycultural linguistic identity, aviation operators

need the so called situational communicative competence, directly related to technological proficiency. Two components of the mentioned competence are distinguished: 1) profession-related speech competences, which allow to use speech algorithms, extract from the informative field relevant operational information about the technological process and operate its characteristics; 2) contextual speech competences, which provide an accurate understanding of linguistic information about dynamically changing operating situation, which, in turn, creates conditions necessary for crew decision-making. Formation of these competencies, according to A.O.Verbytskyy and V.F.Tenischeva means that operator's professional competence is characterized by operational efficiency quality [2, p. 28].

Professional activity of aviation operators (flight operators or air traffic controllers) lies in solving a row of "typical operating tasks" in a native or foreign language (A.O.Verbytskyy, V.F.Tenischeva). A typical operating task (TOT) is a generalized model of previous problem situations of native or foreign language communication, woven into the context of technological processes performed by aviation operators. It contains the indication of the purpose, features, deadlines, spatial accuracy of actions and expected results. Thus, the TOT has a complex structure, including technological, social, psychological, temporal and speech components.

According to the theory of context learning, professional competence of aviation operators will be successfully developed in case students' training aimed at speech competence mastery is included into the analog of their future professional activities. Thus, we should create an integrative model of training in which practicing of speech component (development of speech skills and competences) is realized in simulated technological processes of aviation operators' professional activity. This training is integrative, because it provides: 1) integration of the content area of language and profession-related subjects, 2) integration of real speech activity and simulated (in training) technological activity of future pilots and ATCOs, 3) integration of teaching of language and profession-related subjects; 4) interlevel integration of academic, quasi-professional and training-professional activities, 5) integration of reproductive and creative activities of students in situations of professional communication [2, p. 29-30].

The main *unit* of this integrative context training is a typical operating task, and its *goal* is formation and development of students' abilities for competent solution of the system of such tasks. Solving of every TOT stimulates students to speech activity, to usage of special linguistic material, this way students assimilate the material and operate it at the level of personal, social and professional meanings. In this case we can speak about a *combined training activity* (a special form of students' academic activity in which one type of activity is a means of solving profession-related tasks of another one) [1, p. 185]. A student in such cases is the subject of two activities – quasi-professional and speech. The basic prerequisites of combined professional activity are cognitive-professional needs of students. The key motive of quasi-professional activity is solving of professional tasks, while the key motive of speech activity is perception, processing, and production of professionally meaningful information. Quasi-professional and speech activities of students are united by common context, common space and logic synthesis.

Let's analyze those aspects of the professional speech activity of pilots and ATCOs that are important for organization of integrative context type training process. Professional speech activity of aviation operators is realized in conditions of full information and with its lack, which may be caused by both objective and subjective factors. Objective factors include: remoteness of communicators (no information can be obtained from facial expressions and gestures), brevity and abruptness of information reception, misrepresentation of information due to technical conditions (noise background), time pressure, information channel failure, multitasking. To subjective factors we refer low-level communicative skills of aviation operators.

The system of relations that arise in the combined training activity causes formation and development of students' professionally important qualities associated with speech activity. The decisive role in this process belongs to the professional context. With the help of quasi-professional tasks we simulate technological aspects of future profession; common activity and communication of future operators recreate its social aspects.

Information deficiency affects all key parameters of operators' activity, lowers quality of decision-making. Psychological similarity with air operator's profession is achieved in the training process by simulating conditions that cause information deficit. The latter can be achieved through different techniques: students receive operating information against the background of the "alien" radiotelephony communication; "flight communication" is complicated due to different non-standard situations (equipment failure, neighboring aircraft in distress etc.). Students should also be placed in situations of time pressure, be ready to solve all operative tasks and problem situations expeditiously and efficiently, within the specified (target) time. In this case we can speak about psychological context of aviation operators' professional activity. Experience to work in such conditions will contribute to the development of emotions and willpower of future operators, increase their professional reliability.

Recreation of technological, social and psychological aspects of future professional activity in the system of TOTs allows to form the structure of aviation operators' professional competencies associated with the speech activity.

The main forms of training in the integrative-context training of aviation operators should be: case-study, situational tasks and role plays. They allow recreating of integration processes and contexts, in which speech activity of students is a means of solving of simulated professional tasks.

Conclusion

Organization of the training process on the basis of the Context (Job-Specific) Approach allows bringing content and students' training process closer to their future profession. As a result, an integral system of profession-related, social and psychological skills (communicative, informational, analytical, instrumental, etc.) of future pilots and ATCOs is formed, facilitating their professional adaptation.

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Iu. Kurlin
Antonov ASTC (Ukraine)

TRIUMPH OF HUMAN FACTOR

The power plant's engine explosion of Australian aircraft A-380 during the flight detonated the breakage and failure of flight and navigation systems and equipment of the plane, but the crew of airbus coped with their task and landed successfully in Singapore Airport.

In the issue, the human factor was considered in a new way: ¾ of air accidents usually happen by reason of it. As a matter of fact, this situation states followings:

1. The syndrome of Titanic effect is going to act. Internationally recognized the Rolls-Royce motor crashed down in its most important part and proved the absence of the absolute reliability. It's necessary to apply every effort in order to keep dependability.
2. Warning system of A-380 outputted enormous quantity of commands and signals to be performed simultaneously and it was impossible to execute them at the same time not only for the crew but even for the sophisticated computer which could replace humans by itself in the air.
3. The Aircraft Commander, one in six co-pilots, used unconventional idea to make safe landing "to create light Cessna instead of heavy Airbus". The Aircraft Commander allocated correctly the tasks among co-pilots, used performance capabilities of heavy airliner and made magnificent landing of the plane which had exceeded permissible mass 40 tons.
4. The aircraft A-380 could prove its value and reliability, perfection of its systems and equipment.
5. The rescue team of Singapore Airport staved off danger in an extremely short time and prevented the fuel ignition of the airbus.

The event showed the huge force of man's spirit, due to which it was possible to succeed in solving a task, which a large computer complex of air bus A-380 failed to cope with in this situation.

In the event just positive informative placing became saving – to pilot an overloaded liner as a light «Sesna». Following the other solutions the plane would not just drag to the Air Strip.

In most of accident situations with a tragic outcome there was a negative information in which the crew appeared to be «as in a trap» It happened to «Ruslan» in Irkutsk where Pilot In Command chose the direction to the city for some reason, and the board engineer turned off the other engine by mistake after failing of one engine working properly, making an accident situation.

The head of the Polish plane TU-154 oriented on the altimeter indicator in the approaching zone, where the locality was 20-30 meters lower than the Air Strip level and the difference appeared to be fatal for the crew and the passengers.

An experienced test pilot colonel V. Toponar being above Sknilov airport (Lvov) on SU-27 unexpectedly decided for himself «to lose the height » in the manoeuvre which the hadn't worked out and this finished in the tragedy.

The captain of Moscow AN-32 in Kinshase (Zaire) after arguing with a board engineer didn't notice the plane flying off with a standing braking, which ended in the death of 350 innocent people.

These examples lead to the conclusion that the outer information rules the crew and it either saves or destroys depending on the reaction of the crew.

The definite analysts ascribe the appearing of information to plastonoids which test the crew.

Digital cameras fixed little distinctive plasmoids in the places where the crews fulfilled demonstrative flights and an unlucky one in Lvov (SU-27) and a safe one in Gostomel (AN-225) «Mriya».

The admission of so-called Thin World existence by specialists-psychologists surely contradicts generally accepted views and demands their radical revision, however it rather facilitates opening of the essence of influence of the inner information on the crew actions.

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V. Zholdokov, Ph. D.
(UN, Switzerland)
T. Shorina, PhD, Senior lecturer
M. Abysova, PhD, Assist. Prof.
L. Orokhovska, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

GLOBALIZED RISKS OF THE MODERN WORLD: TERRORISM AND AVIATION SECURITY

The complexities of providing aviation security in the face of the transnational terrorism as a global risk of the present time in the conditions of a post-cold war era are analyzed in the article.

The retrospective view of XX century history after the end of World War II allows to draw a conclusion about rather stable decades in the life of the world community. It is paradoxical, but the USSR and the USA – two world superpowers in the "cold war" state – were the guarantors of peaceful co-existence and military-political balance of international forces. The balance of the international system was profoundly shaken since the middle of the 1970th, coinciding with the beginning of the arisen world political and economic crisis. The disintegration of the USSR and its block provoked the collapse of the world order. As a prominent British historian, the researcher of «the short XX century» E. Hobsbawm notes that the idea of withholding of the new world order by the remaining world predominant force – the USA – "turned to be inconsistent" [7, p. 277]. Washington's political and military domination in Europe occurred in the context of its reducing economic superiority. For instance, the short-term war in the Persian Gulf of 1991 in Iraq carried out by multinational forces under the leadership of the USA, revealed that military hegemony of the USA couldn't be more financed only from internal resources of the country, and needed allies' participation. The crash of world bipolar system made vivid the frozen contradictions and the conflicts of local and regional scales, including aggravated contradictions in political systems of the international states.

Cardinal changes of the geopolitical world landscape were at the same time accompanied by formation of global economy for which the sovereignties of the states, their territory and borders became the factors making economic movement problematic. Economic and political weakening of the national state institute caused, on the contrary, strengthening of ex-territorial extra state formations leading to extending transnationalization of economy, three aspects of which were allocated by E. Hobsbawm: transnational firms /…/, new international division of labor and growth of offshore financial streams [7, p. 300]. Interdependence of world economy, production, social, information, technical communications and systems, on the one hand, causes the integration of societies in the uniform capitalist World-system (I. *Wallerstei*n). On the other hand, economic globalization is a reason of cultural, national, ethnic, religious, style and other varieties which opens the question of the common former "narratives" and structural values. The collision of various economic structures, modifications of cultural and axiological matrixes in the uniform World-system when the role of political institutes is weakened makes the phenomenon of globalization be a difficult and dangerous construction. Globalization produces global risks, as interdependence assumes intervulnerability: any local events in the world of such a type in accordance to "dominoes" principle can get a global resonance and cause consequences global on their scales. The opposite is also true: globalization enters every home, shapes any individual biography. As a result – "local" events have global foundations and act as their indirect print.

Global problems have a planetary character; their solution depends on efforts of the whole world community. Among global problems one conditionally allocates three groups: problems coming from society–nature interactions (environmental, energetics, raw problems, etc.); problems connected with man–society interactions (problems of population, education, health care, morality);

problems of basic social communities of the mankind, or intersocial problems. The last group, along with problems of poverty, threat nuclear, bacteriological and others, includes the problem of peace and justice, the problem of terrorism which represented itself in a new way in the last third of XX – the beginning of XXI cc.

Investigating terrorism history since the first class societies, scientists note that the terrorism has passed its evolutionary chain: from an individual terrorism to – group – local – mass terror [3]. The terrorism in its mass updating turned into a serious global disaster. Say, experts in the field of reconnaissance and fight against terrorism know that in the case of Islamic terrorists, the acts of terrorism won't be aimed exclusively at barracks or embassies to put some hundred victims to death but cities and the whole countries might be their targets. Analyzing the nature of the mass terror, a known Russian scientist D. Olshansky, pays attention to the fact that to be truly mass in nature terror shouldn't be simple directing against masses or being carried out by masses concerning others, but it happens when the violence generates violence, and terror is untwisted on a spiral, involving more and more broad masses [3].

At the level of the mass consciousness the reality of threat of mass terrorism in the social and psychological plan promotes negative emotions: hopeless, often unaccountable fear and horror, despair, confusion, helplessness, a panic. Helplessness and confusion at the same time promote trustfulness and suggestibility increasing from the organized forces which can use this weakness, manipulating consciousness and lives of people in the benefit of their private or declaratively public interests. Such a force demonstrating rescue and ensuring of interests of citizens, can be either the state, its security and law-enforcement agencies, or groups of an antistate orientation in or beyond the country. As psychologists say the one who keeps the population in fear and uncertainty shows the power over society as a whole [5, p. 40]. Interests of both terrorists and contr-terrorists using a terror as an extreme instrument of sociopolitical fight may coincide in achieving of the purpose to have power over the society.

The mass terrorism in its complete – globalized – kind is presented by acts of terrorism of the international character and as a whole by international terrorism. In its positive value globalization "democratizes" the world dialogue, giving a possibility to be heard and stated to any who enters its orbit. For this reason in this "flat world" (Th. *Friedman) not* only Infosys Technologies Limited as a symbol of the information era but also destructive for civilization bases "al-Qa'ida" can be heard. Using globalization achievements, its communication media and technologies, a terrorist makes this world of "publicity" draw its attention to him. As Russian researchers stress that the terrorism is created today in the front of hundred thousands photo- and movie cameras, being a work of art, a show, a movie [6, p. 136]. The modern terrorism is only possible with the help of feedback. Its indifference to the choice of victims could be explained by its purposes – to crush the "System" by means of hostages, to demolish this or that state, interstate communications, or statehood model in general, etc. As a System kills a terrorist, so he kills It in return in the person of hostages.

The international terrorism reflects the globalized character in the organization dimension too. The basic place in it is occupied by principles and technologies of the network communication, allowing not to have an obviously shaped command center, not to be adhered to the certain territory, etc. Usage of network principles of the organization is supplemented with active exploitation of informal links of members of the organization with private persons who don't belong to the organization and even unwillingly can be involved in the activity of the network terrorist organization. In organizations of such kind the activity is carried out by self-ruling groups while external relations can be built in accordance with standard social norms and even to the legislation of those countries in which territory the organizations exist. Thus, formal signs of terrorist or criminal activity can be hidden until the moment the organization will start to act [2, p.70].

According to U. Beck, the author of the "global risks" concept, "universalization of terrorist threat to the states of the world turns fight against global terror into the challenge to big politics: new alliances are created over borders of camps resisting each other, regional conflicts are settled and that makes cards of world politics being shuffled anew" [1, p. 12]. Being considered before effective measures of traditional institutes of the power turn to be inefficient in relation to terrorist

acts which don't suit "national jurisdiction".

Weakening of the state international system as a main and legitimate agent of the international relations, weakness of global political structures, and in result the lacks of ways of the political solution of the present conflicts lead to illegitimate political actions. The terrorism, according to a number of scientists, is similar to the social protest, revolutionary movement which is carried out in the conditions of / … / depoliticization. At the same time the terrorism is similar to a new type of war which not always continues policy of the state [4, p. 34].

It is possible previously to conclude that the international terrorism resists to the state systems as an informal type of the organization – to the formal one. In such a form of links it becomes impregnable, and power methods of fight against it and formalized systems of safety which involve the states, uniting them into a coalition, turns to be half measures: they can reduce, but not prevent terrorist threats.

On the other hand, the modern terrorism isn't alien to society. In the world in which, according to U. Beck's belief, European monopoly for modern completely ended [1, p. 13] and there is no more hegemonic country or the conventional domination of any political, economic system or, a way of life, terrorism represents *alternative* or *other* type of a public assessment and practice. And in this sense it is incorrect to allow one-sided terrorism considerations from theoretical positions of «under-men» or «human garbage».

Say, the Islamic world, which culture is based on restoration of communal identity contrary to personal or national identity, shows its ambitions on the question of creation of global political system which will offer an alternative option of globalization. The Ummah can make a claim for the status of the foundation having state legitimate functions.

The tragic events of September 11, 2001, connected with explosions of skyscrapers in New York and mass death of the civilian population fully demonstrated a social discrepancy of estimates of acts of the international terrorism. Except the international condolence towards the USA there were other, opposite, reactions, first of all, of the Islamic world which generally considered these terrorist acts to be the ones of establishing of «historical justice». Even American experts, Olshansky reminds, agreed that USA operations against Grenada, Panama and others, bombings of Yugoslavia and other / … / caused hate in many countries of the world. The policy of this kind inevitably should provoke rigid actions in return, what happened [3].

After attacks 9/11 the world community started talking about a mass danger of the international terrorism, and, first of all it was the question of Islamic fundamentalists' terrorism. Namely their organizations, experts believe, occupy a leading place in the modern world. The scales of their victims allow comparing Islamic fundamentalist organizations to regular military forces. Even 10 years later after acts of terrorism the USA in the counterterrorist national strategy define that their principal focus «is the collection of groups and individuals who comprise al-Qa'ida and its affiliates and adherents» [9, p. 3]. In the program it is, however, specified that the USA lead war not with the tactic of terrorism or Islam religion, but with a specific transnational terrorist organization responsible for planning and carrying out the attacks.

Among forms of modern international terrorism one distinguishes the following ones: unsolemn wars, export of revolutions and counterrevolutions, political murders, explosions, abductions, beatings and mockeries, robberies of banks, jewelry stores, capture of planes, ships, capture of public institutions, embassies and others.

Let's discuss in detail threats to civil transport safety, in particular, to aviation safety. As events 9/11 clearly showed the leading state of the world and its defensive departments failed to prevent this act of terrorism, and the way of its implementation − hijacking civil airliners. The airliners exactly were used as weapons for committing that terrible crime.

The cause of the vulnerability of civil aviation objects is well known. It is a large amount of people passing through airports everyday. This presents potential targets for terrorism and other forms of crime. Similarly, the high concentration of people on large airliners, the potential high death rate with attacks on aircraft, and the ability to use a hijacked airplane as a lethal weapon may provide an alluring target for terrorism.

Generally, the appearance of terrorism has practically concurred with the rise of aviation as a mode of transportation. The first registered incident of aviation terrorism goes back to 1930, but the starting date of modern aviation terrorism, when it applied as a tool of political pressure and propaganda is 22 July 1968. Despite the drastic peculiarity 9/11 could be contrasted with previous aviation crimes with hijacked airplanes as an event, when for the first time the airplanes were steered by suicide pilots instead of being employed as leverage for negotiations or as a platform for putting forward demands. Immediately after the attacks, note Americans experts, security issues rose to paramount importance in the nation's policy Agenda.

Nowadays the attainment of a safe system is the highest priority in aviation throughout the world. In the international air law the principle of ensuring the international civil security fixed in its two aspects: technical and social (protection of international civil aviation against acts of illegal intervention). A specialized agency of the United Nations, the International Civil Aviation Organization (ICAO), that sets standards and regulations necessary for aviation safety, security, efficiency and regularity, determines aviation security as «a combination both human, and material resources and appliances intended for protection of civil aviation from acts of illegal intervention» [11]. Despite general agreement on what aviation security entails and the goals of an aviation security system, public controversy abounds *on how to regulate and provide this important activity.* For instance, J. Arasly, a member of the PfP Combating Terrorism Working Group suggests the next matters and some recommendations relating to the struggle against terrorism from the perspective of civil aviation: 1. *Improvement of the air transport security system*; 2. *Improvement and introduction of technical protection measures for aircraft.* Provides for the use of electronic means of protection against MANPADS launches; 3. *Introduction of preventive measures aimed at averting acts of terror.* This would include the creation of databases on potentially dangerous passengers; more stringent pre-screening for members of radical political organizations, religious sects, criminal groups, those who are already or likely to become intoxicated, those skilled in hand-to-hand combat, etc., and more thorough vetting of flight crews and technical personnel employed by the airlines; 4. *Coordination of efforts and expansion of interaction between civil aviation bodies and state security services.* This would involve forging closer ties between airlines and civil aviation authorities and the armed forces, special and secret services, law enforcement, immigration, and customs agencies within the framework of combating international terrorism and organized crime; 5. *Improvement of the international legal mechanism of counteracting aviation terrorism*. /…/ 6. *Expansion and deepening of the interaction between relevant professional structures at the regional and international levels.* This includes rendering organizational, financial, and technical assistance to separate states that are located in areas of heightened risk in terms of air transport and traffic operations [8, p. 88-89].

Unfortunately, specialists recognize that there is no such thing as 100 percent prevention. In particular, J. Arasly acknowledges putting suggestions into effect is difficult not only from the organizational and financial standpoint, but also on political, moral, and ethical grounds as well. Taking fingerprints and scanning retinas of airline passengers, and using armed air marshals on flights are all adverse to the principles of democracy and individual freedom. This is one of the numerous negative consequences of the phenomenon of international terrorism. To establish safe security measures is difficult and often not impossible for another reason. There are literally millions of potential targets in any large country. Thus in the USA there are 5 mln commercial buildings alone and hundreds of potential terrorist tactics. It's impossible to defend every place against everything, and it's impossible to predict which tactic and target terrorists will try next. So it causes some consequences. Among them is the problem of economic wastes. Nowadays the war with terrorism is extremely unprofitable: for each terrorism cents counterterrorist forces waste billions of dollars. Another one consequence connects with the reactive mode of the official responses on terrorist attacks. As compare one American journalist Br. Schneier their current response to terrorism "is a form of "magical thinking." It relies on the idea that we can somehow make ourselves safer by protecting against what the terrorists happened to do last time" [12]. The terrorists always have the advantage of the first motion.

Since 9/11 security throughout the world has had an effect on the number of hijacking attempts and airline sabotage attempts. There is no question that, as a consequence of screening measures and other factors, the number of attempts by terrorists has significantly declined over the years. As Br. M. Jenkins, a senior advisor at the RAND Corp. and a former member of the White House Commission on Aviation Safety and Security, notes in the 1970s and 1980s the officials were looking at a terrorist hijacking or an attempted terrorist sabotage of an aircraft something close to once a month. Despite at the post-9/11 environment /…/ we're looking at one of these incidents per year [10].

Conclusions. Indeed the world community has made much progress to aviation security for the last decades. But each specialist on the nature of modern terrorism and system of security recognizes the futility and vainness of the attempts to annihilate the terrorism at all. More effective struggle against terrorism is to eliminate the potential reasons of the terrorism. Much more productive is to advance warning of it rather than fighting to it, when it rises up to the serious threat. There are at least five fundamental reasons of the terrorism – ideological, religious, social, political and geopolitical. The world community should comprehend these reasons and press towards to remove the difficulties.

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L. Baranovska, Dr. Sc., Prof.
O. Berezhko, Aviation English Instructor
(National Aviation University, Ukraine)

HUMAN FACTOR AS A KEY ELEMENT OF AVIATION SAFETY (IN TERMS OF ICAO AVIATION ENGLISH INSTRUCTORS PROFESSIONAL ACTIVITIES)

Human factor as a key element of the Civil Aviation Safety is described and the importance of meeting the requirements concerning the adequate level of pilots and air traffic controllers professional qualities (language proficiency in particular) is outlined in the article. The ways to strengthen Aviation Safety by improving the system of aviation specialists and Aviation English instructors continuous training are defined.

A person is a crucial factor for the development of aviation industry as it is particularly he who designs an aircraft, takes part in its testing, certification and operation. Even if unmanned fully automatic aircraft has quite a lot of advantages, a passenger will always feel more comfortable on board of the aircraft controlled by an experienced, competent pilot rather than by a robot or some programmed system that may fail and are unable to work flexible in the unexpected turn of events.

Furthermore, according to the statistics of International Aviation Committee, more than 70% of aviation accidents and incidents taking place on the territories of the former Soviet Republics result from human errors. Therefore, the study of humans' performance, capabilities and limitations and human factors concept has been challenging and of the interest for decades among the people responsible for the design, operation and management of the aviation system.

The aim of the article is to define the notion and the significance of human factor issues in aviation and to describe the importance of Aviation English instructors in the system of improving the aviation specialists' professional competence in accordance with the ICAO requirements. The study of human factor in aviation is aimed to solve practical tasks, namely to enhance the flight safety and increase the efficiency of aviation industry in general. For better understanding we will clarify the meaning of this multidisciplinary phenomenon that is widely used in different fields. A factor, a Latin word meaning 'who/which acts', in science refers to a cause, an impelling force of some process that determines its character or at least one of its characteristic features.

Approximately a century ago Vladimir Ponomarenko, an honored President of the International Academy of Human Issues in Aviation and Space Exploration, Russian psychologist, Doctor of Medicine, professor, introduced into the process of professional and psychological selection of aviation specialists a new term "personal/individual factor" that includes "individual's native and acquired features, the field of willpower and emotional characteristics, features of character, abilities and skills, interests, tastes and habits, ethics, physical and mental state of a particular person that can be a contributing factor to some definite aviation event" [2].

Nevertheless, at the end of 1920th and at the beginning of 1930th the scientists realized that far not always human errors happen due to the individual peculiarities. Even a physically and psychologically healthy person can make a mistake due to poor ergonomics of the cabin, flight efficiency demands imposed by the managers that do not pay attention to the optimization of the workload and rest. Thus, the leading cause of one third of the errors is poor ergonomics, designers and manufacturers deficiencies and poor psychological and methodological preparation in the process of recurrent trainings. A part of the mistakes occur due to person's individual psychological barriers and limitations, physical fitness, fatigue, stressors, noise, distraction, etc. Subsequently, the term "human factor" that denotes the interaction of humans with their working (and living) environments (i.e. with providing solutions for a "good fit" of humans to their environments) was introduced. In general, a human factor is a physical or cognitive property of an individual or social behavior which is specific to humans and influences functioning of technological systems as well as human-environment equilibriums.

Theoretical and methodological basis of human factor study were done in 1970th - 1980th by the Soviet scientists such as: V. Antonenko, M. Kagan, O. Ilyin, M. Dobrotvorskyi, A. Uledova, G. Osypova, V. Shynkaruk. Most modern Russian scientists, namely N. Abramova, M. Absava, T. Zaslavska, Z. Bakayeva study human factor in the economical and management spheres.

Human factor notion is used in wide range of sciences: philosophy, sociology, psychology, medicine, management, etc. Therefore, there is no unanimity concerning its meaning.

In the field of Aviation human factor is about people in their living and working situations; about their relationship with machines, with procedures and with the environment about them; and also about their relationships with other people (at work). In aviation, human factor involves a set of personal, medical and biological considerations for optimal aircraft and air traffic control operations [3]." The primary concerns of human factor are an understanding of the predictable human capabilities and limitations and the application of this understanding.

As a multi-disciplinary approach, human factor draws knowledge from a broad range of academic disciplines, such as psychology, physiology, anthropometry, biomechanics, biology and chronobiology, design, statistics etc. Besides, the study of human factor is closely connected with Pedagogy, Physics, Biochemistry, Mathematics, manufacture design and aircraft operation.

Scientific and technological progress results in the fast aircraft automation that leads to “real complication and sophistication of the working activities and the work intellectualization” (O.M. Leontyev) and transition from “perceptual and movable to perceptual and meaningful activities” (A.A. Krylov). Flight work is dynamic, complicating and dangerous, as pilots have to control flight parameters and changeable weather conditions at different flight displays, carry on radiotelephony communication and make decisions quickly taking into account all flight data. Therefore, information overloading, work under pressure and strict time frames (as the aircraft has limited quantity of fuel and flies very quickly in the three-dimensional space and has no opportunity to make a stop wherever it is needed) are the main leading causes of human errors. Subsequently, the improvement and constant development of the professionally important qualities have become of the primary concern. All applicants for the studies at the aviation higher educational establishments are selected on the basis of the strict medical and psychological requirements.

The professionally important qualities of the aviation specialists are divided into five groups: *personal, intellectual, psycho physiological, physiological and physical*. The first group includes moral (decency, honesty and responsibility) and social (sociability, leader potential, intention for the continuous self-improvement) qualities, ability to conduct an adequate self-assessment, adaptability and professional motivation. Pilots’ intellectual qualities include the abilities to get oriented in a complex spatial environment, to take effective measures in terms of time shortage and imposed work rate and an ability to switch one’s attention rapidly. As for the physiological characteristics, they include neuro-emotional stability, and resistance to flight fatigue, monotony and to work in a forced pace. Physiological qualities include vestibular tolerance, overloading and other specific flight conditions tolerance. Among the physical characteristics strength, speed, endurance, anthropometric qualities are distinguished. V. Ponomarenko considers that the most important qualities for pilots safe aircraft operation are intelligence, spatial orientation, will, operational thinking, flexibility and dynamism of the nervous system, appetite for risk". On the contrary, among the intolerable qualities are the emotional excitement and lack of attentiveness.

Moreover, factors influencing performance include:

a) Physical fitness.
b) Physiological characteristics such as visual acuity, colour vision, hearing, etc.
c) Personality.
d) Attitude, professional integrity, motivation.
e) Arousal level, low arousal (boredom), excessively high arousal (stress), stressors.
f) Alertness, fatigue, tiredness, shiftwork, sleep, circadian rhythms.
g) Distractability, attention span, concentration, multi-tasking ability, situation awareness.
h) Information processing capability, memory, perception, intelligence.

i) Knowledge level, awareness of knowledge level, experience, recency.

j) Cultural influences, company culture, national culture, norms.

The necessity of a continuous improvement of pilots and other aviation specialists' professional skills requires definite measures. The Human Factors Training Manual (Doc 9683) uses the SHEL model (the name being derived from the initial letters of its components: Software, Hardware, Environment, Liveware). This model was first developed by Professor Edwards in 1972. The following interpretations are suggested: liveware (human), hardware (machine), software (procedures, symbology, etc.), and environment (the situation in which the L-H-S system must function). In the centre of the model is a person, the most critical as well as the most flexible component of the system.

Considering that there are four types of interaction, namely: human – machine (L-H); human – procedures (L–S); human – environment (L-E) and human-human (L-L), in order to enhance Aviation Safety all of them are to be taken into account in the process of selection , initial and recurrent training of aviation specialists.

Quite a lot of attention has been paid to the requirements concerning the aviation specialists trainings, though it is spoken a little about the competence of instructors' who develop and conduct the trainings. Let's study the example of language proficiency requirements.

Communication problems have been a contributing factor to the aviation incidents and accidents for a long period of time and the investigators and aviation authorities underlined the importance of solving this issue with a purpose to improve Aviation Safety. Subsequently, after long going process of investigation and researches in 2008 the International Civil Aviation Organization (ICAO) adopted the language proficiency standard that requires each pilot and air traffic controller that work at the international airports to have the command of English minimum at the 4th Operational level in accordance with six descriptors of the ICAO Rating Scale. The Record issued by the State Examination Board regarding the knowledge of English is valid for 3 to 5 years depending on the level. Therefore, pilots are offered and requested to pass annual language training. Considering that a foreign language is skill that requires constant practicing, pilots and ATCs are supposed to study at the periodical English training courses that help them to maintain their level and refresh the knowledge. The requirements towards the language proficiency and testing procedure are described in details in different document, nevertheless there can hardly be found enough information regarding the instructors competency and job fitness and recurrent trainings. Though the effectiveness of education depends on the instructors' competency and adequacy not much attention is paid to their level maintainability and sustainability. We strongly believe that rapid development of aviation industry, development and implementation of new automatic systems and devices primarily require the appropriate, obligatory, regular and controlled training/testing of the Aviation English instructors. Such measures will reduce the possibility of inadequate professional level of the instructors and inspectors, will help to keep them up-to-date and will increase the effectiveness of the aviation personnel training enhancing the Aviation Safety.

Whereas, the human factor is an integral part of aviation, we believe that incorporation of this concept in the process of curriculum and training development is required. Firstly, teachers, and then the aviators must understand properly the nature and importance of this concept.

In accordance with the ICAO Circular 217-AN/132 the Human Factor Training should consist of three stages (awareness, practice and feedback in the line oriented flight training and knowledge reinforcement) and should cover six domains, such as [3]:

1. Communication skills/interpersonal relationship (cultural influence, barriers overcoming (e.g. age, crew position, etc.), assertiveness, participation, listening, feedback).
2. Situation awareness (total awareness of surrounding environment, reality vs. perception of reality, fixation, monitoring, incapacitation (partial/total, physical/psychological).
3. Problem-solving/ decision-making/judgment (conflict resolution; review (time-constrained).
4. Leadership/followership (team building, managerial and supervisory skills, authority, assertiveness, barriers, cultural influence, roles, professionalism, credibility, team responsibility).
5. Stress management (fitness to fly, fatigue, mental state).

6. Critique (three basic types: pre-flight analysis and planning ongoing review, postflight).

7. Interpersonal skills (listening, conflict resolution, mediating).

The work on such domains not only at the practical trainings but also at the English classes will help to reinforce the important skills and will improve the effectiveness of the flight crew.

Taking into account Human Factor, manufacturers and aviation managers are trying to do their best and by flight cabin automation improve the well-being of crew members and enhance the industry effectiveness, namely in regards to safety and efficiency. Though there are always two sides of the medal and the implementation of new systems or technical devices may lead to appearing of new problems and difficulties. Therefore, the appropriate training is necessary to work in accordance with the pro-active not reactive approach, to prevent the errors that may occur.

It is important to remember that the competence under the normal work conditions may differ a lot from the competence in the stressful situation with a high workload. Therefore, a particular attention has to be paid to the aviation personnel continuous, periodic improvement of professional qualities, their skill are to be perfected systematically at the line-oriented flight trainings. And the matter of Aviation English Instructors recurrent trainings is to be addressed at the both national and international levels.

Moreover, according to the international statistics three forth of the accidents and incidents happen due to the inability of flight crew to make use of readily available resources, namely due to poor group decision-making, ineffective communication, inadequate leadership, and poor management. In the response to such statistics more attention has been paid to the factors which influence crew co-ordination and the management of crew resources. Briefly, cockpit resource management (CRM) that is an effective use of all available resources, i.e. equipment, procedures and people, to achieve safe and efficient flight operations [4], has been implemented. CRM training focuses on the functioning of the flight crew as an intact team, not simply as a group of technically competent individuals; on the practice of the skills and knowledge that are of a crucial importance in the stressful unexpected turn of events. It increases the probability that a crew will handle actual stressful situations more competently. Both linguistic competence (knowledge of Aviation English) and psychological aspects deserve particular attention and are to be improved.

Conclusions

Humans have always been and will remain responsible for the management, operation and provision of flight safety. Therefore, the studies and researches concerning human factor are to be done and taken into account in the process of aviation personnel initial and recurrent training. Poor communication as a contributing factor to aviation accidents and incidents should be eliminated primarily by the proper continuous training of Aviation English instructors and secondly by the pilots and air traffic controllers trainings. It will increase the effectiveness, productivity and reliability of aviation system.

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Ui. Usachev, PhD, Assoc. Prof.
V. Zinchenko, PhD, Prof.
V. Biletskaia, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

FORMATION OF FITNESS – CULTURE OF STUDENTS IN TRAINING-HEALTH ACTIVITIES FAVORITES SPORT

The article deals with current issues of formation of the fitness culture of high school students through the application of modern educational fitness programs and technologies.

The need for a balanced system of education and physical education due to many reasons. With each passing day increases the flow of new information, there is a lack of free time for physical activity, worsening health status of young people, reduced the level of physical fitness [2].

The current problem situation points to the importance of studying the factors that ensure a high level of mental and physical performance in the learning process in higher education, the need to study patterns and the relationship between the level of physical activity and mental characteristics of the students. Increasing the flow of information, the need for its treatment in the short term, the use of various means of training entails the constant intensification of educational process in higher education. This leads to a significant reduction in the amount of free time for students [3].

Extremely intense mental activity and progressing with each passing year, lack of exercise, lead to the fact that indicators of functional state of the body systems and physical performance of students significantly decreased from younger to older courses. This situation is further complicated by the fact that in the ranking of values among students of health is very modest [2].

The formation of social and active person in harmony with the physical development is important for preparing high school graduates for professional careers in the community. It actualizes the problem of improving physical education and raises its prestige in high school. In this connection a question arises about the direction of formation of the fitness culture of the students in higher education.

Working the curriculum of higher education in the discipline "Physical Education" provides for a profile of the modern theory of didactic material and methodical nature, as set out and implemented in accordance with the requirements of credit-modular system of training. Of particular importance is the content of technology education and build self-study using the necessary amount of physical activity from the arsenal of means of improving fitness in the formation of boys and girls have a strong motivation for physical education and sports as an important factor in the formation of the fitness culture of college students [2].

A variety of fitness exercises which are the basis of objective fitness culture and provide students the freedom to choose different kinds of sports and physical activity. Integrative and combinatorial fitness culture allows you to combine popular and effective for the improvement of students moving and sports, aerobics, circuit training nature, stretching, etc. The relationship of different areas of fitness with the fundamentals of physical education, traditional and new forms of art, national and regional traditions allows you to create a modern youth culture type of society - the fitness culture of the students [2, 3].

Experience with students of the National Aviation University, studying the discipline "Physical Education", shows that the most efficient form of organization of educational and recreational activities is the distribution of first-year students to the methodological associations with the primary use of the chosen sport or recreational physical activity.

This approach allows students to focus purposefully to physical culture and sports with personal experience of sports activity, which ensures the proper level of motivation, the availability of interest to higher level of physical fitness, participate in competitions, referees and instructors

practice. As evidenced by the results of special studies, the students involved in this way have usually score higher on the credit requirements of discipline "Physical Education", overall academic performance, easier to adapt to new social conditions of student life.

The purpose of this paper is a synthesis of scientific and methodological materials for the educational process with the students of I year of the Aerospace Institute of the National Aviation University in the development of popular sport, "ping pong".

Training sessions were conducted in accordance with the thematic plan of discipline, formed by two semester modules: "Physical education, general and special training of students" and "Improving the physical state in the mode of life of students." Their contents include theoretical and practical topics, as well as the preparation and writing of modular work.

In the process of learning and self-study students studied the methods of the theory and methodology of physical education and sport. Special attention was paid to various aspects of training in table tennis [1].

The bottom section includes a means of general physical training of students, the basics of self-control in the classroom, the change of control standards, as well as the special physical, technical and tactical training tennis (racket grip, tennis rack, move the table, performance feeds, punches, playing singles and doubles participation in the competition).

An analysis of the level of overall physical fitness of students based on teacher testing found that the weakest of its components are the explosive muscle strength and general (aerobic) endurance, determined by the regulations, "the long jump from their seats" and "sprinting." Accordingly, in the learning process included special exercises for the development of these motor qualities.

It should be noted that the revealed (weak) links of general physical preparedness is not an objective obstacle to targeted training sessions in table tennis for the contingent, and, moreover, allowed the students to realize their physical potential is relatively low in this methodical association.

Analysis of the baseline (initial studies of I semester) and repeated (end of semester II) levels of physical health and overall physical fitness of students showed no statistically significant differences were considered indicators. This is due to an insufficient number of training and self-study (1-2) within one week microcycle, providing a supporting effect of training effects. This fact, in accordance with the basic provisions of the construction of conditional training, identifies the need for at least 3-4 sessions with the contingent, which has a low and medium levels of physical condition.

Skills of self-perfected physical performance of students in the process of familiarization with the methodology of sample Rufe. The first phase covered the conduct of research under the direction of the mass of teachers, in which the students mastered the methods of determining heart rate, how to perform dosage calculations and load factor. This procedure was repeated independently by students at the first and second stages in the process of individual lessons.

Total covered 156 students I rate the National Aviation University (97 boys and 59 girls) aged 17-18 years who started regular training and self-employed physical culture and sports. These results indicate a satisfactory level of physical performance in boys (R = 10.2) and girls (K = 12.3), which determined the selectivity and direction of the general and special physical training within the boundaries of I and II semesters of the school year.

Mandatory part of the training work program in physical education for students of the course I of the National Aviation University, is a theoretical and methodological material that forms the content of unit tests.

Analysis of the baseline (initial studies of I semester) and repeated (end of semester II) levels of physical health and overall physical fitness of students showed no statistically significant differences were considered indicators. This is explained in the semester, I was the main task of mastering the material on the theory and methodology of the basic physical skills and motor skills, determining the level of overall physical fitness. For particular questions in this section were:

1. Basic methods of power quality. General characteristics of the power (absolute maximum,

explosive). Ways to develop strength endurance (for example, the test "flexion and extension of hands-ups"). Controlling the level of power quality.

2. Basic methods of speed. General characteristics of the speed (the speed of the motor reactions, the rate of single movements, the frequency (rate), uncomplicated movements). Funds development of speed (for example, the test "running 60m"). Controlling the level of development speed.

3. Basic methods of endurance. General characteristics of endurance (general and special endurance). Means of general endurance (for example, the test “run 10 minutes”). Controlling the level of endurance.

4. Basic methods of flexibility. General characteristics of flexibility (active, passive, dynamic, anatomical flexibility). Means of developing active flexibility (for example, the test "torso forward from a standing position"). Controlling the level of flexibility.

5. Basic methods of agility. General characteristics of agility. Criteria for agility. Means of control and level of special skill (for example, the standard of table tennis).

The second section of the modular examinations formed the basic questions about the provisions of ping pong as a favorite type of physical activity:

1. History and Development of ping pong.

2. How to play ping pong.

3. Technical equipment of table tennis.

4. Filing in ping pong. Classification of feeds. The rotation of the ball, the factors determining it.

5. Grip the racquet, its variants. The main reception tennis. Play areas and moving around the table.

The content of job control module works in the II semester were the following questions.

1. Needs, motives and interest in physical culture and sports students (response concepts, especially the personal motivation).

2. Factors for healthy lifestyles of young people (rational mode of the day, a balanced diet, the amount of physical activity, disease prevention, resistance to stress, lack of bad habits).

3. Features of work and requirements for physical fitness experts chosen profile (vocational and applied physical training).

The level of students' knowledge on the theory and techniques of special physical training in "ping pong" estimated the answers to these questions:

1. "Ping pong" - Olympic sport competition program, the country's leaders, the strongest tennis players of Ukraine, World, Europe.

2. The content of the preparatory training sessions (warm-up tennis player).

3. Special tools and methods to improve techniques and tactics of the game of ping pong (supply, impacts, two-way game). Moving and rules of the game in the doubles.

Estimates derived from the completed unit tests, is an important component in the student's overall assessment of the students and encouraged them to self-examine these issues in the literature and the Internet.

A promising vector research in this area should consider the development of educational technology teaching the fundamentals of the theory and practice of selected types of physical activity, taking into account gender and level of athletic fitness of students.

Findings

1. Physical education at the university, as its basic form, is intended to contribute to, first of all, the elimination of variations in health status of students, a comprehensive physical development, education of professionally significant qualities and abilities, eliminating the possible harmful effects of objective conditions on the student's educational process. One way of improving physical education students is the introduction of various types of physical activity that students choose, depending on the needs and interests, which contributes to a culture of fitness, increase motivation for recreational pursuits and sports orientation.

2. The formation of social and active person in harmony with the physical development is important for preparing high school graduates for professional careers in the community. This problem requires improving physical education and raise its prestige by improving the quality of organizational and managerial activities, which are an integral part of certain types of educational and methodical work, in particular the development of programs for the "physical education" for students of different areas of training.

3. One of the conditions for increasing the effectiveness of the physical education of students is the presence of variable modules for different types of physical activity, which increases the motivation for sport and recreational pursuits and employments, sports orientation.

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O. Blinov, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

USE OF AUTOGENIC TRAINING BY PARATROOPERS IN PREPARATION FOR AND EXECUTION OF PARACHUTE JUMPS

The author defines challenging aspects of enhancing emotional stability of paratroopers for parajumping execution. Psychological factors and professional activity features of servicemen of aero-mobile troops are also described. Methods of autogenic training, which are used during airborne preparation, are adapted to conditions of their operation. The results of empiric research of autogenic training use by paratroopers are presented.

The core element of professional activity of servicemen of aero-mobile troops is preparation for and execution of parachute jumps. They are associated with the impact of various stress factors on the human organism, the key ones being psychological: a permanent element of risk and threat to life; necessity to operate under specific conditions; lack of information when on board a plane and during a jump; restricted time for implementation of necessary actions; movement in support-free space; expectation of dynamic shock at parachute opening and landing. They create a considerable load on the emotional sphere of paratroopers, which results in less successful performance or even professional activity failure (L. P. Grymak, 1971; D. D. Scherman, 1976; A. V. Barabanschikov, M. A. Belousov, V. V. Sysoev, 1982; B. V. Endal'cev, V. I. Kopanev, 1992; O. A. Blinov, 1998, 2007).

The traditional ways of building up readiness in the course of training and parajumping as of today are practically exhausted. Higher requirements to the quality of ground airborne preparation, technology of safe parajumping, as well as individual psychological characteristics of servicemen that later on are getting worse, necessitate new approaches to this problem solution (G. D. Temko, M. I. Tomchuk, 1996; G. A. Gaydukevich, G. V. Lozhkin, S. V. Semin, 1997).

Therefore a perspective direction of research is the study of building up emotional stability of paratroopers during airborne preparation based on their use of methods of autogenic training, which proved to be successful in sport psychology, medicine, military and aviation psychology (B. A. Vyatkin, 1981; A. P. Kozin, 1985; V. S. Lobzin, M. M. Reshetnikov, 1986; L. P. Grimak, 1991; V. M. Zvonnikov, A. V. Shakula, 1993), as well as in the activity of specialists of other categories who work under extreme conditions (M. S. Korol'chuk, 1996; P. P. Krivoruchko, 1998; O. A. Blinov, 2009).

The results of psychological research of features of building up emotional stability of 18-19 year-old servicemen, making their first parachute jump, have been used as the material for the work completion.

At all performance stages the features of paratroopers' emotional stability (totally 133 servicemen) were discovered by using a set of methods which included: subjective evaluation – by the "SAM"/(State-Activity-Mood) method (V. A. Doskin et al., 1973); evaluation of heart rate frequency (V. P. Zagryadskiy, Z. K. Sulimo-Samuylo, 1976); level of emotional stability, responsiveness and individual anxiety; the level of neuropsychic stability was found out with the help of questionnaires developed by H. Eysenck, Ch. Spilberg-Khanin, V. A. Bodrov and Lüsher's eight-colour test (V. L. Maryschuk et al., 1990); the building up experiment was conducted making use of special autogenic training methods (M. S. Korol'chuk, M. V. Kornienko, 1991).

For evaluation of paratroopers' emotional stability we employed direct indicators – individual evaluations that characterized successful preparation and execution of a parachute jump. The evaluation of servicemen professional operation success was made by direct indicators using the four-point scale in compliance with the requirements of the "Method guide on the organization and monitoring of airborne preparation".

The analysis of the results obtained showed that the use of autogenic training methods by paratroopers during airborne preparation had substantially influenced the success of the

experimental group servicemen performance.

The analysis of dynamics results of successful operation of emotionally stable servicemen of both control and experimental groups over inspection periods shows that the results of the experimental group servicemen are 12-16% higher than similar figures of the test group servicemen. The success of performance of emotionally unstable experimental group parachutists compared to the success of performance of the emotionally unstable test group parachutists is by 17-28% higher ($P<0.05$).

Parachute simulator training has proved that the success of performance of emotionally stable parachutists of the experimental group exceeds by 19% the figure for emotionally unstable parachutists, in parachute tower jumping – by 21%, and during execution of parachute jumps – by 30% ($P<0.05$).

To find out the dynamics of side indicators of emotional stability for the experimental group paratroopers, its features were studied under the conditions of airborne preparation. It was discovered that due to parachute simulator training completion as compared to the test group the level of how one feels is by 0.73 points higher, the activity level – by 0.42 points, mood – by 0.6 points, general evaluation of subjective state rises by 10% ($P<0.05$).

General evaluation of subjective state of the experimental group paratroopers on the take off area makes up 6.3 points, in flight on board an airplane – 5.94 points (exceeds the level of the test group by 6%), on the landing area after parachute jump completion – 6.95 points (exceeds the figure of the test group by 10%).

For the experimental group servicemen the highest heart rate frequency (HRF) over the research periods was discovered on the parachute tower top floor prior to jump execution and equals 118.33 bps (beats per second). It is 19% higher than the value of HRF during parachute simulator training and 14% higher than the HRF of paratroopers on board an airplane.

The comparative analysis of HRF levels for the servicemen of both test and experimental groups shows that for servicemen who utilized autogenic training, the HRF level during parachute simulator training is by 8% lower, during parachute tower jump execution – by 13%, and during parachute jumps execution – by 16%.

In the experimental group the level of situational anxiety revealed prior to jump execution from a parachute tower is equal to 42.15 points. Before commencement of parachute simulator training and parachute jumps execution it is 5-15% higher respectively, which we consider to be an adequate response to the use of autogenic training by paratroopers.

At the same time it was discovered that over the operating periods situational anxiety for the experimental group servicemen compared to the test group is 13-22% less, which testifies to the effectiveness of the measures proposed.

The analysis of indicators of individual anxiety of the experimental group paratroopers points to the emergence of its highest level prior to parachute tower jump execution and makes up 32.21 points. It exceeds the level of individual anxiety for parachutists before commencement of parachute simulator training by 4% and before commencement of parachute jumps execution – by 2%.

The level of individual anxiety revealed in the experimental group servicemen is 1-3% less than that of the test group, which testifies to its stability as a result of paratroopers performance.

Application of Lüscher's test results identified relevant levels of psychic tension, capacity for work, self-regulation. Thus, for the experimental group servicemen the dynamics of psychic tension is characterized by more obvious decrease of its level as compared to the test group. It becomes less upon termination of parachute simulator training and after a parachute tower jump respectively by 5% and 7%, and after execution of a parachute jump – by 10%.

In the experimental group all levels of operating capacity over the research periods are exceeding and differ ($P<0.05$) with regard to the relevant levels in the test group: before commencement of parachute simulator training by 43%, upon its completion – by 44%; before commencement of a parachute tower jump by 32%, upon jump execution – by 31%; on the take off area prior to parajumping by 36%, and on parajumping completion – by 43%.

It was discovered that all self-regulation levels of the experimental group servicemen as distinct from those of the test group at doing exercise on a parachute simulator, during parachute tower jumps, as well as during parachute jump execution have better indicators and undoubtedly differ ($P<0.05$) from the results of the test group. Thus, prior to parachute tower jumping in the experimental group self-regulation level makes up 2.43 points, that is by 66% more than the relevant value of self-regulation for the test group.

On the day of parachute jumps execution in the experimental group the self-regulation level of paratroopers on the take off area is 2.27 points, and it is 1.5 times higher than the relevant figure for the test group.

Based on the study of direct and side indicators of emotional stability of the experimental group paratroopers during preparation for and execution of parachute jumps a 10-14 day decrease of their preparation time for parachute jumps execution due to autogenic training application was found out.

Thus, a substantial improvement of results characterizing emotional stability of the experimental group paratroopers as compared to the test group in the periods of airborne preparation testifies to the positive effect of autogenic training.

In order to find out connection between performance success indicators of paratroopers and side indicators we have conducted a correlation analysis. An obvious connection ($P<0.05$) was found between the parameters of paratroopers successful performance during all periods of airborne preparation and their neuropsychic stability, the way they feel, activity, mood, situational and individual anxiety, heart rate frequency, as well as Lüscher's test results.

With the purpose of in-depth study of side and direct parameters connection of the experimental group servicemen performance the factor analysis was conducted making use of the principal component method (K. Pearson).

The factor analysis showed that the most informative indicators of determining the effectiveness of building up emotional stability based on the use of autogenic training by paratroopers appear to be neurotism and neuropsychic stability (0.91-0.92), situational (0.7) and individual anxiety (0.64), eight-colour Lüscher's test results - self-regulation (0.63), psychic tension (0.72), capacity for work (0.71), as well as HRF (0.52) and "SAM" (0.56).

Summary

1. Based on available literature data and professional experience, preparation for and execution of a parachute jump are connected with the effect of various stress factors on the human organism, the key ones being psychological: threat to life, necessity to operate in uncommon conditions of air space, permanent deficit of information when on board an airplane and during a jump, restricted time for implementation of necessary actions, expectation of dynamic shock at parachute jump execution and landing shock. If individual psychological features of servicemen are not taken into account in preparation for parajumping, it will result in a substantial decrease of emotional stability and giving up of further professional activity.

2. Building up of paratroopers' emotional stability is carried out on the basis of preliminary autogenic training which includes preparatory, relaxing-adjusting and active mobilizing periods, which allows to enhance emotional stability of paratroopers prior to and after parachute jump execution. Use of autogenic training by emotionally stable servicemen of the experimental group enabled to improve their performance during airborne preparation up to 16%. The most considerable changes were observed to occur with the emotionally unstable servicemen of the experimental group, who demonstrated an increase of performance by 17-28%. Application of autogenic training by paratroopers allows for 10-14 day reduction of their preparation time for parajumping.

3. For an early exposure and correction of paratroopers' low emotional stability during airborne preparation the following individual features and states are recommended to be studied: neurotism, neuron-psychic instability, individual and situational anxiety, subjective state, frequency of heart rate which by the correlation and factor analyses proved to be obviously connected with

emotional stability. Per se the level of emotional stability is determined by the methods developed by: H. Eysenck, Ch. Spilberg-Khanin, V. A. Bodrov, SAM, HRF, eight-colour Lüscher's test results, as well as paratroopers' performance success.

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L. Baranovska, Dr. Sc., Prof.
N. Glushanytsia, Lecturer
(National Aviation University, Ukraine)

METHODOLOGY OF FORMATION OF FOREIGN PROFESSIONALLY COMMUNICATIVE COMPETENCE OF FUTURE BACHELORS IN AVIONICS IN THE PROCESS OF THEIR PROFESSIONAL PREPARATION.

The paper examines and describes conceptual approaches to formation of foreign professionally-communicative competence of future bachelors in avionics.

Modern requirements of labour-market for professional preparation of aviation specialists are increasing depending on the rates of improvement of aerotechnics and complication of onboard electronic equipment. The level of formation of foreign professionally-communicative competence of future bachelor in avionics determines effectiveness of their future professional activity. So finding out conceptual approaches to form foreign professionally-communicative competence of future bachelor in avionics is getting actual nowadays. However this research is on its initial stage and it causes some contradictions between the society requirement in future aviation engineers with formed foreign professionally-communicative competence and conceptual bases for the decision of this task which are not developed properly.

In pedagogics of higher school there are some considerable works which involve various aspects of professional preparation of future specialists of aviation industry: Makarov R. M., Piven V.V., Kmita E.V., Tarnavska T.V., Zelenska L.M. However, they did not research important aspects of formation of foreign professionally-communicative competence for future bachelors in avionics.

The aim of the paper is to define some conceptual approaches to formation of foreign professionally-communicative competence of future bachelor in avionics.

Scientific researches in the field of pedagogics of higher school are carried out on the base of methodological principles of this problem. Home scientific schools interpret methodology as studies about the scientific method of cognition or as a system of scientific principles, which make the base of the research and help to choose cognitive facilities and methods. We agree with definition that methodology is conceptual exposition of aim, content, research methods which provide objective, accurate, systematized information about processes and phenomena.

Any scientific research causes critical thinking, analysis and clarification of the conceptual set, factors, pre-conditions and approaches for interpretation of the investigated material, in most sciences, particularly in pedagogics, scientific methodology is used. At the same time the peculiarities of certain science must take into account concrete scientific methodology. It is a complex of ideas or specific methods of certain science, which are the base for the decision of concrete research problem; scientific conceptions which are used by the researcher. Concrete scientific methodology is based on the universally recognized conceptions of leading scientists in the certain branch of science, and researchers' achievements which are generally accepted.

Success of scientific search is predetermined by scientist's ability to think conceptually. Scientific conception of research as a basis of concrete scientific methodology consists in clear determination of predictable leading scientific idea, essence of the phenomenon (object, subject of research), contradictions which appear in the process or phenomenon, stages, stages of development (or tendencies). It is formed on the basis of dialectical unity of such forms of scientific cognition as an idea, problem, hypothesis.

The notion "conception" in modern scientifically-pedagogical literature is interpreted in different ways. In our research we determine this concept as a main idea, qualificatory intention which orients at final result and based on the pedagogical terms and approaches.

Our scientific research will be based on such approaches as system, competence, personally-oriented, operational, culturological and communicative.

The strategic task of higher school is preparation of competent specialists who are able effectively decide typical and problem tasks in the process of their professional activity. The determination of studies technologies in higher educational establishments which realize competence approach are getting more and more important. Competence studies is oriented to obtain knowledge, abilities, skills, and experience of practical activity in order to prepare future bachelors in avionics (who are the object of our scientific interest) with professional and socially meaningful competence. Thus, pedagogical technologies must teach the future specialists of aviation industry experience of professional activity.

The analysis of pedagogical sources testifies that in pedagogics there is not generally accepted category about "pedagogical technologies" and their derivatives because scientists determine the structure and components of educational process in different ways. Modern researchers examine pedagogical technology as a system method (S. Goncharenko, I. Prokopenko, V. Evdokimov), didactics system (O.Savchenko, D.Chernilevsky), activity (V.Slastonin), order, logic, sequence (M.Klarin), constructing, planning of educational process(I. Bogdanova, V. Voronov, V. Palamarchyk), structured planning(V. Bespalko, I. Pidlasuy), active scenario of organization of studies(I. Smolyk). There are over 300 definitions of this concept. However, common in interpretation of term "pedagogical technology" is orientation of pedagogical technology at the increase of efficiency of educational process and achievement of certain results of studies [1].

We suggest to consider the notion "pedagogical technology" as a system of facilities, methods and receptions of the educational process oriented at successful realization of certain pedagogical goal.

The results of analysis of theoretical sources allowed us to define the integral functional structure of pedagogical technology as combination of such components as: conceptual basis, content part with the special purpose program; judicial block; motivational constituent; diagnostic part [2].

On the basis of this structure of pedagogical technology we determine the following structural components of pedagogical technology of forming foreign professionally-communicative competence of future bachelors in avionics: objectives of formation foreign professionally-communicative competence; facilities of its formation; facilities of pedagogical cooperation of teacher and student; stage-by-stage process of formation of foreign professionally-communicative competence: the motivational stage (an aim - creation of the motivational system to motive students to form foreign professionally-communicative competence); planning stage (development of the individual special purpose program of formation of foreign professionally-communicative competence); organizational stage (formation of skills of productive self-organization); stage of control, analysis and adjusting; result (formed foreign professionally-communicative competence). We consider that communication between subjects unites the mentioned stages in the system.

To our opinion, it will be the most expedient to apply in the educational process of formation of foreign professionally-communicative competence of future bachelors in avionics of following technologies of studies : problem, project, interactive.

The essence of problem technologies of studies is that students solve problem situations regularly. The advantage of this type of studies is that it is connected with the commonunication which is one of the effective forms of activity. Practice testifies about expedience of combination of problem studies with other methodical approaches.

Usage of problem technologies during preparation of future specialists of aviation industry assists to development of professional qualities, formation of skills and difficult professional abilities. As for possibilities to use problem studies while teaching professional English by future bachelors in avionics, the basic fundamental knowledge (grammar, vocabulary) must be reported to the students and explained them. Considerable part of methods of actions must also be shown and trained by doing exercises. Therefore we suggest combining problem studies with a reproductive type. The expediency to use problem-dialogic studies during preparation of future specialists of aviation industry is that the amount of the known knowledge exceeds the volume of the new one.

The contents of problem technology studies contains methods, organizational forms and

facilities of the expedient usage of educational problem situations, setting and solving educational problems, methods of producing problem tasks by the teacher, acceptance and solution of problem tasks by the students.

The main elements of problem studies are "problem situation" and "educational problem". S. Rubinstein [3] claims that problem situation creates such conditions when a person has to make choice and decision. Scientist says that problem situation is the thinking beginning, induces personality to the active thinking. This quality is necessary for the future specialists of aviation industry, namely for engineers.

It is possible to consider the method of projects as the development of problem method, which is based on any problem, methods of research search and its decision, independent students' activity. Unlike problem studies, in the project studies of formulation of educational problem, its analysis and decision is made by the students independently. The result of their mutual activity must be the real product, a project. Interactive studies are of special interest, they are realized in application of role plays, studies and discussion, where student and teacher are the subjects of educational process with equal terms. Interactive technology means studies in collaboration, forms ability to think eccentrically, to see a problem situation in its own way and find the way out of it.

Having analysed these technologies of studies, we can make conclusion, that all of them are the constituents of technology of context studies the essence of which consists in planning of educational process in higher educational establishments maximally close to future professional activity.

Modern methodology is presented by system approach. It means that all the elements of the examined phenomenon are interconnected and interdependent. System approach can be methodological for organization of professional preparation process, because it helps to model the process of formation of foreign professionally-communicative competence of future aviation specialists.

Scientific researches of system approach and system analysis, done by P.K. Anokhin, I.V. Blauberg, E.G. Yudin, N.V. Sadovskiy, A.I. Uyomov help us scientifically prove and explain the model of formation of foreign professionally-communicative competence of future bachelors in avionics on the basis of study of maintenance manual and analysis of aviation incidents for technical malfunctions. They also enable: to do this research on the base of system approach; to develop and systematize didactic-communicative filling of model of formation of foreign professionally-communicative competence of future aviation specialists.

For this reason we suggest using system approach as one of the main ones to form foreign professionally-communicative competence of future aviation specialists in the process of their professional preparation. In our research the peculiarity of system approach is that it orients the research to show the integrity of the object (foreign professionally-communicative competence of future bachelors in avionics in the aviation technical higher educational establishment) and mechanisms (formation of foreign professionally-communicative competence of future bachelors in avionics in the aviation technical higher educational establishment), in order to find out various types of connections of complicated object and connect them in the unique theoretical system.

Operational approach, which is based on acceptance of activity as a basis, mean and determining condition of personality development, is very important to achieve the effectiveness of formation of foreign professionally-communicative competence. In professional pedagogic this approach means interconnection between the contest of trade education and professional labour activity. Application of activity theory in the process of training of future engineers of aviation industry will enable maximally close the process of studies to their real professional activity.

Knowledge, abilities, skills, obtained by the students, must be reasonably used in their future practical activity. The task of the teacher is to teach future specialists to work and do some actions and operations which help to realize activity. A student must be master of practical action.

Having taken into account mentioned above ideas of operational approach, we decided to consider Maintenance Manual as the base educational material, because bachelors in avionics will directly work with it in their future professional activity. The primary practical objective of our

research is to provide flight safety, so we also suggest analyzing materials of investigation of aviation incidents for technical faults. It will help to develop analytical thought and motivation to studies. Studying Maintenance Manual will allow students to realize complication of their future professional activity and responsibility for crew members' and passengers' lives. These materials must be used for development of problem tasks, business and role games.

A modern tendency in trade education is a necessity of synthesis of operational and personality approach, because personality is the subject of activity.

Personality approach, to our opinion, provides formation of future specialists of aviation industry as harmoniously developed creative personalities, ready for self-development and self-perfection.

Successful realization of future professional activity of aviation specialists is impossible without knowledge of foreign language, which is becoming the major mean of professional communication of specialists of different spheres, a study of which is impossible without the use of communicative approach which means mastering both the rules of operation by foreign models and communicative-speaking function. Communicative approach in an educational process of learning foreign language is realized due to realization of foreign speaking activity by the future aviation engineers. In accordance with communicative approach, a process of studying of foreign language must be the model of communication process.

Professional activity of future bachelors in avionics involves flights to different countries, and that is why we will also use culturological approach. It includes knowledge about culture, history, realities and traditions of different countries; linguistic phenomena.

Conclusions

Having taken into account mentioned above ideas, we can claim that combination of professional knowledge with foreign language knowledge can become the important condition of formation of interculture of future aviation engineers. To realize the task of formation of foreign professionally-communicative competence of future bachelors in avionics, we suggest using various approaches with the purpose of optimization of educational process, and to emphasize communicative approach which provides effective practical application of intercourse (phonetic, lexical, grammatical) facilities in the process of realization of foreign professional intercourse.

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Professor G.V. Kovalenko, Doctor of Engineering Sciences
(St. Petersburg State University of Civil Aviation, Russia)
V.E. Kalenov (St. Petersburg State University of Civil Aviation, Russia)

EXPERIMENTAL VERIFICATION OF METHOD FOR HELICOPTER PILOTING INTENSITY DETERMINATION IN HOVER-FLIGHT CONDITION

The article presents results of the experiment carried out to verify new method for helicopter piloting intensity determination, experimental diagrams of helicopter piloting intensity in hover-flight condition. It also approaches issues concerning application of these diagrams.

Until quite recently it was accepted to equate conditionally helicopter piloting intensity to aircraft piloting intensity; however in reality differences are significant, especially in hover-flight condition. Based on flight experience and analysis of literature [4, 5, 8] it is easy to assume that the helicopter hover balance is performed through three channels. When hovering the helicopter pilot needs to trim it in roll, pitch, direction and height. Hover balance differs significantly from level flight trim. Roll and pitch trim is performed with control stick of main rotor (MR) cyclic pitch, height balance is performed with collective control stick of main rotor, direction balance is performed only with pedals. While studying the helicopter piloting intensity in hover-flight condition due to the fact that balance with cyclic control stick is performed simultaneously in respect of roll and pitch and largely through "diagonal" movements it will be one control channel and let us call it "longitudinal-lateral" one. So we have three channels of control:

- longitudinal-lateral channel (movement of MR cyclic control stick);
- height channel (movement of MR collective control stick);
- direction channel (movement of pedals, tail rotor control (TR)).

Helicopter piloting intensity in hover-flight condition is equal to the sum of intensity for actions performed through three channels of control.

In 2010, experimental operation of the Ansat-U helicopter [9], on which the ZBN-ANSAT flight data recording system is installed, was started.

ZBN-ANSAT flight data recorder is designed for collecting, recording and storage of flight information that makes it possible to assess objectively piloting technique of flying personnel, to monitor status of propulsion package and airborne systems, as well as to determine the cause of flight accident or near accident.

Considering parameters that characterize helicopter movement and position of control devices we can calculate piloting intensity, flight parameter accuracy and rate of controlled flight parameter change and on the basis of studies make diagrams of the helicopter piloting intensity at different phases of flight.

The purpose of the experiment is to develop a method for the helicopter piloting intensity determination in hover-flight condition, make diagrams of hover piloting intensity according to experimental data.

Eight pilots with different level of training and flight experience (300-2,000 flight hours), as well as proficiency (from pilots without class to class 1 pilots) have participated in the experiments. 50 experimental flights have been conducted. They involved performance of hovering at various altitudes, under different weather conditions with subsequent analysis of flight parameters and pilot actions.

To calculate hover piloting intensity we shall take materials of ZBN flight parameter recording, represent flight parameters that are of interest to us, divide into time segments equal to one minute, figure 1. We consider calculation methods through the example of an experiment No. 24.

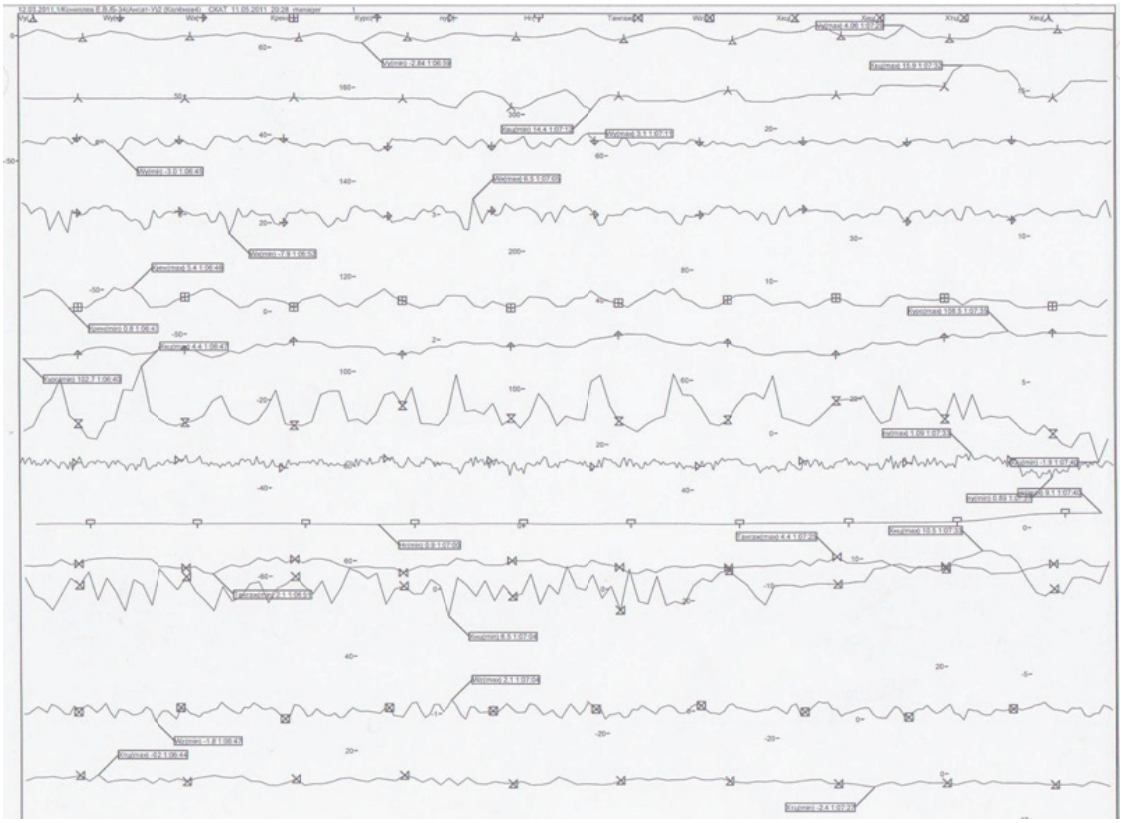

Figure 1. Materials of ZBN flight parameter recording

Longitudinal-lateral channel control motions are rolling and pitching motions of cyclic control stick. In this diagram rolling motions of the control sticks are denoted as Xr_{cyc} and pitching motions are denoted as Xp_{cyc}.

Having counted a number of motions through these channels we obtained that a number of rolling control motions – $Xr_{cyc} = 41$; a number of pitching control motions – $Xp_{cyc} = 22$. Due to the fact that balance with cyclic pitch control stick is performed simultaneously in respect of roll and pitch and largely through "diagonal" movements a number of rolling motions in this experiment is bigger, so we determine the intensity of longitudinal-lateral channel by dividing a number of rolling control motions by length of segment in seconds:

$$J_{n\ longitudinal\text{-}lateral} = Xr_{cyc} / Ts = 41 / 60 = 0.68\ OE/s$$

Thus we have obtained actual piloting intensity of longitudinal-lateral channel in this experiment.

Let us determine on what piloting intensity depends: parameter δ is nothing but accuracy of controlled parameter hold by a pilot and in this case it is a roll. At the studied segment maximum value of roll (γ) is equal to 5.4˚, minimum value of roll (γ) is equal to 0.8˚ (figure 1). Accuracy of roll holding will be equal to:

$$\delta = (\gamma max + \gamma min) / 2; \qquad \delta = (5.4^\circ + 0.8^\circ) / 2 = 2.3^\circ$$

In this case a rate of controlled flight parameters change – δv is an average of roll rate. In figure 1 it is denoted as Wx. In this flight segment maximum roll rate is equal to 6.5˚/s, minimum roll rate is equal to 7.9˚/s *(negative value, left roll)*.

$$\delta v = (Wx max + Wx min) / 2; \qquad \delta v = (6.5^\circ/s + (-7.9)^\circ/s) /2 = 7.2^\circ/s$$

Let us determine $\sqrt{\delta} / \delta v$:

$$\sqrt{\delta} / \delta v = \sqrt{2.3^\circ} / 7.2^\circ/s = 0.21\ s.$$

All other calculations in the experiments are performed similarly. Obtained data are summarized in the table, fragment of which is given below.

Table 1

№п/п	*Jкрен ОЕкц*	*Jтангаж ОЕтц*	*Jпрод-боков ОЕ/с*	*√δ/δв*
1	*0,45*	*0,12*	*0,45*	*0,41*
2	*0,38*	*0,13*	*0,38*	*0,51*
3	*0,38*	*0,17*	*0,38*	*1,02*
4	*0,62*	*0,45*	*0,62*	*0,16*
5	*0,7*	*0,6*	*0,7*	*0,32*
……	……	……	……	……
23	*0,55*	*0,37*	*0,55*	*0,29*
24	*0,68*	*0,37*	*0,68*	*0,21*
25	*0,5*	*0,38*	*0,5*	*0,23*
……	……	……	……	……
48	*0,52*	*0,33*	*0,52*	*0,29*
49	*0,45*	*0,37*	*0,45*	*0,25*
50	*0,35*	*0,35*	*0,35*	*0,38*

We have made a diagram on the basis of this table and having approximated data we have obtained a diagram of longitudinal-lateral helicopter piloting intensity in hover-flight condition, as well as its equation, which can be used for calculations, figure 2.

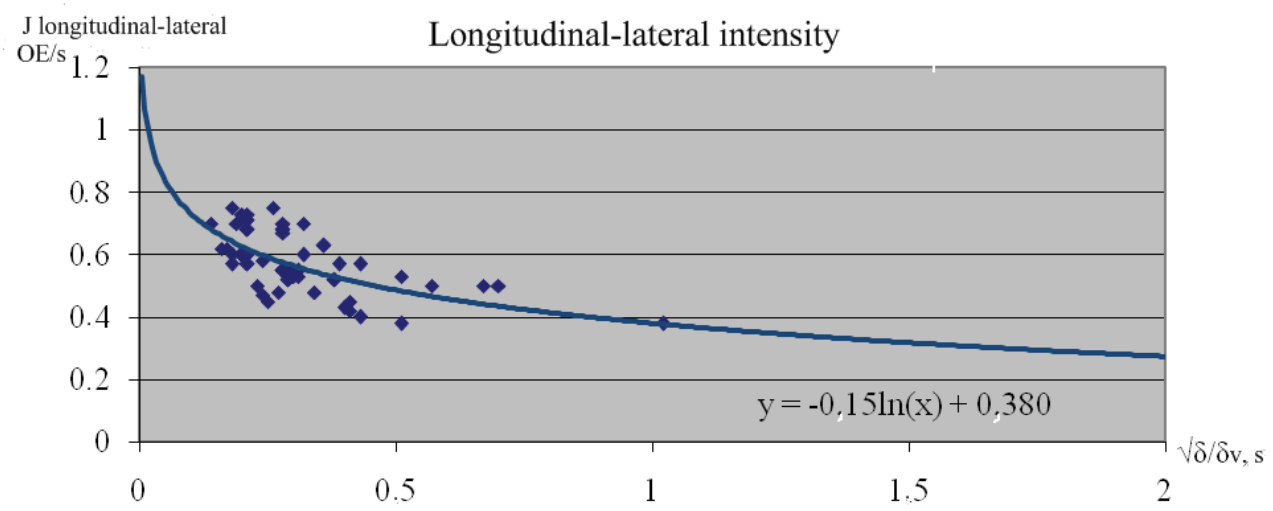

Figure 2. The experimental diagram of longitudinal-lateral helicopter piloting intensity in hover-flight condition

Similarly a table was compiled and a diagram for height (movement of MR collective control stick) and direction channel (movement of pedals, TR control) was plotted, figures 3 and 4.

The resulting experimental diagram of the helicopter piloting intensity in hover-flight condition is shown in figures 5.

Total helicopter piloting intensity in hover-flight condition will be a sum of three channels intensity:

$$Jp. = Jp.\ longitudinal\text{-}lateral + Jp.\ of\ height + Jp.\ of\ direction$$

According to the results of experiments average helicopter piloting intensity in hover-flight condition is equal to 1.34 OE/s. This value does not exceed permissible (*Jpermissible = 1.66 OE/s)* and threshold (*Jthreshold = 2 OE/s)* values. But there is very small reserve for operational workload concerning performance of sensory, sensomotor and some motor operations to these values.

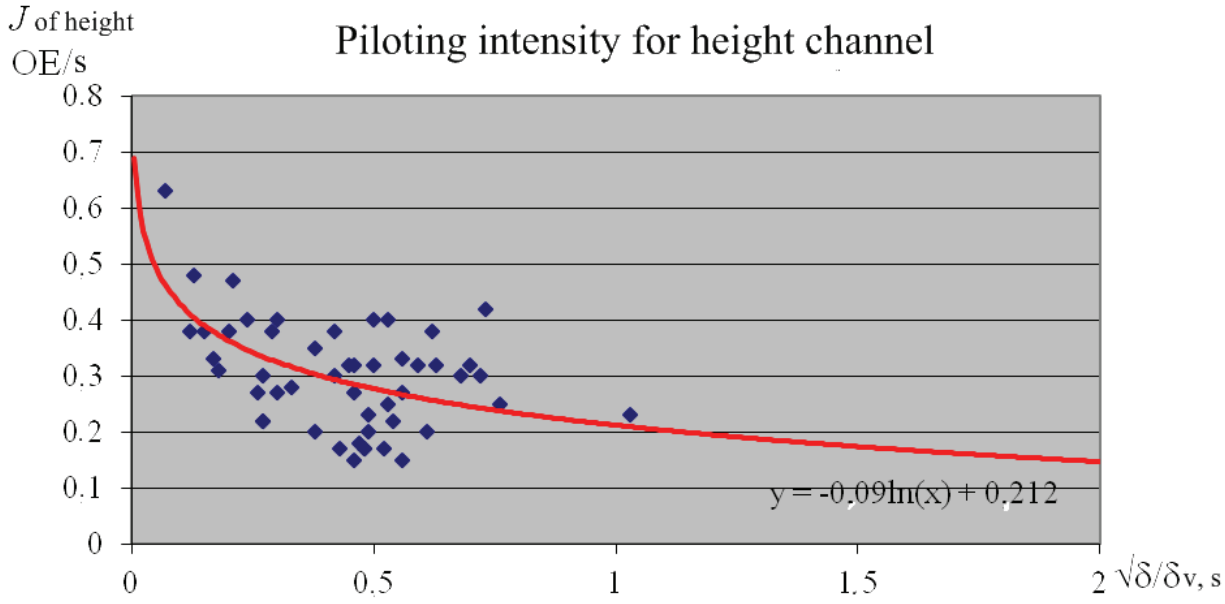

Figure 3. Experimental diagram of helicopter piloting intensity in hover-flight condition for height channel

When operating continuously with intensity equal to or above its threshold value, a number of errors increases up to 50% during performance of a given algorithm.

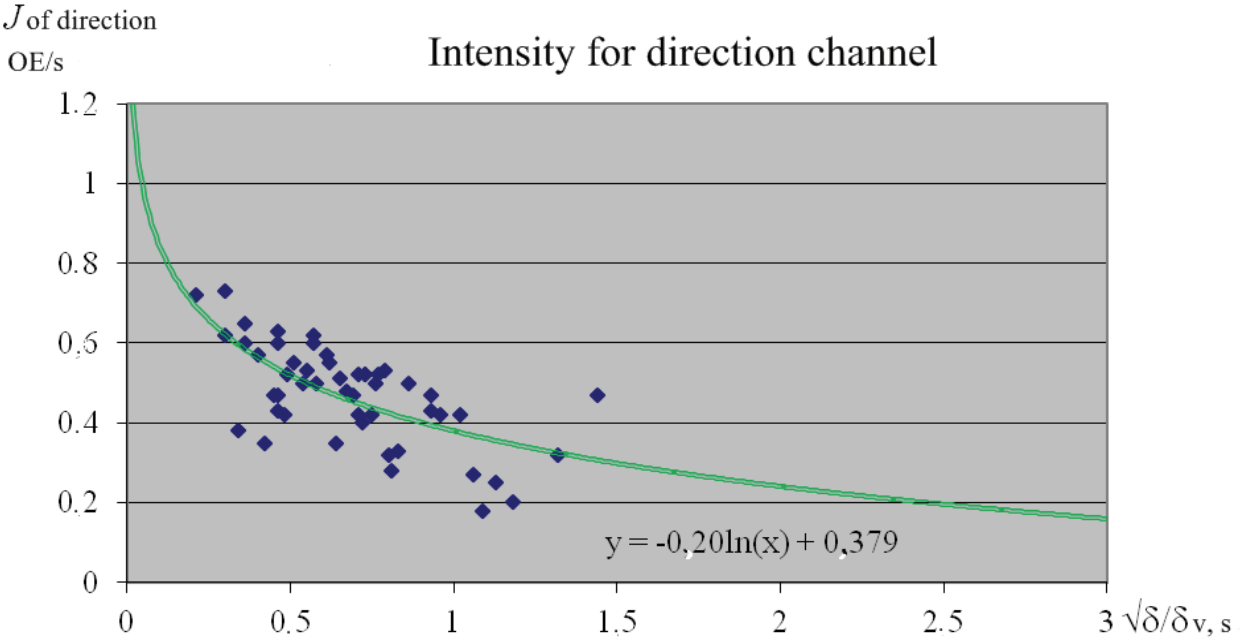

Figure 4. Experimental diagram of helicopter piloting intensity in hover-flight condition for direction channel

As shown by experimental data in the course of flight operation an average intensity of crew member actions, at which a number of errors does not exceed 5%, is equal to 1.66 OE/s (*Jpermissible*) [1-3, 7].

The above considered method makes it possible to solve a problem of reducing a helicopter pilot operational workload by changing crew work technique in hover-flight condition, as well as to predict of flight parameters keeping error at a limited reserve of intensity.

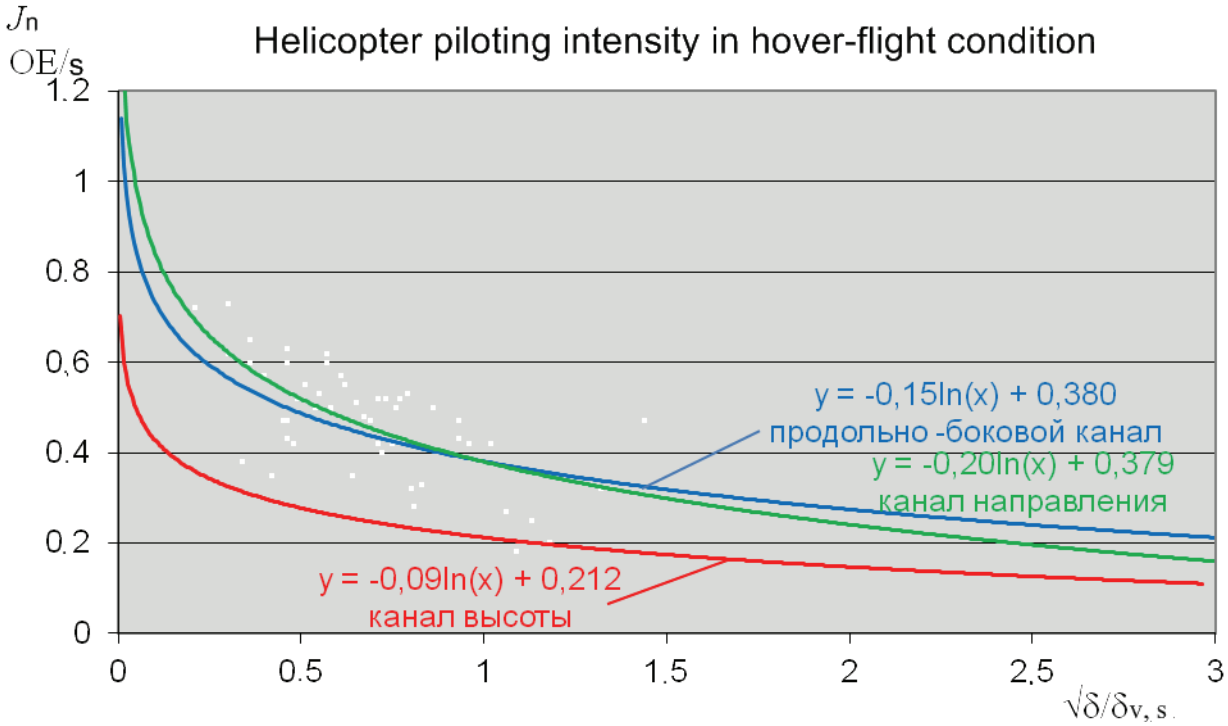

Figure 5. Experimental diagram of helicopter piloting intensity in hover-flight condition

канал высоты	height channel
продольно-боковой канал	longitudinal-lateral channel
канал направления	direction channel

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Professor G.V. Kovalenko, Doctor of Engineering Sciences
(St. Petersburg State University of Civil Aviation, Russia)
M.V. Barabanov (St. Petersburg State University of Civil Aviation, Russia)

MATHEMATICAL MODEL OF THE TRAINING METHOD ORIENTATION PILOT

The article offers spatial orientation pilot training method using "inside in" kind of horizon indicator and mathematical model for this training process method.

The process of spatial orientation percept formation is the complex element of pilot training. Its formation demands purposeful preparation, method of which is not fully developed up to the present day [1-4].

Many theoretical researches [2-4] claim that the most accurate kind of horizon indicator (HI) to use is "outside out" HI. However, practically every civil aircraft (CA) has "inside in" kind of HI installed nowadays. It could lead to spatial disorientation in dangerous situation [3, 5]. Contradictions, having two methods of spatial disorientation problem solution during the flight, emerge. The first method is to use more advanced indicator that provides the pilot with information about CA position with reference to ground plane. The second one is to design and implement new spatial orientation pilot training methods in nominal mission, abnormal case including situations beyond limitations of CA.

This article demonstrates mathematical training model developed according to the new method of pilot skill formation in spatial orientation using "inside in" kind of HI. This training method is aimed at minimization of action errors during piloting.

Depending on the literature and personal experience analyses, the authors made an assumption that visualization, whereby displayed on the simulator monitor CA is movable, dimensional and its empennage is turned to the side of operator while the "earth" is immovable (see figure 1), it could increase the CA piloting skills stability for "inside in" kind of HI in dangerous situations. The new training method has the following steps: at the beginning, the piloting is exercised on the simulator only with the CA display on the monitor, then with the CA display and reading of "inside in" kind of HI simultaneously (see figure 3) The authors assume that this method should be helpful in forming such a visualization flight of pilots that would provide more stable spatial orientation skills during the flight. To verify this hypothesis, a special program for experimental group based on the use of "inside in" kind of HI was created.

Developed program included five exercises and was carried out on procedural simulators in St. Petersburg State University of Civil Aviation:

the first exercise: CA displayed on the simulator's monitor is movable, dimensional and its empennage is turned to the side of operator, the "earth" is immovable; one flight lasts ten minutes (figure 1);

the second exercise: CA control (display is similar to that in the first exercise) is in vertical plane, i.e. performing flying maneuvers: spin, rolling, loop maneuver; one flight lasts fifteen minutes;

the third exercise: regime control members (altitude and speed) are added additionally to the aircraft display (see figure 2); one flight lasts fifteen minutes;

the fourth exercise: horizon indicator responses together with the aircraft display, altitude display and speed indicator are added (see figure 3); three flights, each of fifteen minutes;

the fifth exercise: "piloting" is performed with the help of navigation instruments, CA control panel is displayed only, the aircraft display is not available; five flights, each of fifteen minutes.

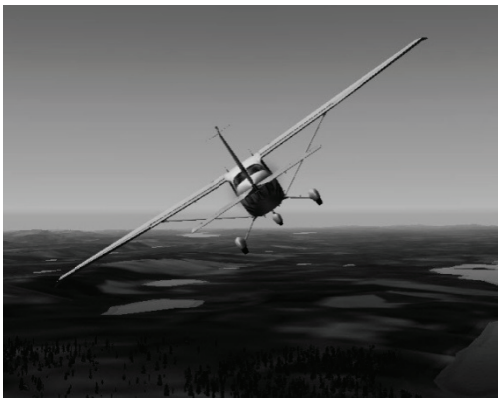

Figure 1

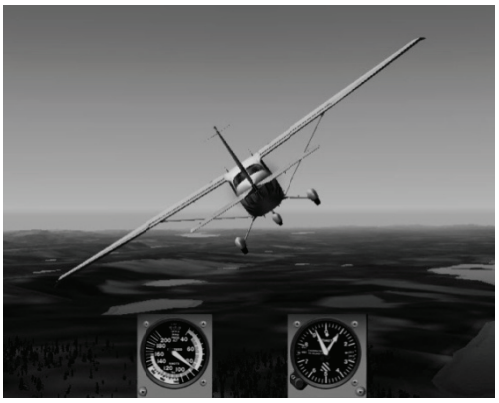

Figure 2

Operating at the present days, training program using procedural simulators includes ground training, familiarization flight to the landing zone and cruising flights using navigation aids. Total training time is 27 hours. Training program offered by the authors lasts 2 hours and 40 minutes and is meant not as substitution of existing program, but as addition thereto.

Figure 3

In virtue of exercising time and volume of presented information, mathematical model of information accumulation in memory while presenting information with interruptions in the terminology offered in [6,7] was provided. Mathematical model was used to define the ideal time to present information.

Level value of information occurring in the pilot's memory after each exercise was determined.

Formula describing the process of acquiring information in the first exercise is as follows:

To define the amount of information I at first general amount of incoming information was calculated [8]:

where m is a number of presented instruments;
l is effective length of instrument scale (in degrees);
Δl is an error while reading the instrument (in degrees).

Speed of presenting information was calculated by the following formula:

$$R = \frac{I_{\Sigma}}{\tau}$$

where τ is a time of presenting information (in seconds).

Here τ means exercising time (10 min.).

$$R_1 = \frac{3{,}17}{600} = 0{,}005$$

Calculating the time constant of information acquiring:

where a = 2.6 [7]:

$$T_1 = \frac{2{,}6}{0{,}005^{1{,}1}} = 831{,}35$$

Calculating the correlation between time of presenting information and time constant:

$$\bar{\tau} = \frac{\tau}{T}$$

$$\overline{\tau_1} = \frac{600}{831{,}35} = 0{,}722$$

Information amount after the first exercise is the following:

$$\overline{I_1} = \frac{(1 - e^{-0{,}722})}{0{,}722} = 0{,}712$$

Obtained value of information acquiring process indicates that the selection of exercising time and amount of presented information were right and it is conformed to many experiments [7]. If to reduce the volume of presented information, the activity of an operator is decreased. Considerable increase in the volume of presented information results in an operator overloading. Both changes of information volume negatively influence the operator's information perception.

Now calculate forgetting of acquired information after the first exercise.

To do it, we define I_{∞} value at first (the information amount in the memory upon the expiry of time period) [8]:

$$\overline{I_{\infty}} = \frac{(\bar{I} - e^{-\bar{\tau}})}{1 - e^{-\bar{\tau}}}$$

For the first exercise I_{∞} equals:

$$\overline{I_{\infty 1}} = \frac{(0{,}712 - e^{-0{,}722})}{1 - e^{-0{,}722}} = 0{,}44$$

Speed of forgetting information is calculated by the following formula:

$$R^* = \frac{(\bar{I} - \overline{I_{\infty}})}{T},$$

where τ^* is the time of forgetting information, i.e. from the end of exercise to the beginning of the next one (in seconds).

$$R_1^* = \frac{(0{,}7123 - 0{,}4404)}{831{,}3537} = 0{,}0003$$

Calculating the time constant of forgetting information:

$$T^* = \frac{a}{R^{*\,1{,}1}}$$

$$T_1^* = \frac{2{,}6}{0{,}0003^{\,1{,}1}} = 17734{,}93$$

Calculating the correlation between time of forgetting information and time constant in the process of forgetting information:

$$\overline{\tau^*} = \frac{\tau^*}{T^*}$$

$$\overline{\tau_1^*} = \frac{300}{17734{,}93} = 0{,}017$$

The information amount remaining in the memory after the τ^* lapse after finishing the exercise is described as follows:

$$\overline{I_n^*} = \overline{I_{\infty n}} + \left(\overline{I_n} - \overline{I_{\infty n}}\right)e^{-\overline{\tau_n^*}}$$

The information amount remaining in the memory after some time of the first exercise:

$$\overline{I_1^*} = 0{,}44 + (0{,}712 - 0{,}44)e^{-0{,}017} = 0{,}708$$

Calculation of information acquiring process for the following exercises was performed by the formula:

$$\overline{I_n} = \left(\frac{1 - e^{-\overline{\tau_n}}}{\overline{\tau_n}}\right) + \left(1 - \frac{1 - e^{-\overline{\tau_n}}}{\overline{\tau_n}}\right) * \overline{I_{n-1}^*}$$

Numerical expression for the following exercises is equivalent to the expressions in the first one.

The process of information accumulation in the memory during training according to the offered method is presented on the figure 4.

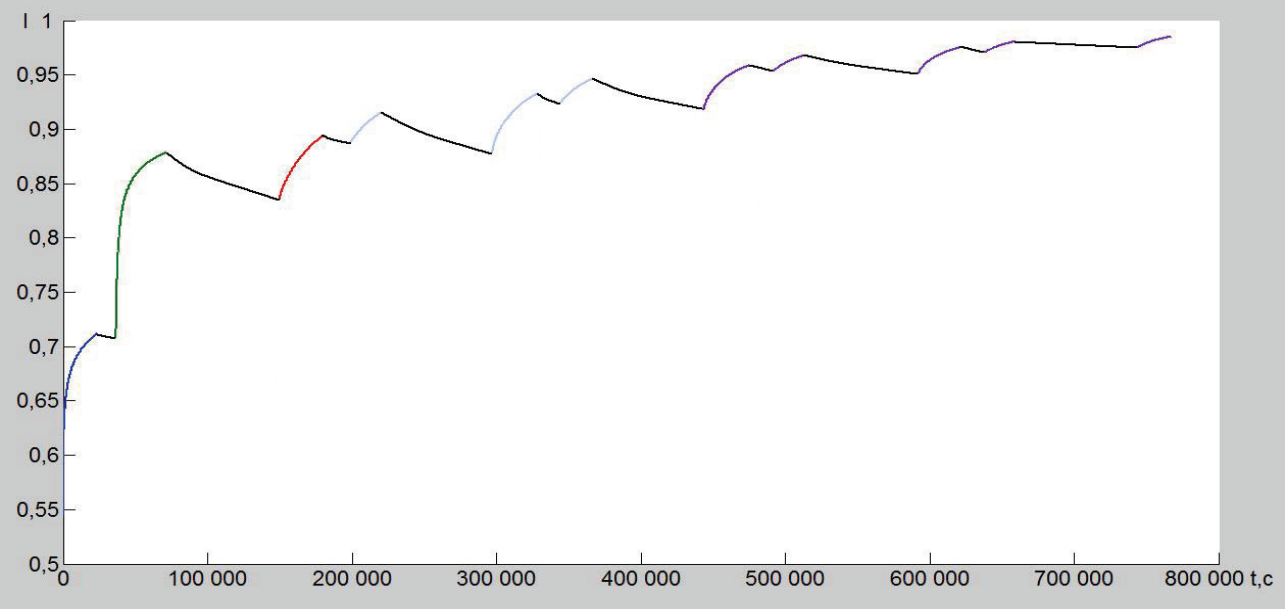

Figure 4. The process of information accumulation

Moreover, the testing model was developed (in the manner of experimental group model). It included exercising time and break time between exercises. Results of this model allow making conclusions that two variants of appropriate training program are existing. The first variant: exercising time is 20 minutes with 5-minute breaks. The second variant: pair exercises with 24-hour break (between couple of exercises) and 5-minute break between exercises at the same day.

Conclusions: mathematical modeling use gave the opportunity to define the appropriate exercising time for exercises and breaks between them. Total time for spatial orientation maintenance training program was three hours and forty minutes. The fact that numerical characteristics of developed models coincide with many experiments [6] proves their validity. Final value of the information amount in developed models is well matched with the experiment results [1], carried out in the Department of Flight Exploitation and Professional Training of Aviation Personnel in St. Petersburg State University of Civil Aviation. Experiment result processing proves statistically positive validity of the offered spatial orientation pilot training method.

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V. Gorbunov, Dr. Sc., Prof.
(National Aviation University, Ukraine)

«ONLY TWO PILOTS» – ERGONOMIC FACTORS OF FLIGHT DANGER

"Technocratic" algorithm of performance of the interrupted take-off by the crew consisting only of two pilots, has been estimated with the help of information technology "BPwin". Ergonomic factors of flight danger in such situation were revealed and that has allowed to develop the "ergonomic" algorithm eliminating them and providing higher level of safety of interrupted take-off from the position of human factor.

1. Introduction

Procedural operating conditions of the pilot are that ergonomic factor which, appreciably, determines efficiency of his professional actions to prevent flight incident [1]. In this connection, the shortages of algorithms of performance of functional duties can become the ergonomic reasons of flight danger, especially in the case when the crew consists of two pilots only (the **Cap**tain, - **CAP** and the **Cop**ilot, - **COP**). Such pilots, besides traditional duties on piloting the plane, periodically have to carry out duties of other members of "traditional crew", the navigator, the flight engineer, flight radio operator. And though carrying out of these additional duties is provided with the specialized automatic complexes, pilots nevertheless are obliged without fail to distract from piloting, the control and secure each other, to carry out "not pilot's" tasks.

In such "industrial" conditions, the crew consisting of two pilots only, represents higher potential danger, as a source of the professional mistakes caused by a working overload, lack of time, psychophysiological tension, etc. One of the ways to increase the professional reliability of pilots is ergonomic optimization of their working algorithms, first of all, for refusal flight situations.

2. Information technology Business Process Modeling (BPwin) as an analytical tool of ergonomic estimation of working algorithms

Proceeding from these circumstances, for revealing the ergonomic reasons of flight danger of two member crew of the new airliner, we have carried out preliminary analytical estimation of opportunities of two pilots to carry out the interrupted take-off, because of refusal of one engine, safety, performing it according to the "technocratic" algorithm submitted in the project **F**light **M**anual (**FM**) of plane.

Ergonomic shortage of such algorithm was that it did not take into account time psychophysiological opportunities of the pilot as a human - operator [2], and was based, only, on the aerodynamic calculations made according to the standard normative engineering specifications [3, 4].

Negative role of these shortages in providing time requirements to the interruption of take-off because of refusal of the engine at the moment of achievement the speed of decision-making (V_1), has been estimated with the help of information technology "**BPwin**" [5].

3. Procedural factors of flight danger of "technocratic algorithm"

Within this technology, having applied techniques **A**ctivity **B**ased **C**osting ("**ABC**") and **U**ser **D**efined **P**roperties ("**UDP**") [6], we have revealed the absence of some necessary reports, commands and working operations, wrong names of functional elements of plane systems, and also not optimum sequence and duration of working algorithm for the organization of interrupted take-off.

According to ”ABC” technique, theoretically calculated general "psychophysiological" duration of realization by two-member-crew the technocratic algorithm of interrupted take-off, with the account of durations of carrying out elementary working operations [2], has been 49.11 second (100%), of which **CAP** has been working with the corresponding plane equipment to stop the plane - 17.28 second (35%), and **COP** - 31.84 second (65%).

And "UDP" analysis has revealed significant amount of negotiations between members of the

crew, a plenty of ergonomically inexpedient operations, ordered to both pilots, especially, to the **CAP**, the absence of time opportunities to carry out the mutual control and secure each other at presence of high probability of mistakes because of confusing the used information, especially in **COP**'s work (table 1).

In the normative document on certification of planes [7] basic requirements to **FM** as to the document regulating the order of actions of the crew, are submitted in items 2.2.7.1 and 2.3.4 according to which instructions of **FM** on actions in difficult situations, do not have to demand from the crew excessive efforts and unusual methods of piloting and should be stated precisely, briefly and unequivocally.

Table 1.

Comparison of procedural characteristics of different variants of algorithm of work of two-member-crew at the interrupted take-off because of the refusal of one engine

Quantity of working operations with the different procedural characteristics, carried out by members of crew (according to "UDP") for different variants of algorithm				
Procedural characteristics of working operations	**Technocratic algorithm**		**Ergonomic algorithm**	
	Captain	**Copilot**	**Captain**	**Copilot**
Elementary operations:	∑23	∑35	∑4	∑36
Intellectual	6	8	2	8
Physical	5	9	0	13
Visual	4	7	0	6
Acoustical	3	4	1	4
Speech	5	7	1	5
Inexpediency	17	8	0	0
Absence of secure	23	34	4	34
Opportunity of confusing	7	19	0	2

Revealed with the help of information technology "BPwin" procedural shortages of technocratic algorithm, testify that project **FM**, regarding performance of the interrupted take-off, does not correspond to requirements of these items to the full and demands adequate changes.

As sufficiency of time is restrictive criterion of performance of working algorithm for definition the biggest possible "safe" duration of the interruption of take-off, the most unfavorable operational conditions have been considered: the minimum take-off weight, the maximum temperature of external air, a fair wind (at corresponding wing flaps and speed of decision-making [8]) which promoted the biggest duration of run. And for these conditions, on the basis of aerodynamic calculations with the help of graphs of **FM** [9], we have determined, that, at full braking (a reverser + brakes) for a full stop of the plane on **R**un**W**ay (**RW**) is required 28.40 second. On the basis of this "aerodynamic" duration of run has been calculated "the distance of the interrupted take-off" for the considered airliner.

At the same time, calculated "psychophysiological" duration of realization by two pilots of all ordered by **FM** working procedures [2], according to technocratic algorithm, has been 49.11 second. This time is 1.73 times as big as the time used for calculation of "the distance of the interrupted take-off" (28.4 second). The revealed discrepancy, apparently, can be explained by the fact that calculations were based on "declarative" data from the normative documents [3, 4, 7], about time which is given crew for performance only some of the working operations necessary to stop the take-off without taking into account full quantity of them and "psychophysiological" peculiarities of the performance [2]. This time did not take into account durations of carrying out each of them, and these durations were appointed within 1-2 seconds to perform a separate action, taking into consideration the interval between them [3, 4], "not to exceed" necessary length of **RW** [9]. Such declarative approach to the estimation of duration of working process, does not correspond to modern experimental data of engineering psychology about duration of performance by the human-operator of separate physical and mental working operations [2] and consequently is

ergonomically irrational.

The fact, that duration of all algorithm of the interrupted take-off, calculated with the account of "psychophysiological" durations of performance by pilots of separate working operations [2], has essentially exceeded one, that has been determined on the basis of normative documents [3, 4], testifies about the necessity of much longer length of **RW** for guaranteeing the safe stop of take-off . Besides during interrupted take-off **CAP** during 35%, and **COP** - 65% of time are obliged to carry out only "refusal prevention" functional duties working with plane systems that does not allow both of them "to distract" on providing safety of run. As a result the pilots, in these time intervals, directly do not participate in active management by the direction of movement of the plane on **RW** and have no time opportunities effectively to supervise, help and secure each other.

According to item 2.2.10. [7], during performance of any flight task "…the personnel of the crew of the plane (all members of crew and their professional staff) have to provide performance of all operations, ordered by **FM**, during "available" time at each stage of flight, thus the number of the persons, who are allowed *piloting*, has to be not less ***than two*** …. (*our italics*)". The performed procedural analysis has revealed discrepancy of technocratic algorithm of the interrupted take-off to requirements of this item- 2.2.10. [7] because of the following ergonomic shortages: the incomplete list of composite working operations of algorithm; not optimum distribution of functional duties between pilots; the absence of mutual secure; **COP** is practically completely eliminated from the contour of management (the control, secure) by the direction of movement of the plane on **RW**; essential time interval during which **CAP** has to distract from active management by system "crew - plane" for performance of his part of "refusal prevention" algorithm; the big opportunity of a mistake (at the choice of managing, indicative and signaling organs of the working engine), because of the requirement to operate only by working engine; significant excess of time of performance of the algorithm in comparison with that time which is necessary to stop the plane within the calculated length of **RW**; the danger of getting out of **RW** at the interruption of take-off because of refusal of the engine at speed of decision-making ($V=V_1$), specified in **FM**; the danger of getting out of **RW** because of not providing running start on "axial line"; inexpediency of some operations, first of all, for **CAP**; unreasonably big intensity of negotiations between pilots.

4. Procedural factors of flight safety of "ergonomic algorithm"

To eliminate the revealed ergonomic reasons of flight danger in "technocratic" algorithm of work of two-member-crew at the emergency interruption of take-off and the revealed discrepancies to certified requirements [7], within the information technology "BPwin" [5], we have carried out its optimization, from the position of human factor. As a result we have created an appropriate "ergonomic" algorithm which takes into account psychophysiological peculiarities of the pilot as "human-operator" [2].

The basic aspects of ergonomic optimization were: full transfer of the control and management by engines to **COP**; simultaneous management by both engines (without the choice only working one); accompany by brief commands and reports only "key" working operations and tasks, and also a concrete definition and reduction of the text duration in negotiations between pilots.

The comparative estimation of the characteristics of "UDP" analysis has shown, that at ergonomic algorithm, in comparison with technocratic, the number of working operations carrying out by **CAP** and needing to be secured by **COP** essentially reduced. As a result, he has got more favorable conditions for realization of active management by the direction of the safe movement of the plane, for the analysis of flight situation and for command by the crew. Due to the reduction of number of intellectual operations the level of psychophysiological tension has decreased, the intensity of negotiations between members of the crew has decreased, inexpedient operations have been eliminated and the opportunity of confusing them essentially reduced (table 1).

According to "ABC" analysis, duration of performing "ergonomic algorithm" (26.78 second) is 1.83 times as little as technocratic one (49.12 second) and 1.1 times as little as calculated on "aerodynamic" graphs (28.40 second), that with a stock, provides the distance of interrupted take-off even in "the worst" conditions of running start.

Thus, the time of **CAP**'s participation in direct realization of ergonomic "refusal prevention"

algorithm became 5.45 times as little as before and equals 3.17 second, (12%) of the whole duration of his participation in parrying the refusal. Such positive effect appeared mainly due to transfer the management and the control of work of engines to **COP** and elimination of unnecessary commands. His loading in working hours has increased from 65% up to 88% (23% more), concerning duration of ergonomic algorithm

As a result of ergonomic optimization of algorithm of the interrupted take-off, **CAP** has got an opportunity, practically continuously (88% of time), after refusal of the engine to continue operating safe movement of the plane on **RW**, to order by the crew to interrupt the take-off and, if necessary, to organize emergency evacuation of air passengers. And the role of **COP**, in percent of time of participation in providing the interruption of take-off, has become 23% more. However, despite of such increase, real time (23.61 second) of his work on parrying refusal is 1.35 times as little as "technocratic" one (31.84 second). This fact, together with optimization of procedures on management of engines and the communication between pilots, should promote a decrease of psychophysiological tension of **COP**, on the background of the certain increase in the routine working load.

In other words the "ergonomic" algorithm at the interrupted take-off is more favors for safe movement of the plane on **RW** and for its effective braking after refusal, due to the fact, that **CAP** less distracts from piloting. At the same time, ergonomic optimization has increased professional importance of **COP** in successful realization of the interrupted take-off.

As a result procedural operating conditions of two-member-crew have improved, first of all for **CAP**, and as consequence, professional opportunities of pilots to carry out their functional duties to interrupt take-off have improved too.

Conclusion

1. Two member crew of the plane is the human factor of potential flight danger because of not ergonomic distribution of functional duties between pilots.
2. Ergonomic optimization of procedural and time characteristics of working operations at the emergency stop of take-off, finally, has to provide higher level of flight safety at application by two member crew of "ergonomic" algorithm, in comparison with "technocratic".
3. The information technology "BPwin" (Business Process Modeling) is an effective analytical tool of aviation ergonomics for the description, estimation and ergonomic optimization of algorithms of the plane crew work to provide flight safety from the position of human factor.

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N. Iskhakova, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

ADVANCED PROFESSIONAL TRAINING OF AVIATION SPECIALISTS AS PREREQUISITE FOR EFFECTIVE HUMAN RESOURCE MANAGEMENT

This article describes the specific nature of the political socialization process of the Ukrainian youth under the efficient political education system. Civic education in Ukraine will encourage the development of stable political values, the establishment of traditions in political life and democratic norms of behavior. Further introduction of government civic and political education programs into curricula of educational establishments will harmonize the process of political socialization in the Ukrainian society.

The relevance of the issue has arisen from a lack of political knowledge and competence of general public, especially, young people. Over the decades of Ukraine's independence more than a half of the citizens have acknowledged their lack of political knowledge, political experience, the ability to express their own political interests, to achieve their objectives through the political system and to demand the respect for rights and freedoms by the state. The major macro-social factors of political socialization of young people in Ukraine are social and economic crises, political uncertainty and controversial reforms. That's why civic education is becoming ever more urgent in Ukraine. It can become an additional instrument for preserving democratic values, norms and behavior patterns.

The article defines the essence of civic education and features the process of political socialization of the Ukrainian youth under the influence of the efficient political education system.

The School of Political Didactics in West Germany used to carry out study in this field. To bring together the issues of political socialization and education they published the book "Political Socialization and Individualization. Prospects and Chances of Political Education" under the editorship of W. Heitmeyer and J. Jacobi in 1991. According to A. Scherbinin, the studies on political didactics are a kind of transition from the theory of political socialization to the practice of political education ... as they are focused on the dynamics of the political process "[1, p. 51]. The political and didactics science in Germany had drawn up practical programs since 1960s designed to combine the process of developing youth political consciousness with social and political experience. So, the distinctive feature of the political education and training system is its consistency with political reality. In modern terms, it enables to create the educational process taking into account the values of coexistence in the European community.

American scholars G. Almond and S. Verba highlighted the importance of political education [2] and recognized education as an integral part of the political socialization process that determines political orientation of an individual, provides appropriate knowledge of the political system and its operation, as well as the skills of political participation in order to classify and balance political orientation and establish a pattern of political behavior for young generation.

Domestic scientific literature is getting into the ways of learning and transferring systematic political knowledge under the education and training system. The studies on the issue consider two interrelated concepts: civic and political education.

Civic education is a complex educational activity containing, essentially, elements of political, legal, economic and ethical education. Educational measures aim to form the citizen capable of protecting his/her rights and freedoms and supporting political forces which really present his/her interests in local and central bodies of executive power under the existing legislation [3, p. 45].

Political education is an element of civic education in developing civic consciousness. Civic education means to teach people to live in a modern state, to observe laws, to respect their rights by authorities and democratically meet their needs and interests, i.e. to be a citizen of a democratic state [4, p. 41]. In our opinion, the development of political knowledge should be considered as an ongoing process of political socialization only. The development of knowledge is one of the basic factors in the process of political socialization.

Education plays a vital role in the development of political knowledge. Civic education aims to mould citizen personal traits. Civic consciousness is based on a sense of responsibility, obligation, patriotism (a sense of solidarity, belongingness to the historical destiny of the motherland and the nation), consciousness of being a full member of the social community, a citizen of the country, maturity of the political and legal awareness, as well as respect for the rights and responsibilities.

Thus, the main aspects of civic education is to provide knowledge of rights and responsibilities of citizens, constitutional and legal mechanisms of direct democracy (meetings, referenda, elections, rallies, demonstrations, etc.) and representative democracy (principles of the electoral law, principles of representative government authorities). The prime objective of civic education is to shape critical political thinking, give realistic assessment of political events and rational choice of political positions and views.

Civic education should be provided by civil society institutions under the government aegis.

The state as the main institution of political education ensures a single educational space through building the education and training system. The education authority system is an important institution for socialization of an individual generally and political socialization specifically. The education and training system is a special efficient institution of primary political socialization engaging new generations in the tough world of politics. It offers organic penetration into the complex system of political relations and institutions by shaping a personal idea about the state and power in the society at the routine level, setting patterns of political behavior and attitude to political roles in future, training for political life, and establishing correlation between norms and deviations in political consciousness and behavior.

Contrary to civic education, political education is based on the achievements in political science and is given stage-by-stage: from familiarizing with authority figures, symbols of state, generally accepted norms of behavior to a thorough study of political institutions and their functions, personal attitude to political values, and ability to rationally think and act in politics. One of the key objectives of the educational process is acquisition of political and legal knowledge.

The society has re-focused on new values of democracy due to a number of legislative acts, in particular, the Law of Ukraine on Education (1991) as an attempt to lay the foundation for individual's self-actualization. Today Ukraine has defined certain concepts of civic education backed up by the Ministry of Education, Science, Youth and Sports of Ukraine and the Academy of Pedagogical Sciences of Ukraine. Yet, the government programs should look into the full spectrum of problems the political socialization of Ukrainian citizens is facing with. They should be designed to consolidate the Ukrainian people as political community, notably, the Canadian – Ukrainian Project "Democratic Education" and the Ukrainian Civic Education network Internet project had been implemented by 2002. A range of events took place within the framework of the Transatlantic Civil Society Support Program in 2002-2003 to outline pilot educational programs, to work out course books and hold workshops and trainings [4, p. 48]. In addition, they have been implementing the resolution of the Presidium of the Academy of Pedagogical Sciences of Ukraine on the Concept of Civic Education of Children and Youth.

We believe civic education should be introduced into the education system as a whole based on the national doctrine of developing education in Ukraine in the 21st century drafted by the Ministry of Education, Science, Youth and Sports of Ukraine and the Academy of Pedagogical Sciences of Ukraine. The Ministry of Education, Science, Youth and Sports of Ukraine has tasked with introducing the lessons on civic education in the school curricula providing with the required theoretical and methodological materials.

Moreover, civic education should be spread by civil society institutions, including *youth organizations*, since information is converted into political knowledge based on the personal experience of a young man. Ukraine has made decisive steps in this direction: it has built the system of public youth organizations which are growing in number due to the comprehensive regulatory framework.

However, most of them are not numerous and remain obscure to and unpopular among the young people. For instance, the opinion surveys conducted over the past 8 years indicate that less than 3% of young people in Ukraine are members of youth organizations. This is despite the fact that youth organizations have to encourage the youth in self-organized participation in politics.

Indeed, the social activity develops political consciousness and culture of the young man.

Government authorities should welcome youth initiative, their desire to participate in organized activity of the society and the state and to gain self-fulfillment of needs and interests. Efficient activity of youth formations and associations where they set out rules, codes of conduct, duties and responsibilities is also of especial importance. Consolidating the efforts of youth organizations should provide the young people with practical political experience, skills and political activity.

The Ukrainian educational system (both civic and political) is geared to create conditions for the development of an individual as a citizen of Ukraine, form democratic ideology, political culture, active citizenship, professional attitude, preservation and maintenance of cultural and historical traditions, respect for the symbols of the state, institutions, language, culture, history of the nationalities living in Ukraine among children and young people. Our educational system also develops the culture of interethnic relations to consolidate the Ukrainian people into the Ukrainian political nation as unity of the citizens who, regardless of their social and group differences, enjoy equal rights, responsibilities and common political culture, have a strong sense of solidarity and patriotism. Based on democratic institutions of political power and forms of political participation, constitutionally established rules and procedures they are engaged in self-government and exercise their legal and political sovereignty.

The successful primary political socialization identifies young people with a particular country and creates the need to belong to a particular state. In the event of the weakened value-regulatory system, political socialization turns to be unsuccessful and the destructive potential accumulated in the society is reproduced.

The political socialization in the Ukrainian society occurs in various social, economic and socio-cultural conditions and is different for children upbringing in various social groups and communities. It shows social contradictions even at the pre-conceptual stage. The situation is complicated by the fact that modern educational establishments in Ukraine are undergoing reforms seeking new forms and methods for efficient political socialization amid political and economic development of Ukraine's statehood.

Therefore, the issues of political and civic education in Ukraine require thorough study. In particular, one should draw special attention to the introduction of political knowledge into educational programs, publication of course books on political education in line with the requirements for the transitional society and acquisition of civic skills and knowledge.

Conclusion

Given the heterogeneous impact of the above mentioned factors, the dominant trends towards harmonization of political socialization processes in the Ukrainian society reflect further introduction of the government civic and political education programs into the education curricula. The programs should provide formation of civic identity, a sense of solidarity and patriotism among children and young people. The educational component of political socialization should be supplemented by a set of educational activities conducted by the Ministry of Education, Science, Youth and Sports along with all other establishments and the Ministry of Culture. Youth gain practical political experience and skills owning to the consolidated efforts of youth organizations and political parties. Information awareness ensures competent participation in politics and creation of a common communicative space. Social and economic transformations need stable social structure in the society and the formation of a middle class.

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E. Luzik, Dr. Sc., Full Prof.
O. Akmaldinova, PhD, Prof.
(National Aviation University, Ukraine)

INTEGRATION OF HUMANITIES AND SCIENTIFIC-NATURAL KNOWLEDGE IN THE COURSE OF PROFESSIONAL TRAINING OF FUTURE AVIATION INDUSTRY SPECIALISTS

The article is devoted to the solution of the currently topical issue of higher professional education – integration of humanities and technical knowledge as the foundation of effective vocational training of future specialists for the aviation industry.

Introduction

The quality of modern higher education has been and remains the topical issue for research by the pedagogical community, which is declared in the UNESCO policy documents in the field of education. This accounts for continuous search for the ways of improving educational systems and enhancing their quality.

Pursuant to the normative ICAO documents, a modern specialist of aviation industry, along with professional training, must have such a level of general cultural development that would allow him to be freely and effectively oriented in dynamic and fast changing reality. It is for this reason that competitiveness of a modern aviation higher educational institution depends not only on its future specialists mastering specificity of the relevant specialty but on their versatile humanistic culture, creative thinking and upbringing as well. The major means of solving the task of forming a harmoniously developed personality able to adapt to fast changing dynamic conditions of life, in our view, is integration of scientific, natural, professionally oriented and humanities knowledge [1].

Main content

Modern information society puts forth new requirements to the ways of obtaining and transmitting knowledge. Coming to the foreground are tasks of principally new designing of academic process models, constructing contents and organizing teaching material, pedagogical activity of the one, who teaches, as well as academic activity of the one, who studies, in the education space. Integration of scientific-natural, professionally oriented and humanitarian education drastically changes the character of academic process, allows to completely reveal both a student's and a teacher's creative potential which makes it possible to radically enhance the quality and firmness of the student's universal, not only professional, knowledge, forming his personality culture and world outlook.

This is due to the fact that the process of integration in different fields of human knowledge causes strengthening of interdependence, unity of all the elements and harmonization of relations which accounts for the formation of a qualitatively new integral system with higher effects and organizational level achieved.

Introduction of integrated courses into the academic process of aviation higher educational institutions (HEI) allows building up integrity of environment perception by a trainee, common perception of the world, which results in forming elements of a specialist's integrative culture. Thus a student acquires integrated (complex) skills that include a spectrum of humanitarian, social, general scientific, general technical professional and polytechnic skills [2]. In addition, the use of integrated courses is instrumental in forming flexible and holistic reasoning characterized by the action-oriented basis of high generalization level.

Elaboration of such integrated courses is based on the main scientific guidelines of modern higher professional school pedagogy, the new scale of values of which being characterized by: humanization and humanitarization, personality orientation of education, development of technologies, aimed at activation of students' cognitive activity and optimal satisfaction of their needs in moral and cultural growth. That is why we see the guiding strategy of integrating the humanities and scientific-natural knowledge of higher professional education in the personality-

activity approach where a student – a future aviation industry specialist becomes a subject of his own activity and self-development in an integral pedagogical process, forming self-dependence and responsibility for the results of everything he creates and executes.

Therefore, to form a personality of a student – psychologist in the aviation industry an integrated training course "Mathematical modeling in psychological and sociological research" is proposed to be used in the academic process at the Institute of the humanities of the National aviation university. The course envisages organization and supervision of students' academic activity on the basis of fundamental liberal education and profound professional knowledge, abilities and skills, simultaneously, by means of mathematical statistics methods through integration of the humanities and technical knowledge which is aimed at comprehensive development of a future aviation specialist and his mastering special subjects knowledge. The author's training course offered to students of specialty 6.030102 "Psychology", made up of three modules, includes teaching material of the following previously studied academic subjects: higher mathematics, information science, programming of psychological research, mathematical statistics, and experimental psychology. The selected main tasks of the integrated academic course were:

- determination of possibilities and limits of mathematization in psychology for future specialists of aviation industry;
- eliciting mathematical psychology content as a system of methods for scientific cognition of psychological processes and phenomena by means of mathematical statistics tools;
- developing principles of the choice and evaluation of mathematical methods validity for various psychological tasks solution;
- determination of possibilities and ways to create a special mathematical mechanism of psychology for the purpose of investigating the outer world representation processes;
- identification of principles and methods of modeling psychological processes of human activity and ergatic systems.

It allowed to build up the following productive knowledge and integrated abilities:

Productive knowledge (K^T is knowledge of theory).

1. Basic concepts of statistical methods for mathematical processing of experimental data – K^T.
2. Measuring scales for obtaining accurate results of research – K^T.
3. To distinguish the features of selecting criteria for detecting divergences in the tested characteristics from other methods of characteristics study – K^T
4. To ground the use of criteria for verification of accuracy of deviations in psychological research – K^T
5. Use of appropriate criteria for estimation of deviation changes in mathematical processing of research data – K^T
6. Selection of multifunctional statistical criteria among others for solving practical psychology tasks – K^T
7. Selection of the grade correlation method among other methods of statistical processing in psychological research – K^T.

Integrative abilities (K^A is knowledge of algorithm).

8. Classification of methods for solving professionally oriented psychological tasks – K^A
9. Determination and application of algorithms for calculating relevant divergence criteria in psychological research – K^A.
10. The use of divergence criteria for mathematical processing of relevant practical psychologist tasks – K^A.
11. Forming an algorithm of decision-making on the choice of changes criteria – K^A.
12. Forming an algorithm of decision-making on the use of multifunctional statistical criteria – K^A.
13. Practical application of multifunctional statistical criteria for practical psychology tasks – K^A.

14. Forming an algorithm of decision-making on the use of Spearman's method of grade correlation – K^A.

15. Practical application of the grade correlation method for mathematical processing in psychology – K^A.

Thus, this course covers both personality and professional aspects of a future aviation specialist formation.

In addition, an important element in taking integrated courses is organization of subject-subject relations, which is connected with a joint search for methods for dealing with multivector psychological and pedagogical issues. So the issue of designing the structure and content of the course, as well as the choice of ways, methods and means of exercising influence upon students, aimed at developing student's individuality and building up his mental subjectivity via the personality-activity approach has become an important aspect of utilizing integrated courses in the academic process. It is for this purpose that practical classes in this integrated course envisage paying special attention to such innovative technologies of teaching as business and situational games (for introducing appropriate mathematical criteria into psychological research); elaboration of role-playing projects (for solving social and psychological problems); case-study and portfolio (to brisk up students' cognitive activity in the course of independent quasi-professional activity) etc.

Besides, pedagogical researches have proved that one of the most effective structures of co-operation between a teacher/trainer and a student/trainee in the context of integration as a process of humanization of higher professional education becomes context-project education involving the individual-creative approach technologies, whose main purpose is to reveal and develop creative abilities of a personality, to create conditions for his self-actualization. This approach allows to cover mechanisms of general and professional self-development of a personality, facilitating the development of inner motivation for academic activity with mastering the organization of self-movement towards the ultimate result [3].

Humanitarian training of aviation industry students integrated with mastering professional technical knowledge, abilities and skills, results in developing the student's so-called integrative culture that ensures formation of a future specialist's complex (creative) abilities including the development of both professionally meaningful and personality features of a student. In the course of studies students move gradually to supraliminal mastery of the technology of humanistic engineering activity, that allows to be competitive not only in their field but is also instrumental in obtaining a universal highly skilled grounding with a wide range of practical opportunities, i.e. the opportunity to master allied trades. Thus, we consider an integrated course as a course the study of which is instrumental in deepening and broadening intersubject productive knowledge; building up integrative abilities, which can be developed on the basis of arbitrary types, forms, ways, methods and objects of interscience integration.

What basic methodological guidelines of designing integrated courses can we propose? They are as follows:

- multisubject integrated or universal courses admitting substitution of a number of fundamental courses (for example, the course of natural subjects including philosophy, chemistry and biology for aviation industry psychologists). The peculiarity of these courses consists in the necessity to introduce them as early as possible (beginning with the first semester), implementing in this way a more logical sequence of studying subjects of general scientific cycle, provided certain pedagogical conditions and technologies are followed;
- integrative courses created on the basis of related sciences that have resulted from the emergence of new natural sciences and scientific subjects (for example, age-related and pedagogical psychology, differential and experimental psychology, mathematical modeling of psychological research etc.), or on the basis of core sciences that permeate all fields of modern knowledge (for example, information technologies in psychological research). The content of integrative courses of this class built on the basis of structure and logic of these sciences contents allows to develop the so-called students' "global thinking", which is characterized by high self-organization, profound professional knowledge, creative intuition, aspirations to self-development ;

- integrative courses are based on the study of complex objects (Earth, biosphere, man and his environment) that have led to creation of these courses (for instance, psychology of life activity, world environment ecological problems, conflictology, psychology of extreme situations, psychology of professional activity, fundamentals of aviation etc.). The essence of integrative courses of this class consists in considering different views on the concept of an object, systematizing its properties, building up integrative abilities and skills as well as productive knowledge;
- the foundation of the problem type of integration of natural scientific knowledge is the endeavour to design integrated courses for solving both local and global issues (for example, psychology of life activity, global environmental problems, human factor in aviation, psychology of extreme situations etc.).

Thus, philosophic comprehension of real problems a specialist faces in the production process requires from a future aviation university graduate profound knowledge of not only fundamental general scientific, general technical and technological subjects but also thorough knowledge of humanities: philosophy, sociology, pedagogics, psychology, jurisprudence, ecology, in particular, and others. Besides, a new definition of education as a condition of making a future specialist a professional subjectivity is connected with deeper understanding of higher professional education: not simply as the process of transmitting knowledge, abilities and skills, but as a process and result of a human's self-determination as well as that of the society, nature, space, his own role in preserving and beneficially transforming the world, that is being a professional in a chosen field, being a personality able to successfully act in the continuously changing world of a high degree of uncertainty, being a person of versatile humanistic and humanitarian mentality, relying on the cultural heritage of previous generations.

Judging from education as an open dynamic system that must ensure the future specialist's ability to analyze changes, to foresee future, to react flexibly, the role and aims of professional training in the system of technical education are changed, namely: the study of laws of harmonious correlation of the nature and society and modern preparation of possibilities to practically use them. Hence, integration of the fundamental nature (general scientific and humanitarian cycles of training), step-type cognition (general technical and professionally oriented courses), building up creative mentality based on principles of project-context training (professionally oriented subjects, humanities and scientific subjects as well as the cycle of professional educational courses) and philosophic principles of world outlook positions of a future specialist will contribute to the formation of modern technical education philosophy as an integrated (intersubject) field including the values, humanitarian and ethical parameters which integrate natural-scientific, general and special technical knowledge as well as humanistic principles, and make up the foundation of both world and domestic cultural traditions. At the same time, teaching integrated academic courses, in our view, serves as a theoretical basis for the development of applied scientific research in aviation university. Therefore a number of major fundamental moral and aesthetic imperatives must underlie the improvement of the contents of integrating the knowledge of humanities and scientific natural knowledge in the course of professional training of future specialists for the aviation industry. They are:

- universal values (norms of interpersonal communication);
- nation-oriented values (the concept of national self-determination, national cultural tradition);
- values of the modern world (democracy, human rights, freedom of choice).

It is these moral and aesthetic imperatives that allow, as a bearing structure of aviation specialists systematic training, to form the essence of a harmoniously developed person – an educated, cultured, physically and morally healthy, socially oriented creative personality holding an active social position in a fast changing society. This is, first of all, harmony of different levels of thinking: subject matter, operational, theoretical, constructive-heuristic, global and personal, that, in turn, requires reorientation of academic process in aviation higher educational institutions towards a qualitatively new technology of training which would have a multipurpose character.

Let us point out some basic directions in the solution of this problem. First of all, it is penetration of the humanities knowledge and its methods into the contents of natural-scientific and technical subjects. Secondly, reorientation of historical fragments of natural-scientific subjects towards humanitarian policy. Thirdly, complex mastering of theoretical knowledge about a man incorporated into technical systems which will contribute to the development of human cultural content of technical education. This content should find influence in the world outlook principles of scientific and engineering concepts, in the history of inventions and discoveries, in dramatic life stories of outstanding scientists and engineers. Besides, underlying reserves of aesthetical experience and upbringing in the fields of science and engineering are practically inexhaustible. We should not neglect ethnic-cultural factors of technical and natural-scientific creativity which is also one of the means of building up students' understanding of integrated knowledge contents as the essence of all human activity.

Conclusion

The research conducted allows to generate new approaches to designing education technologies for gaining effectiveness of future aviation specialists professional training:

- the use of competence-activity approach to designing the structure and contents of educational material of integrated courses;
- project-context structuring of independent activity of future aviation industry specialists;
- personality-activity approach to education where the activity itself (creation of the world image and its cognition in the context of creation) and personality (as personal responsibility for one's own creation) come out on top of the academic process.

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M. Rohozha, Dr. Sc., Prof.
(National Aviation University, Ukraine)

HUMAN FACTOR IN AVIATION: PROFESSIONAL ETHICS MATTERS

The paper deals with human factor problem, basing on organization ethics matters. Ethical documents of international and Ukrainian air companies as guidelines on professional moral conduce are analyzed.

1. Human factor in aviation: Humanities' focus

Aviation is the sphere of activity where human vulnerability is evident at several dimensions at once. No accident that the notion of human factor is actively elaborated in interdisciplinary aviation researches. The notion of human factor contains "the set of psychological, medical, and biological parameters which define optimal conditions for aircraft operation and air traffic management" [7, P.197]. Defining human factor as *ad hoc* notion, the authors of "The Encyclopedia of Aviation Safety" outline the possibility to introduce it in interdisciplinary field. They expose its multifacetedness, while emphasizing: "Many-sidedness of this notion demands to research it at the base of scientific knowledge, taking into account conditions of people life and work, peculiarities of their interaction with aircraft, standards, rules, environment as well as their coherence in their cooperation" [7, P.198].

Direct dependence of aviation safety on human qualities is proved by psychologists. Thus, correction of human behavior according to demands of profession is in need in aviation. It will allow to increase aviation safety in general and clients of air companies in particular, and to attract attention of new customers of aviation services. Comprehending current experience, aviation professionals conclude: "Analyzing deeply, it is possible to mention that human factor covers the whole complex of factors which are connected with material and spiritual conditions of human life and influence on efficiency of processes there" [7, P.198].

Topical issues of human factor problem are the following: personnel motivations and value preferences, efficiency determinants, behavior and decision-making preferences, occupational selection system, and personnel training [7, P.198].Contents of issues mentioned testify that humanities and social science are directly connected with research of human factor in aviation. They are personality psychology and social psychology, linguistics, sociology and so on. Among these practically oriented disciplines such traditionally philosophical branch of science as ethics has to be mentioned. However ethics is actual here not so much in its theoretical or methodological aspects but in its practical and applied dimensions.

2. Substantiation of professional ethics

Ethics is the special field of knowledge, directed on comprehension, correction, and optimization of value-practical coherence of human relations. Long time ago practical orientation of this science became evident for Aristotle. He emphasized: "We are inquiring not in order to know what virtue is, but in order to become good" [9, 1103]. Traditional claims of ethics to impel human to moral virtue (to value oriented activity) achieve additional impulses because of the impetuous development of a number of interdisciplinary applied and professional ethics.

Professional ethics is moral system of regulation in profession. It produces definite moral norms and rules, which shape optimal type of human coherence in professional activity. Any professional ethics is represented at two levels: at the first level – as codes of professional conduct, i.e. proper ethical regulation of professional activity; at the second – as the foundations of this regulation, i.e. as metaethical reflection on professional ethics. The framework of such structure for professional ethics was outlined in "The Ethics Glossary" [6, P.278].

Developing the agenda to structure professional ethics, it is possible to mention that at the first level professional ethics is "practical ethics" and consists in analysis of real moral practice.

Professional ethics as practical ethics deals with "imperative and value content of definite kinds of activity <…> [with] those professional relations, which human enters in the process of realization of different definite kinds of activity, as well as with its socio-cultural conditions, its ethos, normativity and those social tools and vehicles, by means of which its efficiency is provided" [1, P.177]. Such definition of practical ethics refers to the first level of professional ethics, it registers its codified and spontaneous components, codes and professional ethos, respectively.

There is a notion "corporate culture" in professional ethics. Corporate culture is special kind of ethical regulation of professional activity. It is shaped spontaneously, and its second name is professional ethos. It is formed unintentionally through cut and try method. In the process of alive moral practice norms shaped in ethos are selected, crystallized and fixed in professional practice due to experts' activity [2, P.104). While crystallizing in the process of permanent reproduction in everyday professional situations, norms of ethos are codifying and shaping the system of specific rules and norms which regulate professional activity. A code of professional ethics is the product of crystallization of ethos.

Traditionally, professional ethics is created in areas connected with specific social functions of profession, such as management, medicine, law, police and military service, sports, policy, science and so on. All these professions deal with clients, customers of professional services and are potentially able directly or indirectly to damage humans. Mission of professional ethics is properly practical: "To remove or mediate tensions and contradictions which appeared between general moral principles and decisions a person has to make, while fulfilling one's professional duties" [1, P. 179-180].

Traces to promote ethical regulation in professional activity vary in different spheres. They depend on specific content of profession. However, general algorithm is the same in all spheres: (1) ethicists analytically define ethically meaningful aspects in professional ethos; (2) ethicists, representatives of profession (and sometimes public) jointly discuss results achieved by ethicists and create recommendations according to definite moral principles; (3) at the result of such discussions principles of profession are formulated and professional code is created [1, P.185].

All these ideas can stay at the level of pure theory without further implementation of ethical regulation in professional activity. It is possible to follow ethical values in everyday professional activity due to direct institutionalization of ethics. Institutionalization occurs through production of tools for value management; motivation of staff to follow codified norms and principles; monitoring of personnel in fulfillment of ethical norms of profession; correction of professional conduct [3, P.82–84]. To achieve these results ethical infrastructure in organization is created. The next tendency becomes strictly evident: the more organization is directed to efficacy of professional activity ethical regulation, the more it promotes professional code and motivates ethical conduct of personnel, creates ethical monitoring structures and gives them authority.

Expansion of ethical regulation to specific fields of human activity reflects problems were born by technological progress and its potential and actual threat to humans. Studying the content of ethical regulation of professional activity, ethicists conclude that professional ethical codes "introduce social responsibility dimension in profession and direct professional activity on common good" [1, P.180]. It is noted that direction on common good can be developed even indirectly, through orientation on private good of some groups, interests of which are directly of indirectly affected by definite professional activity.

3. Professional ethics in aviation

In civil aviation interest to human factor testifies the orientation of definite groups on private good. Requirement to account socio-cultural dimensions in aviation is reflected also in human factor management [7, P.210]. Putting these components into the structure of professional ethics substantially enlarges possibilities to regulate ethically this sphere and resolve questions put on inside profession. Aviation safety professionals mention: "Moral and psychological components of human factor are evident in orientation of an aviation professional on a passenger (client), on air company and on oneself in the framework of corporate culture" [7, P.212]. Thus, aviation

professionals themselves emphasize ethical dimension of corporate culture. They define corporate culture as "the system of values, aims and norms typical for organization and compatible with professional aims and tasks" [7, P. 212].

Civil aviation is the field concerned with carrying and providing of air transportation, with professional activity of crew, flight service, ground handling service, and air management. Each of these professions has different needs in ethics. It should be emphasized that proper ethical component is actualized only if the situation of moral choice, and if a professional has to make deliberate, free and right choice. Aviation is the sphere of activity with minimum of free/ voluntary professional actions. Professional freedom there is strictly limited and subordinated to definite rules and instructions which regulate safety. A number of aviation professions demonstrate this tendency in full; first of all, these are crew and dispatchers.

Professional psychologists who care of moral and psychological climate in crew note that efficiency of crew depend "in considerable degree on leader qualities of crew commander and his abilities to rule the team work, and on the skills of crew to keep optimal relations with each other" [7, P.201]. Moral and psychological climate in crew team depends on high level of mutual understanding and interaction, ability to grasp project and intensions of others, to know vulnerability and individual peculiarities of others, ability to compensate shortage opportunities of one team member by skillfulness of others" [7, P. 208].

It is very important to mention that solidarity of a crew is shaping in cooperation and correcting in regular learning programs; and in general, the work of the crew is built at the rigorous fulfillment of instructions. Safety aviation professionals consider that high level of psychological competence of every pilot is one of the main conditions of reliability of a crew as an integral team. Also they emphasize that reliability is shaping during special learning courses with considerable psychological component: "Crews have to know good socio-psychological phenomena which are able to influence on joint activity, be able to recognize timely these phenomena and overcome dangerous tendencies" [7, P.209].

Thus, situations of *moral* choice in everyday cooperation of crew are minimized and moral matters in professional cooperation are regulated by rules of professional etiquette. Professional etiquette is constituted by rules of professional conduct in standard situations of professional activity. "As a form of conduct regulation etiquette is ethics minor" [8, P. 589]. Such ethics minor basically is limited by culture of conduct, simple rules of civility, which are directed to provide benevolent atmosphere in a team.

The same correlation of psychological and etiquette components can be found in professional activity of dispatchers.

Thus, ethical dimension of professional activity is activated in those aviation professions, which are in close interaction with customers of aviation services, and first of all with passengers of civil aviation. Communication with clients of air companies in daily professional activities is in duty of in-flight services as well as of handling services (such as registration, ticketing, meeting and boarding, lost and found and so on). These are the areas of professional activities of high ethical tension, and here professional ethics as the system of moral regulation in profession is in charge.

4. Analysis of organization ethically oriented documents

Every company arranges its work with clients basing on clear articulated policy. It can be appointed in internal documents. Also it can be publically declared if a company is interested in informing partners and clients in principles of its activity. Usually, organization policy is introduced in the form of various self-presentations on the company web-site, in promotional materials and so on. Ethics in charge in organization policy can be demonstrated on the definite samples. Let's analyze two examples of different scale and rate: value foundations of customer service in international air company "Delta Air Lines" and a code of professional ethics in Ukrainian air company "Aerohandling".

American company "Delta Air Lines" is one of the biggest air companies in the world. It has about 75 000 staff in the parent company and in almost 20 divisions and subsidiaries. Special

learning programs, probations, and refresher courses are usually organized in the company and guided by high level staff tutors. Let's examine the content of the learning courses for employees who have direct contact with passengers (ground handling service, call center, ticketing).

To increase the rate of sales, Delta organized learning "The Delta Way to Selling". One of the important components of the program is teaching rules of polite communication with clients, so called professional communication with clients. The learning is designed in such a way that rules and pieces of advice are given ex parte. Such form allows trainee to enter the situation of contact with client. A trainee is recommended to be compassionate, to concentrate oneself on needs and desires of the client, but do not impose oneself. They are taught to find individual approach to a client, to listen to attentively and do not interrupt. Different variants of polite conversations with clients are introduced in the learning handouts. Ex parte a client is mentioned "Give me your full attention; make me feel like I'm the only call you've had all day".

For Customer Service staff the learning program "First Point of Contact" was created. Its mission is to teach personnel to act in unforeseen circumstances and service failure circumstances. Tutors represent detailed descriptions of service failures and non-service failure situations and give examples for each variant. The Delta service failure is defined as "the inability to provide the standard services that Delta has committed to, or agreed to provide". There Delta bears responsibility and repairs client's damage. A non-service failure is a force majeure situation in which Delta has little or no control but which damages Delta's clients or leads to Delta service failure. The scale to estimate failure and guidance to evaluate measure of damage and provide staff with necessary knowledge and techniques to resolve a problem are given to trainees.

Noteworthy, while resolving proper business problem, personnel must seek ethical decision. Delta "wants to do everything possible to ensure that the customers walk away satisfied when they come to the Airport Customer Service with the problem or an issue. In order to do this agents must show empathy, listen attentively and correct any situation on the spot".

Psychologists specialized in clients' behavior noticed that often immaterial compensation is more important than material one. In such cases sincere apology is very important tool. Psychologists clarified that often in service failure cases "all a customer wants is sincere apology". In all ethically ambivalent situations empathy is recommended to use. Empathy is compassion, sympathy. "All service failure and non-service failure situations require empathy". Personnel of customer service are taught to act with empathy. "Empathy is the action of understanding, being aware of, being sensitive to, and experiencing the feelings, thoughts, and experience of another". Moreover, "the ability to have empathy for a situation is the beginning of true 'service from the heart'".

At the same time, the next recommendation looks morally ambivalent: "Be knowledgeable. I can't believe you or trust you if it is obvious you don't know what you are doing". There are two differently directed components in such approach represented by tutors. On the one hand, trainees are proposed to create a base for trust by their competence. Really, capacity to remain calm and do not admit panic in crucial situation, demonstrating competence, creates background for constructive actions in resolving current problem. On the other hand, the question about the value of confidence in crucial situation brings up, especially if incompetence of an agent becomes evident to a client.

It is one of the dilemmas of professional ethics; and it exposes "tension and contradictions between professional and common principles" (R. Apressyan). In addition, this dilemma touches theoretical question about criteria of moral action [5]. In the light of these issues one more topical ethical discussion has to be mentioned – on acceptability of instrumentalization of ethical knowledge and ethics at all to resolve business questions [4, P.33–34].

Analysis of two Delta learning programs allowed us to define a number of basic ethical principles in the Delta policy in client service; they are: compassion, empathy and trust.

The second example is Ukrainian air company "Aerohandling". It serves one of the biggest Ukrainian air companies "Aerosvit" and a number of other air companies in airports of Ukraine. Among areas of its activity are: immediate work with passengers, registration of passengers and luggage, including baggage tracing service. It is mentioned at the company web-site that Aerohandling provide learning programs for client service personnel and maintenance flight

control. Paying attention to the quality of service and keeping international standards in its activity, Aerohandling initiated creating of the Code of professional ethics and its implementation in organization activity.

The Code fixes professional obligations of staff in front of clients and regulates staff professional interactions. It is mentioned in the preamble of the Code that personnel recognize responsibility in front of organization and clients, and aim to follow international demands to serve passengers. Professional activity of the personnel is based on general moral principles of honesty, legality, decency, and responsibility. Particular principles are formulated at the base of general principles. Thus, employees have to keep confidentiality, to respect human dignity of clients, to be honest, not to use official position for private benefits, not to tolerate corruption and bribery, not to exceed authority.

Regulation of professional interactions is founded at the teamwork principle, which consists in coherence, mutual aid and support. Personnel aim is to create "stimulating working environment for every employee and encourage one's intention to develop personnel professional qualities". The Code fixes employee's responsibility for teamwork compliance in front of colleagues. Every employee is bound "to keep just, impartial end equal attitude to personnel at the base of mutual respect and trust". Every employee is obliged "to fulfill rules of the Code deliberately". Ethicists note that ethics in charge is impossible without the question about sanctions [1, P.182]. The Code of Aerohandling is not the exception; it emphasizes that "violation of the norms of the code is examined in established procedure" and "employees who violated the code are incurred a penalty up to dismissal".

However, every ethicist see some incoherence in representation of the rules, some reiterative of the values declared, general logical imbalance. Nevertheless, exactly such amateur hint in the Code testifies that personnel created the document they needed by their own efforts. Really, such case confirms that if ethicists do not take part in applied projects, social need in ethics would be satisfied without them by professionals of the fields of practice which need ethical regulation in its activity.

Conclusion

Examples of ethics in charge in air companies are different. But it is evident that ethics becomes the component of aviation safety as it is directed to resolve topical issues of human factor problem. Ethics defines framework for professional cooperation of personnel and outlines strategic direction of communication and interaction with clients of air companies.

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O. Budnikov, Pilot
(Airline «Aerosvit», Ukraine)
E. Savenko, Psychologist
(National Aviation University, Ukraine)

PSYCHOLOGICAL CHARACTERISTICS FEATURES OF THE SYSTEM ERROR VOLUNTARY REPORTING

Principal attention in the article is given to psychological peculiarities of operation of voluntary informing system about errors. An experience of the world community is considered in application of this concept.

The problem of human factor is the principal one in cutout of communications a human being-environment-machine and aviation has been confirming it since first days of existence. According to report of Bureau of Air Safety Investigation (BASI), based on analysis of 75 air disasters, more than 70 % of aviation events happened because of the human factor. BASI accepts the importance of human factor during flights, and marks that the reason of aviation events can be systematic and organizational errors of the crew. Generally recognized mechanism of creating valuable informational sphere attached to work with phenomenon of human factor is a voluntary message system.

The USA became a pioneer of confidential messages in 1975. In a year Australia brought to a close confidential system of voluntary messages about preconditions to air events. Analogous systems appeared in Canada, Great Britain and in other countries. In the USSR this system was brought to a close only in the mid of the 1980s. Some specialists think it didn't get wide distribution because of the mental aversion of this form of voluntary-anonymous information be the soviet community [2].

In the USA there is a wide system of data presentation about air events and incidents known as "aviation safety reporting system (ASRS)". The system ASRS works independently of Federal Aviation Administration (FAA) and is managed by NASA. Pilots, ATC dispatchers, members of cabin crew, engineers of technical service, ground personnel and other collaborators connected with aviation activity can present reports when they think that safety of the flights is threatened. Patterns of the reporting forms are on the website of the system ASRS.

Information bringing into the system ASRS is concerned in the strict confidentiality. All reports before bringing into data base are depersonalized. All personal names and names of organizations are deleted. Dates, time and correspond information that permit to determine personality are deleted.

ASRS dates are used for next purposes:

a) identification of systemic danger factors in national aviation system for following undertaking of correcting activities by appropriate plenipotentiary authority;

b) giving help in making politics and planning within national aviation system;

c) giving help in carrying out scientific researches in aviation sphere, including aspects of human factor in aviation safety sphere;

d) representation of information that favours prevention of aviation incidents.

In addition to that it is accepted an important meaning of voluntary data presentation about incidents for goals of safety flights and a grant of defined immunity from force arrangements to informing people liberating them from punishment for unintended cheatings reporting within system ASRS. In consideration of availability of hundreds thousand registered reports today, mentioned data base gives help in carrying out researches in safety flights sphere – especially in questions touching human factor.

The program CHIRP facilities rising level of safety flights in the United Kingdom in a way of supporting possibility of using the system of confidential data presentation by all people engaged in

aviation. It complements a system of compulsory data presentation about aviation events and incidents, accepted in the United Kingdom. Important features of the program CHIRP are following:

a) independence on plenipotentiary body of regulation;

b) a wide circle of participants (including members of air crew, ATC dispatchers, certified engineers in technical service, members of cabin crew and aviation community in general);

c) confidentiality of communicators' personality;

d) analysis of information by experienced specialists in safety flights;

e) availability of widely expanded informational newsletters for improving safety flights standards at the expense of exchanging information in aspects of providing safety flights; and

f) taking part of representatives of the program CHIRP in working of the whole row of authority in safety aviation for giving assistance in decision of system problems touching safety flights.

Recommendations about introduction of voluntary reporting system are in the guide in prevention of aviation incidents of the International Civil Aviation Organization (ICAO). In addition to that it is marked specially that compliance of principle of anonymity and unpunishability of voluntary informatory is an important element of success of such mechanism.

Accordingly to regulations Applications 13 of the state represent to ICAO information about all aviation incidents touching air ships with maximal certified mass more than 2250 kg. ICAO also realizes information gathering about technical aviation incidents (with air ships more than 5700 kg), that are considered like having important meaning for aims of safety supporting and prevention of aviation incidents. This system is known as a system ADREP. States represent to ICAO particular dates in defined (and encoded) format in advance. After getting reports of ADREP from the states this information is examined and is concerned in electronic format making data bank about aviation events and incidents in the whole world that is available for all member-countries [3, p.114].

After getting information from data bank about aviation incidents state authorities of control for SF and operators of air industry design complex of actions that will allow preventing similar events in future.

Besides state systems of data representations about incidents (as compulsory as voluntary) a lot of air companies, suppliers of ATC service and airport operators have *"internal"* data presentation systems about danger factors and incidents. On conditions of availability to the whole personnel (and not only for flight crew) data presentations functioning in the companies of the system assist development of constructive safety culture within those companies [3, p.115-117].

In Ukraine mechanism of voluntary reporting is used actively by only the grandest Ukrainian air companies such as "MAU", "Aerosvit".

Confidence information is possible on conditions if pilots are sure that their message will be concerned in the secret and will be analyzed with anonymity observance. Because of that pilots inform not only about mistakes that became explicit, but about mistakes that were known only them. The pilots' messages are brought into the data base about dangerous factors and are subjected to treatment inside of statistical row with analysis of mistakes reason.

Using the practice of voluntary reporting have a lot of advantages undoubtedly, home air companies get access to them that brought it in using. However there are disadvantages in practical realization of any concept.

According to the system of VR, we think, it's necessary to accent that pilots can inform not only about own drawbacks in the work, but about mistakes made by other members of crew. In addition to that anonymity is guaranteed to them. And it means it can't except that it can create additional psychological disharmony inside of the crews of post-Soviet air companies.

Pilots having big air experience and conducted by "chkalovets" learned well in their subconsciousness that every mistake in the sky always has very big, often measureless price. This concept was oriented on very their mental characteristics. But in their environment the system of voluntary reporting about errors hasn't got accustomed in the post-Soviet air companies. That is the system exists formally but in effect doesn't function in specified format. And it's naturally – for

these people voluntary reporting is similar to Pavlic Morozov's reporting, "stukachestvo", because their mentality says "not to wash one's dirty linen in public". Experienced pilots very often use SVR in quality of mean for departure from responsibility for made mistakes (sometimes for cheating).

From another side, new generation of pilots growing firstly in symbiosis with this concept, which essential part is a postulate about tolerant treatment to mistake and about its imminence ("a human being can't be mistaken") loses very important characteristic in its arsenal. Consciousness of acceptability of mistakes in air work. If it isn't punishment for mistake (in case of timely reporting about it), it means it isn't terrifically to make it. As a result young pilots' forming availability to inform confidentially and with impunity about mistakes provokes that psychological evaluation of mistake value reduces and the question appears: will be able the pilot evaluate adequately risk degree in which he goes?

In terms of researches carried out in transport psychology sphere we can say that subjective price of risk (about which we are speaking) has a lot of general things with subjunctive safety. Such subjective price of risk depends on the subjunctive probability of particular event, from one side, and from subjunctive meaning degree of this event for pilot. As soon as subjective price of risk is activated, by means of making defined decisions, changes in conduct may be realized, that assist removing feelings of danger that is it is accepted false feeling of danger.

In the capacity of possible reasons of this phenomenon are named next: - processes of sense (overvaluation of speed meanings, undervaluation of one's possibilities, and overvaluation of own pilotage possibilities, ignoring of negative examples of air incidents); - leading decay of feeling of danger in the same time with overvaluation of pilotage experience; - little set of conceptual models (imagination and presentation) of future moving conditionals AS; - negative consequences of education only in "sparing" conditionals; - undervaluation of great meaning of transport problems in aviation sphere from side of public opinion.

And this carelessness can be not only very high but very steady [4].

Visually, Ukrainian operators should "prepare" new generation of pilots to the VR concept. Firstly to crystallize in their subconsciousness setting that "any mistake in aviation – is illegally, its price could be own life, other people's lives that's why it couldn't be made but it couldn't be afraid". And only then, having assured in stability of this pattern, they have to work on the forming of availability to inform about mistakes which couldn't be avoided. This preparing should begin very before a young pilot will taste flight sweetie. Principles of selection, education, trainer preparing, value and development of air crew should be reviewed.

Thereby, from one side, voluntary reporting concept, realizing on the principles of confidentiality and unpunishability, grants to air companies an access to invaluable information about what happens in flight actually. This information gives opportunity to take measures in prevention mistakes in cutout a human being-environment-machine on the local level (in particular air company) and in universal scale. But from other side, psychological model lying in base of this concept creates conditionals itself for forming mental environment, potentially loyal to increasing probability and difficulty (fatality) of a mistake, imminently standing us before necessity of adaptation of machinery realization of this concept to conditionals of functioning modern Ukrainian air companies.

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O. Secheyko, PhD, Assoc. Prof.
V. Riabchenko, MA (Psychology)
(National Aviation University, Ukraine)

ASSESSMENT OF ATC STUDENTS' PSYCHOLOGICAL READINESS FOR PROFESSIONAL ACTIVITY

The article zeroes in on psychological component of Air Traffic Management (ATM) specialist professional training. The role of air traffic controllers' (ATC) personal readiness within the framework of professionally important qualities was determined. The article presents the results of an empirical assessment of fifth-year ATC students' psychological readiness according to motivational, cognitive, emotional and volitional criteria.

Professional training of ATM specialists is a multidimensional process which includes not only acquiring theoretical and practical competence, but also developing personal characteristics of a professional depending on the requirements of the sphere. ATC professional requirements are high and rigid as ATC activity is viewed as one of the key factors in air safety.

It is quite obvious that professional ATC training quality support is possible only under the conditions of constant improvement of training process, its forms and methods in harmony with the dynamics of aviation development tendencies.

To begin with, ATM specialist vocational fitness among others embraces psychophysiological and personal aspects. The psychophysiological aspect of ATC activity plays a great role at occupational selection stage. However, it is no less important at the stage of identifying candidate's potential capabilities and at the stage of successful acquiring of professional skills. We earlier talked about the basic criteria of psychophysiological aspect of primary occupational selection and stated the principles of its implementation[3]. Nevertheless, the psychophysiological fitness is a necessary yet insufficient condition of high professional reliability of ATC. Readiness to perform in special conditions requires personal professional competence. In the given article we will discuss personal aspects of vocational fitness of ATM specialists.

One of the major criteria of professional ATC training quality is the degree of young ATC's psychological readiness to perform well. In fact, psychological readiness to work under pressure is regarded as an active state of the body and individual which reflects possible requirements of stressful situations and acts as a controller of appropriate behavior and contributes to promotion of effective activity under unexpected conditions and to appearance of stress-reactions[2].

At the same time, the skills and knowledge acquired during training is only an important part of such readiness. Psychological readiness to professional activity is triggered by qualitative change of all structural aspects of personality. Personal factor of professional readiness plays a vital role in professions which require working under special conditions. That is why provision of ATC students' psychological readiness for professional activity, determining the criteria of evaluation and methods of diagnostics is of the utmost importance.

To determine the level of psychological readiness to professional activity of fifth-year ATC students, the Chair of Aviation Psychology of the National Aviation University conducted a survey as a part of program the aim of which is to provide psychological support of ATM specialist professional training.

Personality model of psychological readiness for professional activity, developed by M.Dyachenko and L.Kandybovych[1], served as the basis for this research. The state of psychological readiness for professional activity in the framework of this theory is viewed as a complicated task-oriented personality manifestation of dynamic structure. It includes the following components:

- motivational (need to complete the task successfully, interest to the activity, striving for achieving success and raising professional level by way of getting new knowledge);
- cognitive (understanding of duties and tasks, and their significance, knowledge of means of achieving goals, awareness of possible change in the circumstances, skills, knowledge and expertise, experience);
- emotional (feeling of responsibility, confidence in success, inspiration, satisfaction from professional activity fulfillment);
- volitional (ability at self-governance and concentration, concentration on the task,

resoluteness, overcoming of fear and hesitation).

Formation of all these components determines psychological readiness for professional ATC activity.

The aim of our research was to assess the degree of formation of each of the above components in fifth-year ATC students. The research presupposed analysis of correspondence between students' subjective assessment of their readiness for professional activity (authors' questionnaire) and objective results of their readiness estimated with the help of psychodiagnostic techniques and expert judgment. Instructors and lecturers on professionally oriented courses, trainers at simulators and heads of professional practice were the experts in the experiment.

Questionnaire results showed that the students assessed their readiness for professional activity quite highly. Motivational component factor analysis showed that the students are highly interested in their profession: 93% wish to work as ATCs, 90% try to fulfill professional duties accurately, and 72% are targeted at achieving success in the sphere. It was interesting to find out that there was considerable difference in motivation factors for self-fulfillment between genders. Thus, cognitive component dominates among males. They tend to be interested in aviation and technical possibilities of the sphere, understanding thoroughly and having good skills of controlling electronic and engineering devices. Females seem to be motivated by the possibility of fulfilling themselves in the extraordinary 'male' profession and achieving considerable success. Financial motive was equally important both for males and females.

Therefore, positive professional motivation along with high level of professional aspiration create favorable conditions for motivational readiness for professional activity. Yet, it should be mentioned that only 30 % of students talked about motivation for continuous professional development after graduation and employment. Advanced training by way of self-education or additional training is not of priority to students. Such results may be a sign of excessive students' self-confidence in their abilities and lack of understanding of the dynamism of today's requirements to ATM specialists' competence. The following tendency should not be left unattended as it may lead to decrease in level of specialist's qualification correspondence to professional requirements.

Cognitive component of readiness based on professionally required knowledge, skills and expertise may be divided into theoretical and practical. In fact, the level of personal theoretical training was assessed by the students as high (87%) and above average (13%). According to expert assessment, 40% of students have high level of theoretical training, 43% were referred to a group of students having the knowledge above average, and 17% as average.

Indicators of subjective assessment of practical readiness level are as following: 57% of students rated it as high (59% of males and 41% of females), 33% as above average, 10% as average (33% of males and 67% of females). Thus, the students are more confident in their academic education than in practical one; at the same time females assess their training lower than males.

The detailed analysis of students' responses as to the level of their readiness for effective solving of professional problems revealed their confidence in actions within normative situations. The lowest erudition (in relation to other criteria) is felt by the students concerning the knowledge means and ways of professional tasks settling under extreme conditions. The students' perception of being ready to such situations is lowered.

Expert assessment of students' practical readiness for dealing with professional tasks is as follows: 33% received high score, 47% – above average, and 20% – average.

Comparing students' assessment of their readiness for professional activity according to cognitive component with the expert score, we may notice that the students evaluate their practical and theoretical knowledge higher. On the other hand, it is worth mentioning that the experts assessed professional readiness 18% higher than the students themselves. Analyzing the reasons of such discrepancy, we came to the conclusion that the majority of students have the level of personal anxiety above average. The students who have inadequately high assessment of their professional abilities have the minimal indicator of anxiety.

It should be noted that the inadequate assessment of personal readiness for activity may lead to considerable difficulty in young specialists' adaptation and negatively influence the quality of their work. The tendency to overestimate their possibilities together with low motivation to continuous improvement of professional skills, conditions the need to pay special attention to this

aspect and take it into consideration during professional training.

Emotional and volitional components of readiness for professional activity were assessed highly by students. 95% of respondents assessed their responsibility maximally, 97% expressed their love to profession, connected with experiencing positive emotions while air traffic management, and 67% showed readiness to risk. There was lower students' assessment of self-confidence, ability to self-control, readiness for making a decision in extreme situations by oneself, and the skill to preserve high efficiency for a long time and to concentrate attention on solving a difficult problem. A significant share of respondents (37%) indicated increased anxiety concerning situations they cannot control. In their opinion, these situations are triggered by imperfection of technical devices which lead to emergency condition.

Objective indicators of emotional and volitional components of the students' readiness received with the help of psychodiagnostical methods allow to name the following problematic issues. 7% of respondents have high level of anxiety, while 62% of them have minimal anxiety rate. It should be mentioned that high anxiety leads to low resistance to tense situations; however, we may suggest the students having minimally low level of anxiety might also be characterized by low level of responsibility, overestimation of their potential and underestimation of potential danger.

18% of ATC students have the level of internality below average. This data suggests that the level of students' personal readiness for professional activity under special conditions does not correspond to the requirements and their personal qualities, i.e. their objectives need adjustment. The objective data was confirmed by expert assessment: students' responsibility level was estimated as insufficient in 15%. Special attention should be paid to the fact that the students assessed their level of responsibility as maximally high or high. No student indicated the need for developing this quality.

On the basis of comparative analysis of the data concerning consistency of objective and subjective evaluation of psychological readiness for ATC students' professional activity, the next conclusions may be made:

- The students who are self-confident have low level of anxiety, high level of self-control and readiness for risk. They estimate their personal readiness for professional activity highly according to all the criteria. This high subjective assessment often runs contrary to expert and objective estimation.
- The students who assess their readiness for professional activity lower compared with objective and expert evaluation have high level of personal and situational anxiety, low readiness for risk, and low level of self-control in emotionally tense situations.
- Considerable gender difference between subjective assessment of personal readiness for professional activity was traced. Females estimate their readiness lower than males. According to psychodiagnostic results, the females have higher results concerning responsibility and are less inclined to risking. There is no significant discrepancy between training success and mastery of professional skills of males and females.

The empirical data acquired allowed to identify the major line of activities directed towards providing conditions for forming ATC students' psychological readiness for professional activity. We have also developed recommendations on content, forms and methods of such work. At the current stage, training testing aimed at development of ATC students' personal qualities central to psychological readiness for professional activity in extreme conditions has been held. The research will help the students to adequately assess their level of psychological readiness for professional activity and determine the lines of personal development necessary for increase of such readiness.

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V. Kornilov, PhD, Prof.
(National Aviation University, Ukraine)

AVIATION ACTIVITY AS THE OBJECT OF SOCIOLOGICAL SUPPORT

The article considers particular theoretical problems of sociological support for activities of aeronautical specialists.

Aviation activity (hereinafter referred to as AA) is a specific kind of practice that requires the aeronautical personnel to possess the following qualities: specific training of the proper level; readiness to cope with emergencies and unforeseen circumstances during performance of their duties that will require non-standard action from all aeronautical personnel; operative management and control etc. On the whole, the abovementioned provisions reveal the essence and the contents of the main AA phenomena which may and should appear as the most important objects for its sociological support (hereinafter referred to as SS).

The SS of AA is a complex of measures aimed to form and preserve high professional and psychological readiness in aeronautical personnel to enable them to perform their duties and create favorable conditions, in particular social and psychological conditions, for well-organized and duly performance of their professional tasks and preservation of their proper efficiency. The essential characteristics of its object is the competence of aeronautical personnel, institutions, and crews etc which suggests potential and actual capability of these specialists to achieve goals of this or another AA under any circumstances, within set terms and with required effectiveness.

After a most general consideration, it is obvious that this competence is primarily determined by the psychological capacity of aeronautical personnel, proper understanding of their goals and tasks, timely psychological training and ability to foresee probable changes in the current situation. The extent of required psychological preparedness of aeronautical personnel to performance of AA tasks can be assessed by their potential ability to perform its tasks, and in the course of performing such assessment – by their capabilities to perform the tasks they are facing in an effective and operative way, and with high quality.

The complex of material and spiritual powers, means, resources, opportunities and sources that may be used in achieving goals of professional activities is commonly characterized as its potential. It is evident that awareness and aims of aeronautical personnel does also include, as one of its substructures, a group of elements that can be defined as a certain social and psychological potential (hereinafter referred to as SPP). By its contents, it can be represented as a complex of its abilities conditioned by moral, social, and psychological peculiarities, which appear as prerequisites for performance of tasks set to the personnel. виконання поставлених задач. The most important structural components of SPP of aircraft crews and detachments are the degree of psychological training of aeronautical personnel, their professional expertise, knowledge, skills, habits and morale.

Being brought into action in the course of AA, the social and psychological abilities of its subjects are transformed into a practical social and psychological factor (hereinafter referred to as SPF) of a certain level which appears as an exteriorized, or external form of SPP. In aircraft crews and institutions, its level depends largely on the quality of their crewing level, the degree of their psychological training, professional training of aeronautical personnel etc.

The sociology of aviation recognizes SPP and SPF as the object of its research and as forms in which collective or individual consciousness express themselves; therefore the sociology should base, in addition to other matters, on the need for analysis of actual relationships into which they are involved. In accordance with the aforesaid, the abovementioned elements of prepared ness of aeronautical personnel should also be seen as specific phenomena, the adequate apprehension and evaluation of which is only possible through analysis of the system of activities that brought them forth, because they just do not exist beyond such system.

Hence, AA should be considered as the cumulative action being a synthesis of elements of

psychology of its subjects and their external, object-oriented deeds. The former and the latter, in their combination, form a certain entity – the social and psychological preparedness of aeronautical personnel. On the one hand, it indicates its sophisticated contents and the need for systemic analysis, and on the other hand, requires to research the constituent elements of this entity through the prism of the actually existing professional, moral, social and psychological mechanisms and relations.

Social and psychological preparedness is a complicated phenomenon interdependent with all aspects of activity of its subjects. Therefore we can single out the following in its contents: the complex of elements, subsystems reflecting various aspects of AA, and emphasizing its nature, character, specificity, peculiarity of organization, structure etc.

In the first place, it is the aggregate of interiorized requirements, rules, and obligations of subjects of AA that regulate or prohibit performance of certain actions. In the second place, it is a starting point which they take in making their moral choices and forming their behavior. IN the third place, it is a steady complex of existing traditions and values set in a certain interconnection and interdependence; the organization of moral values that appear as a kind of a code. In the fourth place, it is a complex of existing practical subjectively motivated dependencies and interactions between subjects and objects of AA; typical situations of choice; the composition of experience, well-established standards, stereotypes, styles and behavior models. Finally, in the fifth place, it represents the already formed and established ways for protection of the system regulating human behavior: certain kinds of appreciation, sanctions, and enforcement operations etc.

A significant role in consideration of phenomena and manifestations of preparedness of AA subjects should belong to realization of their classification and typology. In their most general form they can be performed on the basis of considering the following: the contents of AA; the nature of its subjects, the degree of development of components of their psychology, and the degree of density of communication. By the first component, the following types, kinds, or forms of social and psychological preparedness can be distinguished: “before performance of AA,” “before performance of its tasks,” “before performance of everyday duties” etc.

By analyzing the nature of AA subjects, the degree of development of components of their psychology, and the degree of density of communication the social and psychological preparedness can be classified into indirect and direct. The former includes mass-related psychological and socio-psychological phenomena existing within the following associations: society – a country’s aviation industry – kinds and types of aviation sphere – aviation establishments and formations. They operate at the level of government institutions, above-mentioned bodies at the level of this industry, at the level of public organizations, and are manifested in the practice of the specified AA subjects, and should be evaluated in accordance with the criteria and standards existing in the society.

Direct social and psychological preparedness of aeronautical personnel is formed on the basis of functioning and development of psychological phenomena that form its base, within limits of the following: primary aircraft crews, detachments – formal and informal groups inside them – individual specialists. It bases on the complex of content elements of their psychology determined by standards, value systems and other phenomena that reflect the need for coordination and regulation of joint activities.

It is only possible to consider distinguishing of ways and forms of existence of preparedness of aeronautical personnel depending on how AA requirements are presented to them, and depending on whether they have a specific or a generalized nature. There can be: adopted specific requirements as to performance of action in typical situations; interiorized standards that regulate activities in similar conditions; adopted requirements that indicate algorithms for choosing a certain line of behavior in accordance with general moral principles, values, ideals etc.

Depending on how the complex of these AA requirements is reflected in the psychology of its subjects, the following elements, ways of existence and manifestations of their preparedness can be distinguished: the degree of formation, availability of the call of duty, conscience, dignity, honor etc. They also experience certain determinant influence on the part of such phenomena as traditions, customs, ways, examples, authoritative persons, systems of values, standards, and attitudes that find

their place in aviation organizations and detachments.

A complicated issue in research of preparedness of aeronautical personnel is determining its place in the structure of their AA. Its main components should first of all include the subject, the object, as well as the subjective and objective aspects.

The subjects of AA are as already mentioned above: the society and its institutions; the aviation industry of the country; its main components, kinds and types; aviation establishments, formations, and organizations; crews, detachments, formal and informal groups inside them; individual aeronautical personnel members.

Speaking of the subjective aspect of AA we should primarily mean the psychological, social and other features inherent to its subjects. Their reflect the degree of their involvement into the processes performed and the nature of their actions, their attitude to regulated standards and values etc which are, at the same time, the complex of factors and conditions determining it. The main components of the subjective aspect of AA should be basic psychological, socio-psychological, moral, and other properties, peculiarities, features and characteristics of its subjects. It is them that form the basis of their social and psychological preparedness. The following should be primarily classified as belonging here: characteristics of temperament of aeronautical personnel; features of the complex of cognitive, emotional, and will-related psychological processes inherent to them; the degree of interiorization of cognitive basics of AA; characteristics of the already formed skills, customs, and habits; the contents of their direction, the needs, interests, goals, motives, attitudes, value systems etc inherent to them; their aptitudes and character.

All AA objects may be divided into direct and indirect. The former include all things that may be the reason for certain specific problems in their realization. They include all range of things and phenomena directly included into the field of planning, forecasting, and realization of goals and tasks. In their turn, indirect objects suggest the existing system of relations betweenteh state, the aviation industry and all of their components concerning all that requires certain regulation but presents a wider and more generalized aspect of interaction with the existing problems.

The objective aspect of AA may denote the complex of real and practical actions on the part of the state, its aviation industry, aviation establishments and organizations, and individual specialists in order to realize its goals and tasks. That is, it is a kind of “social facts.” The elements of the objective aspect should include as follows: the degree of involvement of its subjects into AA; its efficiency; the quality of performance of regulated standards, requirements, orders and instructions; the degree of their professional qualifications; the available discipline etc.

In the structure of social and psychological preparedness, we may distinguish the horizontal and vertical sections. The horizontal; substructure may be defined as interaction, interconditionality of its internal and external sides. The internal side contains the abovementioned properties, peculiarities, and features of subjects, while the external substructure is represented by the “subjectivizing” or “materializing” acts of AA. In its turn, speaking of the vertical section of the structure of preparedness of aeronautical personnel we should think of possible indices of the degree of its formation or development. For example, with such degrees, as “high,” “rather high,” “satisfactory,” “poor” etc.

Basing on the abovesaid, we should consider the main subject and main tasks of SS AA to be the study of regularities in functioning, formation, and development of SPP and SPF in preparedness of its subjects, and disclosing of objective and subjective factors that determine them.

An important stage in the study of problems of SS AA is also performance of further analytical and factor-based operationalization of the contents and structure of some of the abovementioned social and psychological phenomena, and the search for empiric indicators and indices inherent to them. For that purpose, it is necessary to perform a more detailed analysis of them, in the first place, and in the second place, to consider AA as a result and a consequence of general and specific determination. In order to do that, we need to single out more clearly the individual (personal) and socio-psychological levels of social and psychological preparedness of aeronautical personnel, as well as the ergonomic features of the environment where they have to perform their duties.

Conclusions

1. AA is a special kind of practice and requires aeronautical personnel to have a specific type of training. The SS AA is a complex of measures meant to form and preserve high professional and psychological readiness to performance of their duties, and create favorable conditions for performance of professional tasks.

2. The abovementioned elements of SPP and SPF of subjects of aviation practice as well as phenomena that affect their functioning and development are interconnected and can supplement and compensate for each other to a certain extent. As a result of the subject of SS AA, we should see the optimization of the abovementioned complexes, systemic formations of individual and collective consciousness, psychology of aviation specialists, which are, in particular, determined by the surrounding phenomena of socio-psychological, social, ergonomic environment etc.

3. Such approach allows to use, on the one hand, social and psychological abilities of aeronautical personnel and their real behavior, and on the other hand, social, psychological, and other factors, ergonomic conditions of the environment etc in the course of research and solving certain problems of SS AA.

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L. Drotianko, Dr. Sc., Full Prof.
O. Skiba, PhD, Senior lecturer
S. Ishchuk, Senior lecturer
L. Kadnikova, PhD, Assoc. Prof.

HUMAN FACTOR AS A SAFETY ELEMENT IN AVIATION

The article examines the role of psychosocial factors in ensuring the safety of aircraft and their role in training of future airmanship specialists.

Among the causes of aircraft accidents we can roughly distinguish the following main groups: the first is associated with a technique failure, the second – with the influence of environmental factors (e.g. weather conditions) and, finally, the third is caused by a human factor. Statistical data prove that the majority, approximately 70% to 80% of the total number of aircraft incidents and accidents are associated with the human factor. In addition to that besides the systemic and organizational errors of crews, which violate the rules of flight, you should also take into account some errors in the actions of ground service specialists including controllers, mechanics, designers, etc. We emphasize that some certain individuals fly planes that is why the importance of the role of human factors in performing and carrying out flights should not be overlooked. And of course we can hardly eliminate from their professional work personal life and social processes, relationships with crew members, previous experience, personal tastes and passions, and so on.

Each individual does not learn just passively the meaning of different ideas and concepts, he processes them. This content can be assimilated by him more or less completely, more or less correctly. It can manifest in his life quite differently, give to his personality a different sense, cause certain feelings and motives, or leave him indifferent, as if not touching his personality at all [13, p. 164]. These specific psychological features, which human knowledge and ideas acquire, of course affect scholarly and professional activities. That is why one of the very urgent problems of modern science appears to be the problem of human factor in technical activities and aviation in particular. Indeed, in similar situations far not every pilot is supposed to commit errors. That became the very basis for the introduction of the concept of the human role, so-called "personal factor" and its connection with aviation events, linking it with the cause of aircraft accidents and not with technical difficulties, but with the individual-psychological qualities of the crew and ground services specialists.

It should be noted that today in the scientific literature there is no single approach to understanding of the human factor. Thus, some researchers include into the understanding of a human factor some limitations of the crew and ground services specialists, attributable to specific equipment with which they interact [3, c. 11]. Others understand human factor as a set of psychological, physiological, biochemical, anthropometric and other human qualities, which are defined under the criteria of functional conformity with man and technology [10, c. 129]. Finally, in accordance with the definition adopted by the ICAO "human factor is the science about people in those circumstances in which they live and work, their interaction with machines, procedures and the surrounding circumstances, and the interaction between people" [9].

M. Polanyi was one of the first who wrote about the role of the human factor in science, noting the impact of intuition, personal and scientific skills on scientific activities, which are obtained only through the practical participation and can cause distortions and errors. Once, in particular, N. Maskelyne, the royal astronomer, fired his assistant D. Kinnebrook because he always recorded the passage of celestial bodies more than half a second later than his supervisor. N. Maskelyne did not understand that such a careful and cautious observer could allow a systematic shift over time because he used a certain method of observation. 20 years later F. Bessel eliminated that contradiction, having justified D. Kinnebrook, and initiating experimental psychology, which since that time has claimed that you can always expect these individual differences of perception

everywhere [7, p. 42]. As rightly M. Polanyi observes, such cases are quite numerous in the history of science, which are caused not only by psychophysiological characteristics of a scientist, but also by his social and psychological characteristics. Thus, scientists have spoken about the human factor and its impact on scientific and professional activity pretty long. Regarding the introduction of the concept of "human factor" and the disclosure of its content in aviation it is primarily due to the achievements that engineering and social psychology, social philosophy have brought about in the study of the nature of interaction between pilots, dispatchers, operators of technical devices, surrounding environment and other specialists of their joint activity.

If previously, the process of human interaction with an aircraft was provided by pilots with simple motor reactions, then today, as a result of permanent sophistications of aircrafts, the number of controlling and monitoring elements is dramatically increasing. A pilot has to work with a complex information system, and the role of intellectual, emotional and psychological components in his profession grows much, since man can not get rid of the limitations caused by his biological nature, psychophysiological, social and psychological characteristics.

Of all the categories of aviation specialists the greatest interest in the successful completion of a flight, of course, belongs to the flight crew because the very crew is exposed to a direct threat to life and bears moral and legal responsibility for the consequences of the flight, often radically changing their future life [6, p. 6].

Therefore when investigating the causes of an accident, now two basic approaches to the explanation of the problem have been formed. The first sees tracing faults of a crew as an ultimate phase of investigation and the crew or the pilot who made a mistake are considered guilty. The second approach is based on a systematic methodology. Under this approach a faulty action of the crew is not final but the initial point of investigation, during which the totality of relationships and interactions are revealed, out of which cause-and-effect relation of appearance, adverse development and the way out of the particular situation of flight come to light. Thus at the beginning it is assumed that the cause should be sought not so much in the crews, but in all elements of the aviation system. On the one hand within this problem there are the official representatives of civil aviation, on the other – the representatives of the crews and their advocates who are pretty consistently supported by industrial science and who strongly disagree with this assessment of the problem. Modern aviation practice is undoubtedly very rich in examples of unprofessional actions of the crew [11]. But is everything so definite here?

Some scientists propose to examine the professional reliability of a pilot in the light of an aviation system, of its every component, which has its specific features. However, they pay a marked attention to one of the most important features of the pilot's profession, namely that the pilot's activity in an assigned situation and in an emergency case of a flight according to their mechanism are two different activities. As in "... emergency situations no stereotypes, but new forms of reaction are needed" [11]. Relying on the fact that an experienced pilot will successfully cope with everything in difficult conditions of a flight appears to be less grounded.

As A. Yurevich notes, a man looks at the instruments, but sees some empirical data and a conversion of the data to another semantic system takes place. This system is formed in the observer's thinking and bears the imprint of his personality. His intrapersonal "World" incorporates a certain linguistic culture, socio-psychological features of the personality, his former experience, some peculiarities of the interaction with the social environment and many others [14, p. 23]. Thus, the results of the observation are given a status of the facts. But at the same time the scientist emphasizes that the facts are not identical to the results of the observation, but include their specific interpretation that is somewhat subjective. And, as a psychological research shows, even specially trained observers see what they expected to see. As a result the same data are seen in different ways – depending on their mode of interpretation. It happens because the development of the aeronautical engineering is accompanied by an increasing number of interpretive units, by growing dependence on personal characteristics of the observer and the interpretative procedures carried out by him. Thus, the operation complexity of modern aircrafts requires from a human operator the availability of some certain personal and psychological characteristics, the ability to quickly process large

amounts of information, make decisions and implement them into practice in a short period of time. Therefore, it is not surprising that a complexity of research technology is tantamount to the growth of personal factors mediation.

Science builds models that simulate the behaviour of objects and provide mathematical calculations of such conduct, implementing interpretative acts of awareness of research data and regulatory procedures for their explanation and description [5, p. 399]. Consequently, the result of the observation has little to do with photographic mapping of the observed objects, and bears the imprint of self-expression of the research subjects and is embedded in some way "... in the social mechanism that controls the interpretation of its meaning (universal dimension) and some conditions of its practical use (showing a generally valid measure)" [4, p. 157]. So under conditions of present "...being in the world of computer information space or virtual activities" [8, p. 4-5] there is a need to study the influence of "virtual reality" and "virtual communication" both on a person's behaviour and on his psycho-emotional complex. For though, the spread of innovative technologies and transmission facility, storage and processing of information do not reduce the role of personal knowledge, still they cause a qualitative transformation of "anthropological foundations of personality, his personal visual space" [8, p. 8]. Ironically, the development of technology, creation of which is based on formalized knowledge, only increases the value of personal knowledge. Personal knowledge fills gaps in objectivised knowledge, which is always insufficient for performing a complete cognitive act. Therefore, contrary to a popular belief that changes in the process of scientific cognition caused by the advent of computers and information technology makes the modern science "impersonal", the role of personality factors in it never decreases. The peculiarities of interpersonal interaction mechanisms depend on social and psychological factors implicitly present in the professional communication that are "... a tool that provides integration of individual actions in collaborative group work and communication. ... Purposeful joint activities and interpersonal communication are impossible without understanding a partner, his purposes, senses, plans and intentions" [1, p. 223-224]. Thus, in this case we can agree with L. Fleck, who notes that a well-organized team is a knowledge carrier, the volume of which outweighs capabilities of an individual [12, p. 54]. This signifies the increasing role of communication between crew members. And a communicative factor is the ability to collaborate and interact in a team, responsibility, initiative, the system of life values. All messages must be clear, understandable and unambiguous. Crew members must be on the same wave, as their interaction, intuition, ability to resolve conflict situations can save many lives. In contrast, cultural differences, language barriers, inattention, fatigue, stress, etc. can lead to fatal consequences.

Microelectronic Revolution, demonstrating the power of human intellect, changes the mechanism of interaction between humans and machines, encourages development of new forms of communication and research teams. "Regarding a computer as a technical device (artefact), which performs rather a mediate function in transferring knowledge from one person to another and acts as an original text ... forces us to focus on the personal implicit component of knowledge and also on the cultural preconditions for communication between people using computers" [2, p. 56], says I. Alekseyeva. This is, in turn, the evidence that in the era of a rapid growth and complexity of engineering the role of personal knowledge does not decrease.

This view was supported by V. Yurevich, noting that the development of technology, the latest distribution of information transmission mediums, the creation of which is based on a formalized knowledge, does not belittle the role of personal knowledge, but only increases its value because objectivised knowledge is always insufficient for a complete cognitive act. It is always constantly supplemented with subjectified personal knowledge [14, p. 29]. Although information technology qualitatively transforms the entire process of pilots' professional activity, no computer can replace humans. So we cannot deny here the role of human factors to ensure flight safety.

Conclusions

Pilot's work is associated with some considerable nervous tension and per se is a sensitive indicator of the neuro-psychological sphere. After all, first in most critical situations people have to

solve several problems simultaneously and secondly, to overcome the situation a hard time limit is given, which requires more intensive processing of information and so not everyone is capable of. Therefore, social and psychological characteristics of the crew, which include: human capabilities, level of health, performance, type of nervous system, level of social maturity, values, interests, needs, etc. are the dominant factors in cockpit failures besides the level of professional training and the volume of general and special knowledge.

Flight safety in general, as the problem of "human factor" in particular, is a system category, which cannot be resolved by partial measures at all. Therefore, by the further development of aviation technology, solving this problem they should take into account the above-mentioned factors when selecting professional specialists, and also the peculiarities of interconnection of man and technology.

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E. Slastenko, PhD, Prof.
O. Sidorkina, PhD, Assoc. Prof.
T. Poda, PhD, Assoc. Prof.
S. Iagodzinskiy, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

ROLE OF THE HUMAN KNOWLEDGE IN AIRCRAFT SAFETY IMPROVEMENT

Philosophical and ethical aspects of flight security system are taken into account in this article, the role and place of future aviation expert preparation is indicated.

Aviation is playing the important role in the system of passenger and transport delivery of the world these days. Especially attention should be paid to the increase of tourist aviatransportation, business contacts etc. Along with increased technical capabilities of flight control systems of aircraft complexity, increases the risk of emergencies that require further development of measures of aviation safety. Separately should also note the potential terrorist threat.

The inclusion of Ukraine into the global airspace (Ukraine is a member of ICAO), the approach to the introduction of "open skies" set the agenda for many diverse issues related to full integration in this space, improving the safety of air traffic. Part of the problem, in our opinion, is the socio-cultural aspect in its broadest sense.

The analysis of literature as for this question indicates as for the difference of its technical and psychological side, connected with personal aspect, social and cultural aspect is considered fragmentary, from separate issues connected with direct influence of technical issues on humanitarian ones. Scientists have identified a number of urgent problems to solve them in the near future. In particular, the issue of sustainable development of the national aviation terminology in the context of globalization [1, 2], the question of the "human factor" in aviation [2-4, 5, 7, 9, 10, 13, 14], the formation of educational environment in vocational training flight composition, psychological aviation security [2, 15] and others.

Much less attention was paid to the analysis of the total space and the role of human knowledge in the system of training of pilots (and general aviation industry workers) from the standpoint of improving the quality of aviation and safety of flights. Therefore, in this article, we attempted to identify, organize and consider the essence of socio-cultural component of safety, noting the place of human knowledge in these issues.

Safety of air transportation is one of the leading places in the degree of research attention and will be on the agenda as long as there is pilot aviation. The significance of this issue can be seen with some statistics. Yes, if in the 30th of the XX century. Because of the pilot fault there were 35-40 % of accidents and disasters, the 50-ies the figure was 55 % in the 70's - 60-65 % in 80-90 years - 70-75 % in 2000 – 92 % [15]. According to other data in aviation for decades starting with the 60-ies of XX century the share of the "human factor" of the total amount of aviation accidents is estimated by a steady increase from 40-50 % to 80-90 %, and considering flying of general aviation maintenance, air traffic management, transport infrastructure, the overall proportion of the human factor is 90 % [9, s.27]. All this indicates the increasing importance of human factors as interconnected systems professionally important qualities (neuro-emotional stability, motivation, efficiency of thinking, technical skills, etc.).. In the aviation industry the concept of "human factor" includes many items related to the behavior of a man, his capacity for work, methods of decision making, cognitive processes, correct operation of technical devices, navigation equipment, staff training improvement. Thus, that is the science of people who live and work in certain conditions of their interaction with machines, procedures and environment, as well as the interaction between people [3, p.9-10]. It's clear, avoiding of disaster in an emergency depends on the balanced and professional actions of pilots. In the study of the human factor the achievements of such disciplines as psychology, physiology, medicine, construction machinery and equipment, sociology and others are traditionally used. However, the complexity and diversity of the human factor requires a broader view of man as a social person, which includes consideration of socio-

cultural, or humanitarian knowledge (need to explore all that is disconnected set in a philosophical analysis of human interaction and technical devices in ergastic complexes [9, p.31]).

According to researchers evaluation social and cultural factors "significantly affect the allocation of population related benefits in passenger transportation" [14]. Here, except for reasons of prestige, habits, social attitudes, there is also awareness of the degree of comfort, convenience and safety of traffic. The significance of these issues in our time also increases due to increasing cross-cultural contacts, international communication, which requires a deep awareness of cultural basis and traditions of other nations.

Next, we consider these social and cultural aspects of human knowledge related to the formation of an integrated flight safety system.

Next, we consider these social and cultural aspects of human knowledge related to the formation of an integrated flight safety system.

Over the past years in the practice of flying activity, international contacts increased in this area, there appeared a need to harmonize conceptual and terminological apparatus, or a special flight terminology. Its use provides an important point of an adequate interpretation of the content of terms and concepts is of the main importance for the safety of air and ground aviation. There arise urgent "national philosophy of traditional approaches to language applied traditions and the actual state of the realized measures of aviation terminology that based on them ... try to formulate specific conclusions of the socio-cultural aspects of globalization" [1]. Namely transport language improvement of the policy can increase the competitiveness of the national civil aviation. The linguistic aspect of human factors also include lack of semantic elaboration of such categories as "complications of flight conditions," "difficult situation", "emergency situation", "catastrophic situation", "incident", etc., due to lack of axiomatic definitions of terms such basic concepts as "event", "status", "situation", "action", "error", "special situation during the flight" [9, s.29] as for aviation.

One of the most important, in our opinion, is axiological aspect associated with the practice of decision making. This is in line with student-oriented approach in the education of future pilots, which psychological and educational theory offers. The essence of the latter is that one gets not only a certain amount of knowledge, but he is included in the educational process of identity formation, gaining experience of specific personality features: self-reflection, determine the meaning, will regulation, responsibility, creativity, and others. [2, p.37].

Personal evaluation include a subjective ranking of importance, or quality of the situation. As for the decision making evaluation serves as a compass that indicates to a person the desired direction when you need to choose between alternative actions. It is important to emphasize that any decision, not only related to issues of social responsibility and ethics, is built on the foundation of a system of values.

With such concepts as "freedom", "responsibility" to a number of ethical categories is closely connected. The most important of them is the duty as the need to fulfill their moral obligations and the need to subordinate freedom more important than one’s own. Their implementation implies agreement with those requirements that are placed in the imperatives of duty. This concept is in tune with other moral and psychological mechanism - the "conscience", which operates from the middle of our soul and is an indicator of good faith performance of our duty. Thus, that is the sense of responsibility for specific duty, it is an internal self-report for the fulfillment of certain moral obligations of the individual [5, p.81, 92, 94].

Studies show that valuable orientation influences the way the decisions are made. There are many factors that complicate interpersonal and inside company communication, affect decision making. This can manifest itself in different perceptions of the serious perception of existing problems, limitations and alternatives, leading to disagreement and conflict in decision making. Therefore, an important part of education is the formation of collectivism, common values, the sense of team, which shows the social essence professional skills of pilots. Also the important issue is the humanization and humanitarization of engineering education, which contributes to general cultural development of young professionals, the formation of their creative thinking and understanding of the achievements of modern science and technology, understanding of such interconnection as "man-man" "man-nature" "man-production", "man-machine" and others. [11, p.34].

The practice of civil aviation of the last decades has shown the emergence of a new type of

conflict between the demands of management non-state air companies and with regulations airline safety. According to the analysis, the main factors that affect the possibility of pilot error actions are in addition to ergonomic features of the aircraft as social factors and their personal qualities [4, P.35]. The latter includes such elements as: general orientation of the individual through their ideals, beliefs, ideology, interests, etc., the level of training, the quality of mental processes and character. Over the recent years a trend towards a conflict has been seen as for motives in consciousness (or incompatibility) in specific contexts between the need to ensure the safety of flight and receive the benefits, cost savings, preservation of "image" and others. In this case, the direct social environment of pilot (commercial interests of the airline or structure) may be crucial in the process of acceptance of a decision during the flight mission. The conflict of motives, arising under its long-term effects can be serious negative factor that leads to psychological personality disorders, increased depressive tendencies and psychosomatic manifestations of discontent. In this situation, first of all such a quality a person, as will start to suffer, when the pilot is forced to deal with the dilemma of "safety-benefit" and refuse to perform a risky but profitable solution [4, P.35]. Therefore, new social conditions new meaning become the category of courage and civil responsibility. Not the least role is played by moral principles and ethical norms that prevail at present in society and directly or indirectly influence the formation of moral and motivation of the pilot's personality. Thus, the issue includes the integrated system and common criteria for responsible decision-making in all sectors of the aviation industry.

Thus, concepts such concepts as responsibility, obligation must serve as the main motivating function in the formation of professional skills of pilots, part of corporate ethics. Concentrated expression of the integrity of cultural and professional levels of the pilot's personality is the system of their actions during emergencies in the air. This way cosmonauts AG Coastal and V. Ponomarenko described this state, indicating the words of test-pilot: the main thing is the "ability to think rationally at the moment of danger, thinking about what is necessary to do, but not what will happen to me" [9, p.140].

The further aspect of the content of human knowledge that will contribute to the formation of professional skills of employees of aircraft is the philosophical dimension of the problem space and time. Besides it is important to get not just the general notion of time, its properties, forms, but also features its course in a specific flight operations.

Time, like space, is a necessary component of human perception, and ability to perceive objects and events in time sequence acts as an important feature of consciousness. According to one of the philosophical interpretations of time the meaning of the duration of the phenomenon of the route, changing each other, with only one dimension [12, p.53]. There are different kinds of time that of practical importance for flight safety. First, a biological time, which has typical properties such as vector function, skewness (dissymmetry) (direction from the past to the future), hidden asymmetry (indicating the form of rhythm), diversity and inequality. That's why at different ages we require various amount of time to perform the same physical activity. Circadian of biological rhythms of time is taken into account during flights through several time zones. So the experience of pilots trying not to adapt to the time of place of arrival, but keep following to the sleep of their permanent time zone. In regard to, the experience of British airlines draws attention to it, according to which during twenty-eight flying days pilot can cross no more than forty time zones without reducing the level of his performance [8, p.102-103, 112].

Another practical aspect of time related to the known phenomenon of his "compression" in emergency situations. The result of reaction of pilots to such conditions is either quick decision to the only correct solution, or paralysis of the will. Research conducted for the purpose of the subjective feeling of time delay among hang-glider pilots show that when successfully completed flight, when there were dangerous situations, time flowed longer than it was in reality. The comparison of the duration of the flight with the duration of individual minute pilot indicates the existence of two different mechanisms for extension of time - a slight increase in the duration of a minute and sharp, but short-term change in time scale. In this case, by the parallel analysis of options for dealing with a different scale of time for a person subjectively seem stretched ("berkhovskyy time" as a stream of events that are mutually disjoint). In this regard, results of studies indicate theoretical interest of perception of events someone, in particular the philosophical model A. Loginova as for two directions of person's time flow -

the real physical with the direction of movement from past to future time and mental activity of the reverse movement from the future to the past with different rate movements associated with the rate of processes in the nervous system [8, p.127, 139].

So, having considered the philosophical and ethical aspects of system safety, we can determine the place and role of human knowledge in training future specialist aviation. It's necessary to admit an important role student-oriented model of education, aimed at developing of an integrated personality of the pilot. Thus, in our opinion, more effective achievement of this objective will contribute to broad socio-cultural (general humanitarian) approach to the specific content knowledge with professional issues as for importance of aviation safety. This content should include knowledge of the field of ethics, moral consciousness, deep examination of number of categories of philosophy, as well as perform cultural education that will profit to the acquisition of necessary skills of specific personal characteristics.

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I. Vrzhesnevski, PhD, Assoc. Prof.
N. Turchyna, PhD, Assoc. Prof.
E. Cherniaev, PhD, Prof.
(National Aviation University, Ukraine)

QUANTITATIVE AND QUALITATIVE CHARACTERISTICS OF PHYSICAL EXERTION AND ITS INFLUENCE ON THE FUNCTIONAL CONDITION OF FUTURE AVIATION SPECIALISTS

This article is about physical exertion and its influence on the functional state of human body. Much attention is paid to the influence peculiarities of physical exertion with different quantitative and qualitative characteristics on the functional condition of the students. This article can be useful for everybody who is interested in physical training of students in Ukraine.

Physical training of students in Ukraine includes two approaches: health-improving approach, i.e. health physical training and athletic approach − training in sports groups and university teams of different kinds of sports. As a rule students training in teams are distinguished by intensity of motion activities depending on the physical training cause chosen by students they undergo.

Physical exertion is defined by the formation and development of fatigue processes and restoration of human body. Depending on the fatigue development level and further restoration of physical efficiency it is accepted to distinguish the following physical exertion: low, medium, high and critical.

The main task of our investigation is to find out the influence of physical exertion with different quantitative and qualitative characteristics on the functional condition of the students of our university.

The results of investigation were intended to be the base of development of practical recommendations on organization of different forms of self-training for students with the help of different sports facilities.

Thus, the object of our investigation is a pedagogical system of physical education and sports training of future aviation specialists during their trainings and self-trainings.

While conducting the investigation the following methods of data gaining were used:

1. theoretical analysis and generalization of literary sources and normative documents;
2. survey on the subject of investigation;
3. testing of motion activities of students;
4. forming natural pedagogical experiment.
5. statistical data processing and analysis of finding.

114 male and 108 female second-year students (specialities: aeronautics, avionics, aerospace control system, aircraft) attending health-improving course of National aviation university took part in the pedagogical testing.

148 students attending athletic course underwent testing (basketball – 22 students, football – 20 students, strenflex – 8 male and 14 female students, step aerobics – 39 female students, funk aerobics – 14 female students, athletics – 13 students).

The process of organization and realization of physical education during their training and self-training is a basis for forming experiment.

Physical exertion undergone by the students of test group and experimental groups was different in terms of quantity and quality. We mean the number of physical education classes per week and volume and intensity of physical exertion.

Basic data for obtaining objective evidence are the following:

1. Recording of physical condition of the students who attend physical training classes once a week with low physical exertion. These students (222 p.) were included into the test group of natural experiment.

2. Recording of physical condition of the students who attend classes of sportsmanship development three times a week (110 p.) with medium physical exertion. These students were included into the experimental group №1.

3. Recording of physical condition of the students who are trained in NAU teams 4-5 times a week with medium and high physical exertion (148 p.). These students were included into the experimental group № 2.

Intensity of physical exertion (low, medium and high) has been determined in accordance with time characteristic of restoration process in a human body generally adopted in the theory of sports training.

Thus, after undergoing low physical exertion a human body needs from several minutes to several hours to be restored.

After undergoing medium physical exertion a human body is restored within 24 hours.

After undergoing high physical exertion a human body is restored within 2-3 days (for example, after running triathlon distance).

The following results were recorded in the process of investigation of physical condition of students of test group and experimental groups:

1. Speed and high-speed stamina (running 100 m);
2. Speed and dexterity (shuttle running 4x9 m);
3. Aerobic stamina (running 3000 m – men, 2000 m – women);
4. Muscle endurance of arms (chin-ups – men, press-ups – women);
5. Muscle endurance of body (raising legs hanging on the horizontal bar – men, raising body from the lying position on the back – women);
6. Explosive force of leg muscles (long standing jumps).

Recording of the above-named test results in the beginning (October 2010) and at the end (May 2011) of academic year allowed us to conduct comparative analysis.

On the base of analysis and comparison of finding we have come to the following conclusions:

1. The students who attend athletic training course need 4-5 training classes per week using scientifically grounded correlation of different kinds of physical exertion.
2. The students who attend health-improving training course need 4-5 training classes per week that require mainly medium physical exertion.
3. The students who attend health-improving training course once a week with low physical exertion can not show satisfactory level of physical condition.
4. According to the survey 81,3 % think that physical training classes once a week is not enough and propose to increase the number of classes to 2-3 per week.
5. 100% of students consider physical exertion at the PT classes to be low and easy.
6. 66,7% of students of special health group consider it reasonable to arrange 2-4 PT classes per week with preventive and therapeutic purposes.

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V. Fotyniuk, Senior lecturer
(National Aviation University, Ukraine)

TECHNIQUE OF PROFESSIONAL - APPLIED PHYSICAL TRAINING OF ENGINEER – MECHANIC STUDENTS BY PROFESSION

The article proves the basic elements of technique of professional - applied physical training of aircraft maintenance engineers. The peculiarities of their future professional activity have been taken into consideration.

Problem. The success of future specialists' preparation for their professional activity depends on the effectiveness of teaching methods. Physical training of students is an important component of the process of mastering their profession. Leaders and teachers of physical education should realize clearly direction and objectives of physical education as a compulsory discipline in technical universities while organizing the learning process. It is an integral part of the overall system of training and education. It should promote the general and special personality development, including development of physical qualities of students of aviation industry in accordance with the requirements of their future profession.

The methods of organizing and conducting studies that are used with different level of intensity according to physical activity, defined by the students' age and gender characteristics with appropriate change of load and rest, which provides optimal physiological effect and corresponds to different levels and depth of reduction processes, play the leading role in ensuring the effectiveness of physical development of future aviation engineers.

Analysis of recent research. Domestic and foreign scholars (D. Lavrinenko, 2003; M. Arzamastseva, 2004, T. Popov, 2004; Yu Yevseyev, 2005; S. Halaydzhi, 2005; T. Tarasenya, 2008; R. Rajewski, 2010) emphasize the fact that the traditional system of physical education is unable to effectively influence the development of individual physical abilities, professional formation of professional-applied motor students' skills.

At the same time increasing of the efficiency of production processes in various spheres of economic activity causes the reorganization of physical education and a significant strengthening of its constituent professional - applied physical training as the basis for successful mastering of operational processes. This idea was discussed by many researchers: A. Dyachenko, 1997; O. Karavashkina, 2000 N. Zavydivska, 2002; V. Yezhkov, 2003; V. Filinkov, 2003; O. Kamayev, V. Artem'yev, 2005; R. Rymyk, 2006; A.Tserkovna, 2007; N. Boreyko, 2008; I. Bondarenko, 2009; W. Squash, S. Poliyevskyy, R. Rajewski, 201). This task is closely related to solving many problems of applied nature to improve the management, organization and provision of adequate physical fitness of young people at the present stage of development of various industries. However, analysis of practice shows that there are some problems in the training of aircraft maintenance engineers. This suggests that modern teaching methods which are used in the educational process do not solve the existing problems of preparation for professional activity.

Purpose of this paper is to study methods of professional - applied physical training of students by profession "aircraft maintenance engineers".

The main material research. Organization of educational process of any discipline of pedagogical system of training system in universities is realized by the usage of different teaching methods, the choice of which is due to didactic aim, features of the objects of study, profession's peculiarities, that students learn. In order to solve the tasks of their professional-applied physical training we use general (applicable in all cases of training and education) and specific (characteristic only for the process of physical education) groups of methods.

The specific application of general methods depends on the content of teaching material, teaching objectives, functional readiness of aircraft maintenance engineers, their age and so on. Verbal method is widely used in the system of their physical training. In the didactic process, it is

realized with the help of the following methods:

- knowledge transfer (telling, explanation);
- control by the people who study (order, command);
- assessment of people's activity who are involved in physical education (comments, praise).

Along with the verbal methods, methods of visual impact are also efficient. They contribute to:

- Visual (control and evaluation of spatial characteristics of movement)
- Auditory (forming ability to assess temporal characteristics of motion, motor action);
- Motor perception of students performed tasks.

As it has already been mentioned, the students' physical training requires the usage of specific methods for discipline ,,Physical training ". Our specific methods of professional - applied physical training of students - future aircraft maintenance engineers are: the method is strictly regulated exercise, competitive method, ideomotornoho impact method psyhorehulyuyuchoho influence.

Peculiarity of the method of strictly regulated exercise is in the selectivity of training effects on motor and personal student's skills; in the use of a wide range of exercises in severe dose of exercise, change in intensity, duration, alternating intervals of rest and muscular work capacity, which requires usage of approaches of partial methods:

- Method of forming of motor skills by intense impact was used for improving motor activities to develop motor skills and habits;
- A method of holistic exercises has been used throughout the process of professional - applied physical training;
- Method of separately - constructive exercises is used at the stage of the preliminary study of motor actions.

Formation of physically valuable personality of future engineers of aviation industry requires not only the formation of appropriate skills and experience. The structure of the individual inclures physical qualities. Their formation is realized frontal, so? It is pedagogically expedient to use this method in the organization of work with students in the form of selective and complex effects. In addition to these, performance was characterized using circular method. This method of generalized effects in the form of continuous and interval exercise in circular training. Circular training is a major form of physical education.

Competitive method is also efficient method of professional - applied physical training of students. Its essence is to compare the forces in an orderly competition. Factor of competition during the competition, and the terms of their organization and create a special emotional and physiological background that e strengthen effect of exercise and helps to maximize the manifestation of functional capacity of the organism. During the competition the moments of psychological tension are especially expressed. This method we used to form physical, volitional, moral qualities, improve skills and ability to efficiently use them in the difficult conditions of the aircraft maintenance engineers' activity. The peculiarity of its use comparing with other methods of physical education is that it allows you to promote the highest requirements to the functional capacity of the organism and to encourage their greatest development. Special importance has competitive method of forming personal qualities of future engineers. In particular, strong - willed properties (tenacity, initiative, determination, perseverance, ability to overcome difficulties, self and others.).

In terms of professional - applied physical training of future aircraft maintenance engineers pedagogically sound is the use of the playing method. A distinctive feature of the game method - a subordination of motor actions to the plot, when a variety of conditions of manifestation of physical qualities and coordination capabilities are created This method also provides an extensive students' self-action, high demands for their initiative, resourcefulness, agility. Game method provides students with space for creative expression of motor tasks, and the constant and sudden change of situation during the game requires to solve these problems in short time and with full mobilization of motor abilities. Modeling of strained interpersonal and intergroup relations, increased

emotionality, game conflicts create some emotional tension and promote the identification of ethical personality traits.

The system of methods also includes a method of ideomotornoho influence. It helps to create a kinesthetic sensations and increase functional activity of organs and systems of the human body in an imaginary reproduction of muscular tension, relaxation. The basis of ideomotornoyi exercise are visual and kinesthetic mental repetitions of real movements, which help to learn the technical options of movements [1, p. 79].

In terms of forming experiment mental self-regulation method was of great importance because it provided psyhorehulyuyuchoho influence,. Psychic self-regulation means different ways to influence their own situation by using words and mental images [2, p. 31]. The development of progressive relaxation - an arbitrary mental relaxation is especially significant for future aircraft maintenance engineers because their professional activity is connected with a permanent high psychophysiological stress.

The techniques of professional - applied physical training also include non-conventional methods of exercise: stretching, Callanetics. Their application focuses students on elaboration of imaginary movements and postures, which is particularly important for training aviation engineers,who has to walk and work a lot outdoor in various weather conditions. Their activity is happening at an altitude of 15 m, in a limited area supports (ladders). Working postures monotonous and uncomfortable (sitting, squatting, in a bent position with raised arms, etc..) Associated with prolonged static tension. The working conditions of these profession require extensive diverse physical fitness, strength of major muscle groups, endurance, particularly special, allowing for a long time to perform a specific job, agility and flexibility for free movement of planes on the aircraft and the possibility to reach inaccessible places [3].

The methods are the components of the structure of professionally-applied physical training of students of aviation higher educational establishments. Forming this structure we must take into consideration:

a) the adequacy of students;

b) the orientation at professional content of the educational process and feature students' future profession and their impact on health and prevention of negative factors of students and professionals in the aviation industry;

c) compliance with the objective possibilities of students to be involved into physical activity according to the offered load.

Conclusion. Considered above technique of professional-applied physical training of future aircraft maintenance engineers was oriented at the development and further improvement of psychological, physical properties, motor skills, ensuring mastery of the profession, as well as mastery of knowledge and skills regarding the use of physical - health focus for the prevention of occupational diseases and negative inputs. This technique involves the implementation of need - motivation and individual - personal benefits including social demand and functionally trained engineering profile, based on an active future professional activity.

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T. Mukovoz, Senior lecturer
V. Kornilov, PhD, Prof.
(National Aviation University, Ukraine)

AVIATION AND SOCIOLOGY: PROBLEMS AND PROSPECTS OF INTERACTION. PROVISION OF SOCIOLOGICAL STUDIES AS THE TECHNOLOGY OF AVIATION ACTIVITY OPTIMIZATION

The article describes possible ways of cooperation between the aviation area and sociology, prospects of sociological studies, and application of their results aimed at improvement of aviation specialists' activity.

Every day lots of flights are made all over the world, and hundreds of planes take off and land in different corners of our planet. Thousands of people travel by air and make flights at long distances.

Every day thousands sociologists work with respondents and analyze the obtained information in the laboratories in order to determine the main trends in the society, and to forecast and to prevent the development of negative processes. Many scientists work to improve efficiency of recommendations in order to decrease the influence of the existing negative factors trying to help the society cope with the problems it faces.

What is in common between these functions of the society which seem to be as far apart as the poles? Can they join their efforts to work more efficiently to ensure well-being of people? As we can see, what they have in common is the cooperation with the people and for the people. Integration and interaction of these two important fields in Ukraine is quite possible, and in the society that makes each of us live under the conditions of constant changes it can be even required.

We can single out several areas where aviation and sociology can effectively cooperate with each other.

There is no doubt that due to significant changes both in the society and in the air fleet itself, it is necessary to have reliable information concerning everything that happens in the aviation. That's why it becomes necessary to unite sociological studies with the needs of the aviation activity and tasks on its development and sociological support of the processes arising in the aviation area. Such cooperation will favor taking adequate solutions on development of the area being investigated and forecasting certain trends, and it will allow to provide timely answers to the challenge of time and pursue a preemptive tactic. This cooperation will enrich the sociology as a science as well, specifically the aviation area sociology.

The aviation field is a social institution which is a true and live reflection of the society that gave rise to it. That's why it is important to investigate this area of the human activity development in view of demographic, political, and moral factors, and this connection is undoubtedly close. Investigation of aviation stratification can be extremely important: appearance or breakup of such layers, starting with the level of support personnel and ending with the level of administrative staff machinery, the main criteria and driving forces of their formation. We cannot but mention the intellectual culture of the aviation area: folklore, songs, professional slang, traditions, beliefs, images of its workers in the official ideology, art, public opinion; as well as the material culture: educational establishments, clubs, groups, technical equipment, uniform. As far as the social interaction is specific between the aviation area workers, no doubt that it is necessary to investigate relationships, the systems of penalties and awards, education peculiarities, as well as gender problems which are especially critical today due to the fact that nowadays women embrace professions in the aviation area. All these elements are connected quite closely with each other, and they make the aviation special comparing with other institutions.

There is no doubt that the aviation first of all consists not of technical equipment, but of people that create, test, and operate it. So, the aviation is a group of people not only as a self-

sufficient organization, but also as a guarantor of flight safety. Everything starts with the personnel preparation, which is partially done by our university as well. In this area, the sociology can offer its services paying attention to individual socialization in the work collective as a bearer of some "aviation" culture, as a factor forming a specific culture of trust which is especially important in the aviation area (an employee cannot perform some bad deed not because of fear of penalty, but because it just cannot permit itself to do it). This level of culture and moral responsibility should be achieved by each worker of the aviation area, from top executives to technical staff.

The analysis of culture of aviation organizations via the analysis of the system of values of its workers will help to determine the causes of the nature of development of particular processes in the organization. Value orientations are value and moral components of the specialist organizational culture. In this area, the problem of consistency of employees' values becomes particularly topical, both vertically and horizontally. That's why a key to successful subject socialization is a considered personnel policy of the management and prior testing of social-psychological features and professional skills and expertise of a worker, discovery of subconscious desires and motives of individuals.

As far as the aviation organizations activity is performed under the conditions of the environment which is constantly and rapidly changing and makes the industry itself change, it becomes necessary to investigate adaptation of professional activity subjects to new social and economic conditions and to increase stress loads connected with it.

Within the context of socialization of the aviation organizations subjects, special attention should be paid to investigation of continuity of generations, as far as the development of professional qualities is closely connected with the age factor, as there are two subcultures in the organization – bearers of one subculture belong to a new generation, and bearers of the other are representatives of an older generation.

It should be noted that according to some observations a significant part of the young generation in the aviation are the children of former aviators or military men – this is one more area for investigation of continuity of generations, impact of family socialization and experience on the choice of a future profession. The investigation should also be directed at preservation and making it impossible to lose experience of generations, connection of quality of performing of professional duties with the gained experience inherited from others and its integral connection with innovative achievements of the youth in the aviation professional activity. Will the modern youth be able to cultivate the same love to aviation as their parents cultivated in them? Shouldn't we pursue a preemptive tactic and do our best for a plane to take off and fly safely thanks to competent workers not only tomorrow, but also the day after tomorrow?

Sociology can also offer its services in flight safety provision aimed at the increase of the general level of air flight safety performing monitoring of plane crashes and not ignoring the problem of generational change of specialists. It will allow to forecast and to prevent possible negative factors before something fatal happens. It can also include such aspect as the influence of post-Soviet and Slavic mentality on decision-making in emergency situations when a crew faces a dilemma of hazard to life and performing the task, where the human factor should work in the opposite direction in order to take a decision to save the lives based on knowledge and skills, in violation of duties or a traditional "hit-or-miss" fashion.

Sociologists can also offer interaction in the system of flight safety control by means of constant monitoring of compliance with the requirements of the aviation legislation of Ukraine and international standards in the area of flight safety, inspections and monitoring of flight safety in performing of the main production functions of airlines, airports, and maintenance organizations.

In our opinion, it is especially important now, at the stage of adoption of international standards of flight safety. Though international standards allow 1 emergency per 10 million flights, the human factor remains determinant, that is how these standards are implemented at the national level, how easy or difficult they "get accustomed" to the mentality of the Ukrainian aviation, how interiorized they become, whether they can reach the object of desires, to what extent through the adopted standards not only international expectations, but also national interests are justified, and

what can be done in case of complicated perception of the international standards at the national level.

Taking into account all the above mentioned, sociology is ready to develop and provide the relevant means for optimization of activity in the aviation area. Technologies of sociological provision of the aviation activity should become both the result of the scientific analysis and the generalization of experience already gained. It should be mentioned that they can be created by means of dismemberment of the process of settlement of the aviation activity problems and the aggregate of the interconnected procedures, operations, means, upon their further integration to a single system.

It can be safely said that the sociological provision of the aviation area is the aggregate of constituents which can be divided into three components: theoretical, procedural, and organizational (practical). The theoretical component of the sociological provision is based on certain methodological, theoretical principles, as well as knowledge – it constitutes the foundation for investigation of its characteristics. It includes determination of peculiarities and conditions of the efficient aviation activity in performing of certain tasks. The procedural component contains methodological questions of determination of trends and regularities of functioning and development of the aviation practice components, development and experimental check of methods (tools). The main point of the organizational (practical) component lies in substantiation and creation of the foundation for more optimum structure of it, in diagnostics of the state and forecasting of development of social problems in the course of aviation activity, planning and management of activity of sociological provision institutions.

The process of development of theoretical foundations for the sociological provision of aviation activity has shown that it should be performed in compliance with certain fundamental principles, such as complexity, priority, comprehensiveness, and sufficiency of the sociological provision measures.

At the strategic level of problem solving, the tasks of creation of necessary prerequisites for the sociological provision of aviation activity should be mainly solved. And for this purpose, the bodies of state and departmental management of all levels should be involved. It will require preliminary development of the foundations determining the role and responsibility of all officials, special authorities that can coordinate the sociological provision procedure.

Conclusions

Therefore, social technologies unite the following elements: particular theories and concepts which reflect regularities of operation and development of target objects, that is object and matter of impact, algorithm of application, technological ways and means of optimization of the existing conditions. The sociological provision system for the aviation area can be created in the result of implementation of a series of priority formation actions: 1) technical, personnel, legal, economical, and other principles; 2) planning, restructuring, and integration with the existing formations; 3) structural reorganization; 4) optimization of the number, structure, and ensuring of efficient use of the available potential.

It is clear that for close and efficient cooperation of sociology and aviation and for optimization of the aviation activity, high-level professionalism of sociologists is required in order not to make piles of different programs and developments, and on the part of aviation it is expected that it will be ready to cooperate with sociologists and realize the necessity and practical usefulness of such cooperation. Moreover, it is expected that it will not take original and advanced theoretical answers of sociologists to the raised questions only as the result of academic work.

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O. Petrenko, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

HUMAN ENGINEERING ASPECTS OF TRANSFORMING AIRCREW PERFORMANCE PROCEDURES IN VIEW OF INFORMATION TECHNOLOGY EXPANSION

The paper researches connections between human factor and present-day trends in the development of aircraft technology. The author highlights the necessity to match current operation procedures to technological properties of modern aircraft, offers some human engineering suggestions to prevent transfer of old skills and conservative mode of professional thinking to the modern aircraft cockpit and considers some approaches to building adaptive information patterns.

Expectations connected with enhancement of aircraft equipment, above all through implementation of up-to-date control systems, such as IFCS (Intelligent Flight Control System), have obviously come into conflict with certain human factor problems. According to unyielding statistics, human factor today is the top issue among other aspects of aviation safety. International aviation specialists are paying close attention to various manifestations of the human factor to offer solutions to existing flight safety problems [1]. However, this does not eliminate the problem – in contrast to other safety issues, situation with the human factor does not show desirable positive dynamics.

There are several causes behind such state of things.

On the one hand, the decreasing rate of aircraft equipment failures, grounded on the growing reliability of modern aircraft, is accompanied by the increase in the relative share of negative occurrences involving human factor. If we look at the situation from this perspective, the human factor issue seems to be somewhat exaggerated.

However, if we look at other causes contributing to the problem, we will see that reasons for concern are quite serious.

Firstly, working with highly computerized state-of-the-art equipment puts additional psychological stress on a person, inevitably raising the risk of erroneous actions. This fact motivates aircraft engineers to seek solutions to problems caused by automation in further, more advanced, automation, thus launching the process of search for and implementation of innovative engineering solutions and new personnel recruitment and training practices. So, trying to solve a problem resulting from psychological consequences of human interaction with highly-automated systems by introducing systems with even higher level of automation creates a vicious circle.

Secondly, we believe that the existing situation is connected with the fact that modern air transport is involved in the permanent process of global transformation fuelled by the necessity to catch up with the new faculties and properties of enhanced technology, which presents a specific source of difficulties for personnel, urging them to transform their familiar work patterns and modes. In our opinion, here lies one of the most serious systemic challenges to flight safety today.

Practical experience shows that creation of new and even revolutionary types of equipment, with due regard for theoretical and technological complexity of the process, is nevertheless much easier than updating operation procedures and practices so that they can match the new properties of this equipment.

Development of equipment steadily outpaces the process of mastering its operation possibilities by users. Even if it were possible to immediately detect and correctly comprehend operation problems, rank-and-file personnel would never be able to adjust their behaviour patterns at once. Normally, fundamental transformation of commonly used performance procedures means handling a complex number of issues.

So, there are all grounds to assume that the ongoing enhancement of aircraft equipment, in particular through increasing implementation of IT innovations, is in a sense pushing modern aviation to a trap. To avoid it, aircraft engineers and operators should correlate their visions to

combine them in an adequate integrated flight safety mentality. In our opinion, this integrated mentality can be grounded on the idea of continuous adaptation of technological systems and algorithms to human abilities in concrete working conditions.

Adjusting people to performing work of such complexity as that of a flight crew member and building corresponding professional skills are both long and subtle processes. Personnel retraining necessitated by new types of equipment involves readjustment of previously acquired skills. Things might be much simpler if we talked about separate working skills, like motor skills needed to operate controls, instrument reading skills, performing some conventional procedures of aircrew cooperation etc. However, what we are talking about is the ability to think differently, to see differently, to feel differently, to prioritize differently, to react differently – not using another way or method, but doing these things from a different standpoint.

When LCD screens with digital instrument displays (so called glass cockpits) were introduced, pilots wanted the screens to keep the images of familiar gauges. That was a tribute to old working habits, which were gradually overcome in favour of new IT patterns. It is much harder to convince a captain or a pilot with experience formed over decades of operating old generations of aircraft that they have to give up their "good old" professional ways of thinking.

The task is to make sure that not only old professional skills, but also the old way of professional thinking will not find their way to the new working environment. This task can be accomplished through a set of measures.

Regulation of new types of activity and a corresponding system of retraining can not fully solve the problem as long as there remains the possibility of working using old habits. Practical experience shows that people can neglect established rules and regulations. Transformation of skill psychological structure is a complex and controversial process. Under stressful working conditions operators use all available opportunities to minimize individual psychophysiological losses (psychophysiological performance cost), and tend to do it by reverting spontaneously to skills and habits acquired in the past. Regulations can also be neglected due to sociocultural factors, influence of stereotypes, psychological atmosphere etc.

One of the fundamental approaches to solving the problem consists in designing such innovative aircraft equipment that makes deviation from established operating procedures either impossible or at least inconvenient. This can be achieved by a special arrangement of working space, equipping workplaces according to the nature of personnel's work and established task-performing procedures, by introduction of new information patterns, use of certain limiting devices etc.

An operator's work can be viewed as a sequence of separate actions aimed at perception of the current situation, processing of the information and corresponding response. Each action is a function of a certain number of changing situation parameters, some of which are hard to formalize:

$$d_i = f(d_{i-1}, A_1, A_2, \ldots, A_m) \tag{1}$$

The matter is complicated by the fact that parameters of the situation must include its whole prior development and peculiarities of the person's response to it. In real situations, the sequence of actions can not be unambiguously prognosticated in advance, so plans of further actions are constantly made up or revised as the situation progresses, in keeping with how circumstances are seen and the needed result pattern is understood at each moment. Existence of alternatives and the necessity of choice make the situation even more challenging.

A working process comprising a sequence of actions requires that personnel should possess professional competencies and mental processes indexes which can be presented as an array:

$$\mathbf{P} \equiv \begin{pmatrix} p_{1,1} & p_{1,2} & \cdots & p_{1,n} \\ p_{2,1} & p_{2,2} & \cdots & p_{2,n} \\ \cdots & \cdots & \cdots & \cdots \\ p_{m,1} & p_{m,2} & \cdots & p_{m,n} \end{pmatrix} \equiv [p_{ik}] \tag{2}$$

Each line in the matrix represents a list of requirements to current individual properties while performing each single operation and can be regarded as a separate array $[p_k]$ (k=1, 2, …, n).

Certain elements of various lines of **P** matrix can be identical by index type, at the same time varying in their value. Needless to say, in case of indexes being identical by their type, the normative index for the given activity type will be the one with the highest value.

The difficulty lies in the fact that in most cases each element p_{ik} is a variable with a complex determination of the current value.

As a person can be simultaneously involved in a number of algorithmized processes, there arises the question of how a person's ability to perform their functions with an acceptable degree of reliability can be determined. It is well-known that spike loads dramatically increase the risk of people's going back to their old working habits acquired at early stages of their professional career.

Simultaneous realization of a big number of requirements p_{ik} is connected with the increasing risk of performance failure, so design of technological systems and their operation procedures must provide for prevention of such situations. It may seem that automation as a means of making human job easier provides the necessary protection. However, it is not so.

Automation makes people's job easier by removing the necessity for a person to directly participate in certain controlling circuits. At the same time, human mind concentrates on action aims, conditions in which actions are realized and their results. The increasing significance is attached to general skills which can supply a range of solutions to achieve goals. As it is, general mental load even increases.

As regards the effector component of human activity, the use of highly automated fly-by-wire controls offers an effective continuous protection from violation of operating limitations. It is much harder to organize the process of information perception and processing.

The information pattern used by an operator on the working place is in a sense a compromise solution. Priority level of information signals varies depending on the current situation, so that some parts of the given information at a certain moment may appear excessive and some parts of the excessive information may appear harmful in terms of human capacities.

In view of this, we think it expedient to introduce *adaptive information patterns* as a means to optimize the process of information perception and processing.

In cases, when at a certain moment there forms a complex of algorithmized processes of aircraft handling, it becomes vital to solve the task of defining priorities and limitations in providing the crew with information. Firstly, it is necessary to take into account priorities in aircraft handing depending on the concrete flight situation. Secondly, it is necessary to consider human capacities as regards distributing personal resources among certain actions involved in reading and processing of information. In so doing, amounts of information can be temporarily restricted and at each moment optimal information display formats can be chosen.

Complexity level of a person's perception of the current information amount can be estimated with the help of the complexity index which we view as a function with a certain number of variables characterizing mental processes of information perception and processing at a given moment of a person's performance:

$$S = f(p_{ik},\ldots,p_{mn}) \tag{3}$$

It is important to emphasize that the formula shows dependence of the complexity index on a *concrete totality* of variables which must be viewed integrally.

Description of corresponding dependencies requires empirical research. To this end, we have created a testing facility which can simulate joint work of two operators, each simultaneously involved in different control circuits and processing information of various modality, performing coupled different-purpose tasks in the situation of ongoing communication with the partner.

Results of our empirical research conducted while testing this facility make it possible to assume that a certain typology of operators can be built according to the level of operators' individual performance in perception and processing of information of various amounts and content. In particular, such typology can be based on individual profiles of psychic asymmetry. With adaptive information patterns created, knowledge of operators' typological peculiarities will make it possible to provide customized adjustment of aircraft information display systems to match personal characteristics of specific operators.

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N. Pobirchenko, Dr. Sc., Full Prof.
I. Tsybulko, Postgraduate student
(National Aviation University, Ukraine)

PSYCHOLOGICAL FACTOR OF AVIATION SAFETY IN PROFESSIONAL REFLECTION

The article theoretically based on phenomenology of developing students' professional reflection. Development of professional reflection is determined by the integrated organization of professional training subject's knowledge about himself and people. Key words: human factor, professional reflection, aviation security strategy, professional and reflexive competence.

Обставини сучасного життя сприяють підвищенню значення людського фактору в процесі професійної діяльності. Так як роль даного фактору у вирішенні соціальних, економічних, політичних, ідеологічних та професійних задач є високою, то більш практичного значення набуває почуття особистої відповідальності за процес і результат діяльності. Але в процесі будь-якої взаємодії, а особливо взаємодії в професійному колективі, відбувається обмін як професійною інформацією, так і особливостями настрою, почуттями, різноманітними формальними та неформальними повідомленнями, власним досвідом та цінними ідеями. Саме тому взаємодія в колективі вимагає чіткого усвідомлення професіоналом, як процеси та результати його діяльності впливають на особистісний та груповий результат професійної діяльності [14].

В ситуаціях творчого хаосу, що переживає країна, а з нею сучасна авіація, великої актуальності набуває процес вивчення психологічних чинників формування професійної рефлексії у студентів авіаційного університету. Закони життя детермінують та стимулюють необхідність творчо навчати фактично всіх інтегрованому пізнанню себе та інших в ситуаціях ризику. Як зазначено, професійне функціонування фахівця в команді потребує якісного регулювання власних дій так і дій людей, що оточують. Несприятливі поведінкові наслідки, рольова невизначеність, конфлікти, емоційні зриви, відсутність взаєморозуміння та довіри є наслідками постійного перебування спеціаліста в умовах підвищеного професійного ризику та напруження, а також можуть стати і причинами помилкових дій, розгубленості, непрофесійності людини в процесі виконання завдання. Висока імовірність перебування спеціаліста у постійному напруженому стані та психологічному дискомфорті визначається як важлива наукова проблема у зв'язку з впливом на працездатність, продуктивність, якість і ефективність праці, фізичне та психологічне здоров'я людини. Більш того, в наш час дедалі стають актуальнішими ті професії, які безпосередньо пов'язані з постійним і неминучим ризиком, ефективним прийняттям рішення в умовах дефіциту часу та напруження, з перевантаженнями, конфліктами та з іншими негативними стресорами [12].

Ситуація ускладнюється оскільки сам вид діяльності екстремальних професій є потенційно небезпечним і тому велику роль відіграють дослідження ефективності та надійності системи «людина – техніка». В інженерній психології всі дослідження, незалежно від їх профілю, направлені на забезпечення високої точності та надійності, ефективності та якості роботи даної системи. [37].

Сучасна стратегія авіаційної безпеки пов'язана з якісним використанням не лише «зовнішніх» природних ресурсів – нафти, металу,мінералів, газу, а й «внутрішніх» - власних людських. Важко уявити інженера авіаційної сфери без психологічної професійної підготовки, уміння опановувати засоби душевного розвантаження, використовувати само тренінги та ін. Що ж стосується психологічної практики авіаційної безпеки, то організацій творчого процесу з врахуванням індивідуальних особливостей людини дуже розповсюджений приклад. Адже навіть такі параметри як швидкість реакції, сприймання, запам'ятовування - надзвичайно важливі для професійної діяльності кожного фахівця.

Десятки, якщо не сотні виняткових особливостей характеризують людину від якої залежить безпека в авіації, а саме чітке та оперативне використання прийомів і способів поведінки, передчасне врахування і передбачення змін в процесі діяльності, чіткий контроль уваги на виконанні головного виду діяльності, своєчасний контроль власних дій та реакцій на труднощі, вольові зусилля при відчутті напруження та втоми. Професійна діяльність в сфері авіації є настільки специфічною та екстремальною, що напруженість, стрес, несприятливі умови стають для людини нормою життя. Проблема впливу професійної напруги на поведінкову активність потребує дійсно глибинного теоретичного та емпіричного вивчення.

Розглянемо, які професії підлягають високим вимогам та потребують від людини особливих умінь, знань та навичків. Звичайно, особливостями льотних професій є робота, що пов'язана з небезпекою для життя, високою психологічною «ціною» діяльності, високою «вартістю» прийнятих рішень, ускладненням функцій дій спеціаліста, збільшенням темпу діяльності, монотонністю роботи при довгоочікуваних сигналів, співставленням різних за цілями дій в одній діяльності, переробкою великих об'ємів інформації, складною динамікою змін функціональних станів. Екстремальні умови діяльності дуже часто ставлять жорсткі умови перед людиною [37]. Існує низка прикладів та описів того, наскільки особливою, небезпечною та екстремальною являється взаємодія «людина-техніка». Але екстремальність умов діяльності характерна не тільки професіям космонавта, льотчика, військового оператора. Праця машиніста локомотиву, водія автотранспорту, працівників МНС також передбачають різку зміну функціональних станів від монотонності і оперативного спокою до стресових станів. Дуже часто екстремальні ситуації виникають спонтанно, мають нештатний характер і навіть при незначних помилках льотчиків, штурманів, бортінженерів, авіадиспетчерів переходять в аварійні ситуації, які несуть за собою матеріальні та людські втрати [34]. Але головною цінністю вирішення важливої для всього людства проблеми є те що реальніше вплинути на особистість фахівця, його відношення до професійної ситуації та психологічно підготовити до ефективного вирішення ситуацій ризику, аніж змінити зовнішні перешкоди.

Отже, в умовах сьогодення та вимог авіації випускник Національного авіаційного університету має бути конкурентоспроможним, висококваліфікованим, а також стресостійким як до виробничих, так і невиробничих ситуацій. Рефлексія як здатність особистості до самопізнання та самоаналізу власної психічної діяльності є одним із найважливіших показників її суб'єктності в навчально-професійній діяльності. Саме тому, здобуваючи освіту в вищому навчальному закладі, студенти мають розцінювати освітній процес не як спосіб накопичення балів, а як шанс сформувати в собі соціально-особистісні та професійні компетенції. Освіта – це процес і результат засвоєння систематизованих знань, умінь навичок, в якому головним виступає не обсяг знань, а поєднання цих компонентів з особистісними якостями, вмінням самостійно розпоряджатися набутими знаннями та використовувати їх як на практиці, так і в умовах, які не пов'язані з освітнім процесом.

Особливої чинності в процесі удосконалення задач підготовки майбутніх фахівців набуває поняття «професійна рефлексія», яке розкривається нами як сформована здатність особистості до ефективного співвідношення особистісно-професійного потенціалу з кваліфікаційними вимогами обраної професії. Саме така здатність є тим новоутворенням фахівця, що сприятиме розвитку умінь обирати продуктивні стратегії подолання труднощів діяльності в умовах ризику та відповідальності.

Розглянемо проблеми, що вирішуються динамічним навчанням професійної рефлексії в освітньому процесі:

1. Розробка освітнього процесу з гнучкими формами навчання, що спрямованні на оволодіння суб'єкта навчання когнітивно-інтегрованим пізнанням себе та інших;
2. Методична координація змісту та методів конкретних навчально-проблемних ситуацій, з метою формування навиків подолання труднощів;
3. Організовані безпосередні контакти і взаємодія усіх відповідальних осіб за реалізацію вибраного змісту і форм навчання;

4. Узагальнення та впровадження методів досягнення бажаних результатів та попередньо сформованих цілей;

5. Реалізація системно-діяльнісного підходу у вирішенні конкретної проблеми, що пов'язана з авіаційною безпекою.

Вважаємо, що предметом особливої уваги в професійному навчанні на сьогоднішній день є аналіз змісту динаміки групової рефлексії в процесі спільної діяльність індивідів, що вибрали однаковий зміст і форму навчання і спрямовують свої інтереси на розробку спільних планів та їх практичну реалізацію.

Таким чином, у розвитку професійної рефлексії головним суб'єктом вибору гнучкого змісту і форм навчання є не ізольований, а колективний суб'єкт. Саме в групах формується і реалізується потенціал професійної рефлексії, аналізуються проблеми змісту, методів міжособових взаємин в діяльності, приймаються відповідні рішення щодо об'єкту інтегрованого пізнання та стверджується роль, місце відповідальності осіб за процес діяльності і отримані результати.

Наступним постає питання про те, як в умовах колективного розвитку здійснювати індивідуальний підхід – один із найскладніших психологічних механізмів в професійній підготовці майбутнього фахівця авіаційної сфери. Адже особистісна система авіаційної діяльності інженера відрізняється невизначеністю, динамічністю, результативністю. Найчастіше робиться наголос на унікальності, неповторності, оригінальності, відповідальності та соціально-безпечної активності в поведінці при прийнятті рішення. Визнано, що особистість інженера-авіатора – це людина з яскраво вираженими самобутніми рисами характеру, пов'язаними з творчо-ризикованими видами діяльності. Дії цієї людини непередбачувані, цілеспрямовані у досягненні мети, вольові в подоланні труднощів. А найголовніше, фахівець авіаційної сфери має свої неповторні психологічні засади. Завдяки наявності власної психологічної унікальності інтегрувати результати власних спостережень за своїми діями з результати дій людей з якими він знаходиться в постійній взаємодії.

Тому в поведінкових діях інженера авіаційної сфери домінує професійна рефлексія – творча спрямованість на володіння інтегрованим пізнанням себе та інших. Поняттям «професійна рефлексія» визначено особливу якість мислення особистості, що спрацьовує в процесі розв'язування нестандартних проблем в ситуаціях ризику. Така якість мислення і є новоутворенням спеціально організованого навчання професійної діяльності. Терміном «професійна рефлексія» у даній статті розкрито особливості до опосередкованого міркування та розуміння себе як активного члена групи, суб'єкта виконуваної діяльності.

З нашої точки зору, професійна рефлексія авіатора це результат кваліфікаційно-організованого професійного навчання та усвідомленої готовності діяти за правилами авіаційної безпеки. В майбутньому описане нами новоутворення може виступити психологічним фактором, завдяки якому розвивається авіаційно-безпечна компетентність у майбутніх фахівців авіаційної сфери. Авіаційно–безпечна компетентність – одна з найскладніших компонентів структурної готовності особистості до професійної діяльності, яка виникає в результаті сформованості та практичного застосування професійної рефлексії фахівця.

Стратегія авіаційної безпеки безпосередньо пов'язана з людським фактором. Найвища мета професійної підготовки фахівців авіаційної сфери – це виховати творчу особистість, сформувати професійну рефлексію і цим вже підготувати випускника до відповідальності за власні дії і дії партнерів. Сподіваємося, що вирішенню проблеми авіаційної безпеки буде сприяти описаний нами психологічний фактор – людина з професійно-рефлексивною компетентністю.

Conclusions

The relevance and significance of human factor in aviation, analytical evaluation of research results and theoretical study of the problem push us to research psychological factors of developing professional reflection among the students of National Aviation University.

Scientific feasibility of researching professional reflection is necessary for further developing the strategy of aviation security. In this article the authors try to find the main idea which can help to make human factor more safety. Probably they succeeded. To their mind, using a specific integration-professional training at high aviation school is a key to form professional reflection among students. Such human neoplasm is the highest stage of personal development. That's why the aviator with an ability to use professional reflection will be more successful. Professional reflection reduces the number of error actions, increases the quality of action and develops safe interaction among crew. Further developing of science researching professional reflection is worth the interest and experimental verification.

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U. Koshetar, PhD, Assoc. Prof.
(National Aviation University, Ukraine)

THE ATTEMPT OF PHILOSOPHIC EVALUATION OF AVIATION SECURITY ASPECTS

The article is devoted to the analysis of the problem of suicide bombers from the point of philosophic suicidology.

The problem of security in aviation is quite vast thus we will try to consider the certain case dealing with terroristic activity of some islamic groups . The present article is dedicated to philosophic understanding of the mentioned problem and its possible coverage in mass media aiming at antiterroristic propaganda. We suggest the following approaches of shaping public opinion and attitude towards suicide bombers whose belief in Allah is declarative rather than sense of life. According to S.Zhizhek ‘ violence is unobvious recognition of helplessness’ [1,p.5]. The German playwright B.Breht stated that people gain life experience living through disasters and their deviant behaviour as well as suicidal or violent presuppose , that person wants to become trash the disposal of which will clean the environment [2].

Autoaggressive (suicidal behaviour) of different age groups has its specifics and common patterns of the choice of methods and motivation[3]. Ceremonial suicide is connected with desire to preserve harmony with society. It lacks the freedom of making a decision on leaving life , it lacks the freedom of making a decision on the choice of means , of place and of time, it also deprives the person ‘of self-expression in suicide act’[4, p.96].

Suicides can be classified as on ideological background (political , unacceptance of society values) [5, cp.239], unhappiness in private life, suisides at war (action on inpairing the enemy when killing yourself ; commiting suicide to evoid captivity [6, p.132]; considering terminology, the act of self- sacrifice aiming at saving comrades-in-arms can also be qualified as suicide).

It is critical to analyse the attitude of islam to suicide . The criteria of people’s distinction in the face of Allah between righteous and sinners, believers and the faithless is comformation with the Law of divine Revalation .Following this law one can find salvation and success in life , make their life balanced and bring all life matters into correspondence with rules of existence and in the case of disobidience – adversity and death. This means that people who loose harmony loose their life roads and become unhappy in both worlds. Islam makes it clear that Allah created this world as a probation for a man. The purpose of earthly life is seen in overcoming difficulties , only in probation the humans reveal their hearts, deeds and thoughts. The most frequent victims of suicide become those who failed to understand the essence and the mission of their life . Lots of people are ready to leave this world becouse they consider it imperfect , lacking harmony and conciliation. Koran reads that Allah created Paradise for pleasure while the purpose of this world is overcoming adversities. For instance “ Blessed are those in power, who are capable of any deed, who created death and life to probe you and see whose actions shall prove to be better. He is Mighty and Forgiving “(Koran , 67: 1-2). Therefore , the earthly life represents a durable and consequent individual test with certain laws and rules , restrictions and feasible requirements the core of which is humility to Allah. The reasons of those who chose to follow the way of mujahid-shahid are different. We consider some of them. Suicidal behaviour is the result of loosing the sense of life. This is the main reason of commiting a suicide , for the rest of other reasons are the results of deceitful perception of the meaninglessness of life. If the life looses its sense than either commotion might make the person deprive them of it , for the affected logics suggests the pointlessness of overcoming difficulties for the sake of saving something that has no sense . This understanding of a person’s mission and of their objectives and how to meet them are those matters which give the person conciliation and psychical equilibrium . In islam tradition the sense of human life lies in Allah adoration. In order to prove this statement here goes the ayat text :” I created the spirits (jinns) and humans with the purpose of their adoration of Me” (Koran 51 : 56 ,) and further “ Your

Lord said : ‘Beseech Me and I shall respond you . Truly , those who show arrogance denying adoration of Me shall ented the Hell being vile ” (Koran 40: 60), “ He is glorified by seven heavens , by the earth and those who live on it. There is nothing whict wouldn’t do so , but you shall not understand this praise. Truly, He is Patient and Forgiving” (Koran , 17 : 44). Due to Islam human being is supposed to be the creature of Allah and His slave. The human faces the choice – either to be a humble slave and enter the Paradise or to be a rebel and enter the Hell. Among other reasons leading to suicide it is worth to mention the following : the failure to achieve one’s potential in profession or fatigue of l ife. Islam helps the human find their foreordination . Earthly life presupposes only temporary tasks. The obstacle which is put by islam in front of suicide is the faith of predestination (kadar). The belief that all goodness which belongs to a mussulman was given to him by Allah to the extent which he needs. Realising this, the human understands that the present situation is the best one for him considering that Allah’s foreordination is the only good for us. Any misfortune occuring to us is inscribed in the Book (Entreasured Scroll) before it happens to us . We suggest to incriminate the attempts of mujahids to bring into action terroristic plans as religious ceremonial suicides. Islam identidies this practice as destructive one. Shariat is to preserve everything leading to wellbeing of a human. Koran reads “ Do not kill yourselves for Allah is merciful. We shall commit to the flames those who will do it out of hostility or injustice “ (Koran , 4:29) Thus islam prohibits suicide. If a human tries to acquire well-being or wants to get rid of some problems with the help of forbidden deeds , he will receive an opposite result. “ Be aware that Allah comes between the human and his heart (i.e. can prevent him from achieving what he desires) and you shall be gathered for Him” (Koran , 8: 24).

Suisides at war (action on inpairing the enemy when killing yourself ; commiting suicide to evoid captivity; considering terminology, the act of self- sacrifice aiming at saving comrades-in-arms can also be qualified as suicide) . For instance , self-demolitions which are committed during military actions or against civilians . According to Islan scholars muslim warrior has a right to head into the middle of hostile troops even if it is certain that he will be killed. However, many scholars and imam Abd-al-Aziz bin Baz, imam Mohammed al-Usaymin and many others banned this. In particular sheik Mohammed ibn Salih al-Usaymin in his comments to the book ‘The Gardens of the Faithful “ said : “ Concerning the suicides committed by some people who take the explosives and threaten those faithless and commit the demjlitions , may Allah prevent them. The one who kills himself will be burnt forever in the Flames of Hell. Because this is killing yourself not for the good of Islam. If he kills himself and tens or hundreds of other people this will do no good to Islam, people will not enter this religion . For this reason we believe that all these suicides which are committed by some people are the acts of killing the soul, and they are against the law and this will lead them to Hell , may Allah prevent them from this.Those who do this are not shahids (the martyrs for Faith). If a human commits the suicide out of his wrong belief that he has the right to do so we can only hope that this will not be counted as his personal sin . And what is about his being a shahid he will not receive his punishment because he didn’t follow the way leading to achieving the degree of shahid “[7]. In addition it is worth mentioning that it is very important to point out the role of the message contained in the “ Epistle of sheik Abd al-Aziz bin Abdulla al ash-Sheik may Allah save him, which was written on the concern of air attack of the buildings of World Trade Center in the USA” [8].

Focusing our attention on the motives leading to suicides it is critically important to draw muslims’ attention on genuine causes of the mentioned problem. Among them we can emphasize the following – weakness of faith (Imam) or its complete lack, the lack of the link with Allah (du’a), the lack jf recumbence upon Allah and despair, the lack op patience, lack of awareness of the punishment for committing suicide, the lack of guidance in life and the rejection of memory of Allah (zikr).

Conclusion

Considering the actions of suicide bombers (in this case setting themselves as adherents of islam) as ceremonial suicide will enable us to define the named action as an extreme sinfulness and

ontological destruction of an individual and thus depriving it of its existential appeal.

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O.V. Chemakina, Candidate of Architecture, Prof. (NAU, Kyiv, Ukraine)
V. P. Mironenko, Doctor of Architecture, Prof. (KHNUOBA, Ukraine)

PROBLEMS OF HUMANIZING OF ARCHITECTURAL ENVIRONMENT OF AIR TERMINALS ON THE MODERN STAGE OF DEVELOPMENT OF ASSOCIATION

The enormous amount of people moves in cities all over the world, doing a city environment most attractive for investing. Increase of population, increase of scales of production, contamination of environment, chaotic point building, and unregulated infrastructure, here basic problems of architectural environment. Modern architectural and designer decisions are more oriented on conditioning, harmonious coexistence of nature and man. Instead of predominating before and widespread in our days post modernism approaches, which enable to combine a benefit, durability, beauty, are all more frequent used, now yet and safety, in blessing everybody, societies on the whole and environment in particular. Tendencies which characterize a modern world culture are designated as humanism. Humanizing is the attribute of the formed post industrial society. One of basic displays of this tendency is confession of anthropocentric of any profession, which, possessing mobile, changeable maintenance, is stable description of world culture. These problems as the central are fixed in publications, researches of different level, and also in the decisions of government during the last two decades, and their decision requires complex approach, updating of theory and design technique .

In obedience to the conference of UNO on an environment and development in Rio de Janeiro of 1992, as an alternative of unlimited urbanization and to the economy growing, conception of steady development is examined are models of socio-economic life of society, during realization of which satisfaction of vital necessities of present generation of people is arrived at without privation of such possibility of future generations.

In domestic scientific literature at the end of 80th were distinguished and described basic variants of conception of stability, as displays of humanizing on the example of the designer planning. Development of theory and methods of teaching of designers is in the aspect of humanizing of architectural environment, does not mean abandonment from existent traditions. The modern architectonically-designer planning must reflect traditions and experience, accumulated during all his history - domestic experience, and also huge experience of activity of the known foreign architectonically-designer schools of the past and now.

In labors of many scientists theoretical conception of interrelation of nature and society is offered as different and interpenetrative educations. It is considered that, foremost, it is necessary to turn the most serious attention on already existent ekosistemu. In architectural conception which was formulated by an architect KenYeang, architecture must imitate natural ecosystems, trying to attain balance between organic and not organic mass. Also meaningful for research are theoretical conceptions in area of ecology: S. B. Chistyakova "Guard of environment", Yu.G.Markov the "Social factors ecologically steady development", O. Z. Kolbasova. "Internationally is a legal safeguard of environment".

What is a humanizing effect of the architectural environment. Humanism (from lat. humanitas - humanity, lat. humanus-human, lat. homo - people), worldview, centered on the idea of man as the supreme value, a naturalistic (or scientific) humanism, an eclectic collection of plants produced in the modern scientific era and focused on the belief in a supreme value and self-improvement of the human person. For the first time the term appears in the Renaissance (in the narrow meaning characterizes the cultural movement in Europe (XIV-XVI centuries). (especially in Italy and Germany).

In modern usage for teaching noosphere (by V.I. Vernadskiy) as a super system in which can be implemented sustainable development of its subsystems: nature and society. Implies recognition anthropocentricity any profession, which, having a mobile, volatile content, is a stable characteristic of world culture puts emphasis on the characteristics and needs, creating an environment for

personal development, but it suggests that human preferences, attitudes, technology and culture must evolve together with nature and reflect the breadth of environmental capacity and, more importantly, environmental constraints, ie mutual importance of cultural and biological development. The concept of "environment" emerges as a reflection of the professional consciousness of the results of human activity, united by a common design methods and principles of the formation. Denotes that part of our environment, which is formed by the architectural reasonable three-dimensional structures, systems improvement, united in the integrity of the laws of artistic unity.

Inalienable part of the formation of modern humanistic architectural environment, are the concepts: Green architecture ("green" architecture), and sustainable architecture ("sustainable" architecture). Green building ("green" or sustainable capacity building), is the practice of creating structures and using processes that are environmentally responsible with the effective use of resources throughout the "life cycle" of the building. An important role in the search for new approaches and new solutions that would harmoniously social goals, including the decisions of artistic and aesthetic issues, and scientific and technical tools can play an architectural bionics. Bionics (from grech. βίον element of life, literally, living) is the use of applied science in technical devices and systems, organizational principles, properties, functions and structures of nature, that is a form of living in nature and their industrial counterparts. Architecture and construction bionics is studying the laws of formation and structure of living tissues, is engaged in the analysis of structural systems of living organisms on the principle of economy of material, energy and reliability.

Vector humane from the beginning was not so formalistic as prototypical and conceptual. It relies on the following principles: the use of solar energy, the decline in new construction, efficient use of materials, respect for the inmate, and respect for the place, the principle of integrity, conservation of energy. One method of humanizing the built environment is the use of natural materials, the closest person psychologically, as well as the application of modern technologies.

Awareness of environmental problems, interest in the social aspect of the architecture, the prevalence of focus on public space, an understanding of the structure of the city, its relationship to nature and man, the interaction of the urban environment in general and in particular the construction and development of new technologies has become specialized in the late XX century in the large-scale project of humanization of society and its habitat. Globally, the international community makes the task of population stabilization, leveling of the countries producing goods safe manufacturing processes, ensuring environmental sustainability. In the domestic development of high-quality global model is proposed which includes three main blocks: the natural environment, built environment and society.

A method of forming the landscape by integrating into it the architecture structures are now widely used in the world: a set of nine semi-subterranean homes, a project erdhaus (PeterVetsch1993), Museum HistorialdelaVendée (2006), the building of the California Academy of Sciences (California Academy of Sciences) (architect Renzo Piano, 2009) . The principle of conservation of energy was first used in the school building in the town of St. George Uollazi (architect Emslie Morgan, 1961), and elementary school complex in the Belgian city of Tournai (architect Jean Ville-range). The following examples are: the headquarters of Scandinavian Airlines in Stockholm (architect Niels Torp), SwissRe (SwissRe) in London (architect Norman Foster). The building of the Bank of Amsterdam NMV (architect Tone Alberta) - recognized as the best energy-efficient office in the world.

The design and construction in the industrialized countries - the U.S., Japan and Western Europe has a great diversity of programs, staff functions and architectural solutions. Here is a list of the top twenty "green" cities are actively introducing humane methods: 1. Stockholm, Sweden 2. Oslo, Norway 3. Munich, Germany 4. Paris, France 5. Frankfurt, Germany 6. Stuttgart, Germany 7. Lyon, France 8. Dusseldorf, Germany 9. Nantes, France 10. Copenhagen, Denmark 11. Geneva, Switzerland 12. Zurich, Switzerland 13. Glasgow, UK 14. Barcelona, Spain 15. New York, USA 16. Brussels, Belgium 17. Hamburg, Germany 18. Hong Kong, China 19. Newcastle, UK 20. Tokyo, Japan. Examples of modern foreign practices demonstrate a range of opportunities for the

development of architecture and design in this area. The evolution of form and function of these objects confirms the intention of the developed countries to invest in aesthetic and functional upgrade of the space.

Create an architectural environment in the existing aero complex for comfortable passengers staying, meeting and staff requires the use of all possible architectural and artistic means of a combination of architectural form and materials to color and texture.

Under conditions of rapid development of construction technologies can track changes in methods of interior furnishing premises pereoblashtuvannya internal spaces, industrial areas of airports. Methods facades, their updating and completion in each case determined by the technical capabilities and needs aero complex and economic possibilities of the city in which it is located.

In the terminal or airport terminal, transport function and the comfort of passengers and staff is leading, so all methods and means of improving architectural and spatial environment of comfort including technical equipment should be use. A general problem of forming a comfortable humane environment, each element of this complex organism aimed at improving transport and temporary stay comfortable people in the built environment of airports.

Conclusion

Chief principle of sustainable development (cooperation of countries and civilization achievements to balance the interests on the basis of consent) can be realizated only in the event seriously adequate analysis by every country of its culture, the realized of its spiritual principles, system of national values, mechanisms of the "opening", "adaptability" and "immunity. " The main problems of architecture today are the relate airport complexes meaning of human vital functions and existence, for any interpretation of architectural forms is, ultimately, their translation into the language of humanization and interaction.

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Yu.O. Doroshenko, d.t.sc., prof. (NAU, Ukraine)

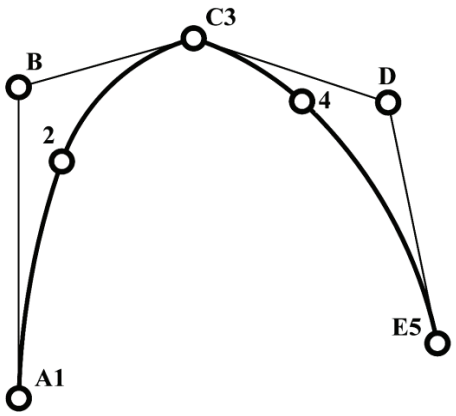
ARCHS IN ARCHITECTURE OF THE AIRPORTS BUILDINGS

At the article of constructing of archs as architectural elements of airports building it is suggested to carry out a method of the deformative constructing on the basis of biarcs. Thus the structural constituents of the computer-oriented deformative constructing is a geometrical prototype (or their certain aggregate), managing machine, additional parameters of form of changeable prototype, functional (algorithmic) connection between a managing machine and a created object of the interface "COMPUTER USER".

Archs are often enough used in buildings of airports with the purpose of to give their architecture the greater artistic expressiveness and promote originality of building appearance (pict. 1). Thus a datum (shape-generating) line of arch more frequent of all is the made iterative flat curve which is set by compass arc, as a smooth basket line, made from the arcs of circles of different diameters and with possible violation of smoothness of all of line in the top of arch. In the most general case the styled datum (form creational) line of arch can consist of four arcs of circles and look like on the picture number 2 (crooked line of A1-2-C3-4-E5). In practice the amount of arch arcs can be varied from four to one.

Picture 1. Application of archs is in architecture of buildings of air-ports

The form creation of arch during the architectural planning of certain object foresees realization of some creative searching process, directed on the receipt of geometrical form of arch which will satisfy certain requirements and conditions. It is suggested to carry out realization of such process as method of the strain constructing [1]. The last needs the presence of some geometrical prototype (as original setter of initial geometrical form of the created object) and machine control of purposeful variation of form of prototype. Example: the arc of curve of the second order in the engineering variant of the setter is determined with an accompanying triangle (by three tops) and numerical value of the discriminant $0 \le f \le 1$. The purposeful change of position of tops of accompanying triangle and numerical value of the discriminant allows to vary the form of arc crooked of the second order, that is to "create the planeform" of the crooked line search of most suitable in accordance with decided architectural problem specifications.



Picture 2. The generalized styled datum (form creational) line of arch

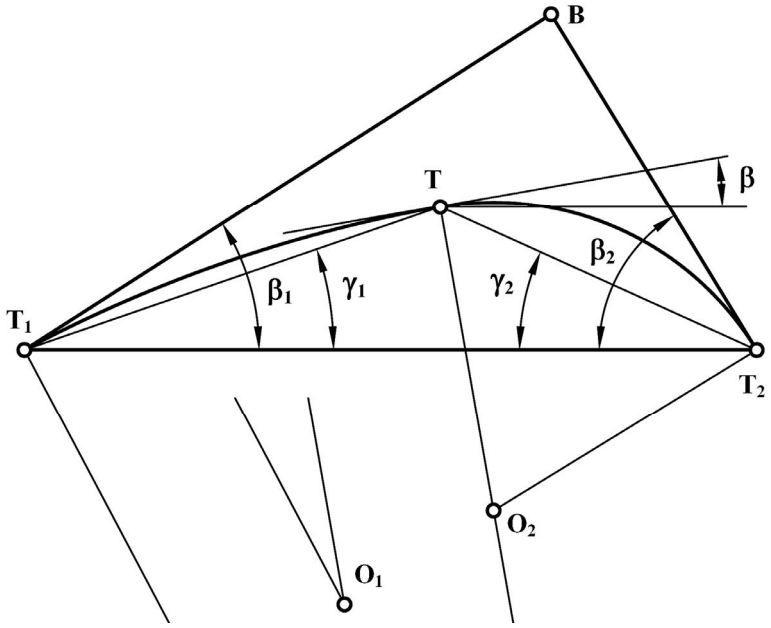
According to the graphicly formalized (pict. 1) task of form creation of datum line of arch its prototype (by a

foretype) is a curve of the line of A1-2-C3-4-E5 (sequence of arcs of circles of A1-2, 2-C3, C3-4, 4-E5); a managing vehicle is accompanying polyline A1-B-C3-D-E5; by restrictive conditions is a location of supporting points (A1 and E5) and smoothness of line in the top of arch (dot number C3); the additional parameters of form crooked can be requirements in relation to the location of intermediate points 2 and 4. Purposeful variation of configuration accompanying broken together with the concrete numerical values of the selected parameters and with simultaneous satisfaction of restrictive conditions will enable to project the datum line of arch of the most suitable form.

Strain of constructing of geometrics foresees searching of creative and iterative character of work, oriented on computer realization, and actually development of algorithm of mutually determination of numerical descriptions of arcs circles of A1-2, 2-C3, C3-4, 4-E5 of the datum line of arch under the conditions is an intricate problem with probability of receipt ambiguous upshot. There is one of possible variants of upshot simplification of the noted task dividing of datum line of arch by two biarc. At that rate all of task disintegrates on two more simple tasks of two biarcs constructing at the certain terms [2–4].

Biarc shows by itself the two link curve from two conjugating arcs of circles (pict. 3). The form of biarc is set a scalene triangle, two tops of which are the eventual points of curve, and the third top sets likings tangent for a curve in the extreme points of biarc. The arcs of circles of biarc are conjugated in the so-called additional knot. The location of additional knot (points of interface) in relation to the accompanying triangle of biarc is set a separate parameter. Therefore the key moment of construction of concrete biarc is position-finding of additional knot of T.

The description of the method of being of additional knot of biarc is the next. For comfort of further work will agree to construct biarc (to calculate their parameters) in the in-plant cartesian system of co-ordinates, beginning of which coincides with the left eventual point of the biarc of T1, abscise axis is directed on the right along segment of T1T2, and y-axis, orthogonal to its upwards.



Picture 3. Form creation of biarc

Left corner β_1 accompanying triangle of biarc will consider less than right β_2. That is $\beta_1<\beta_2$ та $|T_1B|>|BT_2|$.

Development, realization and analysis of algorithms of calculation of co-ordinates of additional knot of biarc publications [2-4]. For a base parameter, which determines the form of biarc and, certainly, location of additional knot of T, the angle of slope β of tangent of biarc is select in the point of T to segment of T_1T_2 (to abscise axis of the in-plant system of co-ordinates of biarc). Will designate α_1 and α_2 angles of slope of tangents of biarc in its extreme points (tops of T_1 and T_2 of corresponding triangle) to the chords of T_1T and TT_2 accordingly. Let is examine protuberant biarc.

According to the picture 3 and taking into account properties of arcs of circles we should write down:

$$\begin{cases}\gamma_1+\gamma_2=\Theta\\ \alpha_1+\alpha_2=\Theta\end{cases};\ \begin{cases}\gamma_1+\alpha_1=\beta_1\\ \gamma_2+\alpha_2=\beta_2\end{cases};\ \gamma_1+\alpha_1+\gamma_2+\alpha_2=\beta_1+\beta_2=2\Theta \text{ and } \begin{cases}\alpha_1=\gamma_1-\beta\\ \alpha_2=\gamma_2+\beta\end{cases},$$

from where $\gamma_1=\dfrac{\beta_1+\beta}{2}$ and $\gamma_2=\dfrac{\beta_2-\beta}{2}$.

The corners of γ_1 and γ_2 set the pair of lines, the intersection of which determines position of

additional knot of T of biarc. The got dependences enable to construct different of the biarc for a the same accompanying triangle on the set size of corner β.

From all possible configurations of biark such in which the additional knot of T is found on condition of optimal value of angle of slope of tangent appear most suitable β. Local minimum of one is thus arrived at the following functions:

1) $|R_1 - R_2| \to \min$ at $\beta = \frac{\beta_1 + \beta_2}{2}$;

2) $\left|\frac{R_1}{R_2} - 1\right| \to \min$ at $\beta = 0$;

3) $\left|\frac{1}{R_1} - \frac{1}{R_2}\right| \to \min$ at $\beta = -\frac{\beta_1 + \beta_2}{2}$.

In many applied tasks the additional knot of T is set on the size of parameter of t, $t_{min} \le t \le t_{max}=1$ along the segment of T_1T_2. And mostly at t=0,5. Then $\gamma_1 = \gamma_2$ and $\beta = (\beta_2 - \beta_1)/2$.

At $\beta_1=\beta_2$ appears arch from one circle arc.

The mathematical dependences over brought in the article are realized in a programmatic appendix to CAD of AutoCAD and used for the deformative constructing of archs.

Conclusions

In the article offered the form creation of the archs as architectural elements of buildings of airports to carry out a method the constructing on the basis of biarcs.

Thus in basis of the deformative constructing as a general method of the guided multistep computer synthesis (form creative) of form of geometrics (crooked lines, surfaces and bodies) with the use of the determined amount of prototypes (foretypes) or primary forming elements purposeful gradual deformation of which will generate the geometric (GO) of desirable form, it is fixed deformation (as a capacity for deformation) of GO-prototype.

Such process control is carried out by means of the simple shown evidently vehicle which has geometrical nature and assumes simple graphic interpretation, and its configuration simply determines the form of created GO on the whole or separate its forming elements. The structural constituents of the computer-oriented deformative constructing is a GO - foretypes (or their certain aggregate), managing vehicle, additional parameters of form of changeable prototype, functional (algorithmic) connection (law) between a managing machine and created GO, interface "COMPUTER–USER".

The concomitant broken together with the condition of location of additional knot determines configuration of the two biarcs, which in turn sets the form of datum (form creative) line of arch and all arch on the whole. The optimality of form of every biarc is thus provided.

The program made after the mathematical dependences over brought in the article is used during automatic variant-searching of archs.

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N.Yu. Avdieieva, candidate of architecture (National Aviation University, Ukraine)

RECEPTIONS OF DEFENCE OF DWELLING ENVIRONMENT ARE NEARBY AIRPORTS

In the article rises the problem of forming of dwelling-houses in a complex with the objects of public service on territories close to the airports. The structural receptions of architectonically-plan decisions of dwellings and public houses are examined for protecting of housing environment from negative influence of airports.

Raising of problem. Coming from the increase of quantity of population of a city, necessity of providing his accommodation, a requirement appears in territories of placing of all types of building. As practice, planning and building of objects of housing complexes, testifies on territories close to the airports gets wide and intensive development abroad in many countries: Germany, France, Spain, UC, USA (pict. 1). Placing of airport very close to municipal territory provides advantages for establishing external economic connections and development of economic activity. At the same time, the factors of unfavorable influence on an environment, caused by air processes, need co-ordination and concordance of actions of scientists, architects, engineers and other specialists called to provide forming of housing environment at deserving level. The analysis of numerous research works showed that methodological bases of problem cooperations of ecological, architectonically-plan decisions, that is sent to creation of comfort housing environment on territories close to the airports, remained unsolved largely. Therefore actual are development and use of receptions of building on the basis of complex decision of architectonically-plan and structural tasks. It is thus necessary to take into account the factors of negative influence on an environment, related to intensive activity of airports, state of park of modern air ships, increase of speed and carrying capacity of airplanes, excrescence of areas, that airports are occupy.

Review of literature. Review of going near planning and protecting from contaminations on territories nearby airports, normative information in relation to building are presented in [1-3]. Defence of housing and public objects and providing of necessary comfort must be decided with the necessary use of structural noise defence researches [1-3].

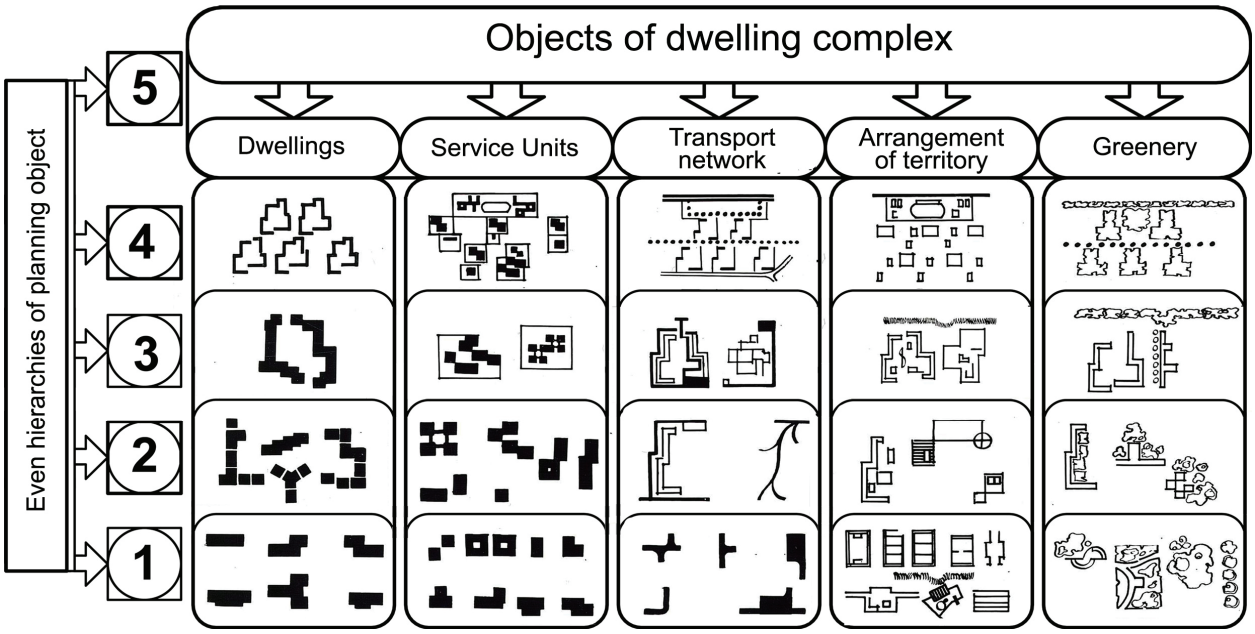
Aim of the article. The aim is organization of structural protective events in the objects of housing complex with implementation of all normative requirements in ecologically dangerous areas on territories nearby airports.

Basic part. On the basis of a generalization of modern researches in engineering sciences, medicine, ecology [3] it is necessary to be stopped for the consequences of influence of airports on an environment. The results of researches of results from the action of aviation transport are testify that the problem of harmful influence really exists. This influence shows up in the far of types of contamination of environment from an aviation transport: acoustic, mechanical, thermal, chemical, electromagnetic, radioactive. It depends, for example, from the construction of airplanes, from the

Pict. 1. Organizations of territory close to the airport. Foreign experience.

height of their flight, operating of aerotechics, emergency situations and technology of exploitation conditions. The surface sources of contamination are conditionally divided into such, that are into an airport and those that are located after its limits, but identically dangerous for an environment.

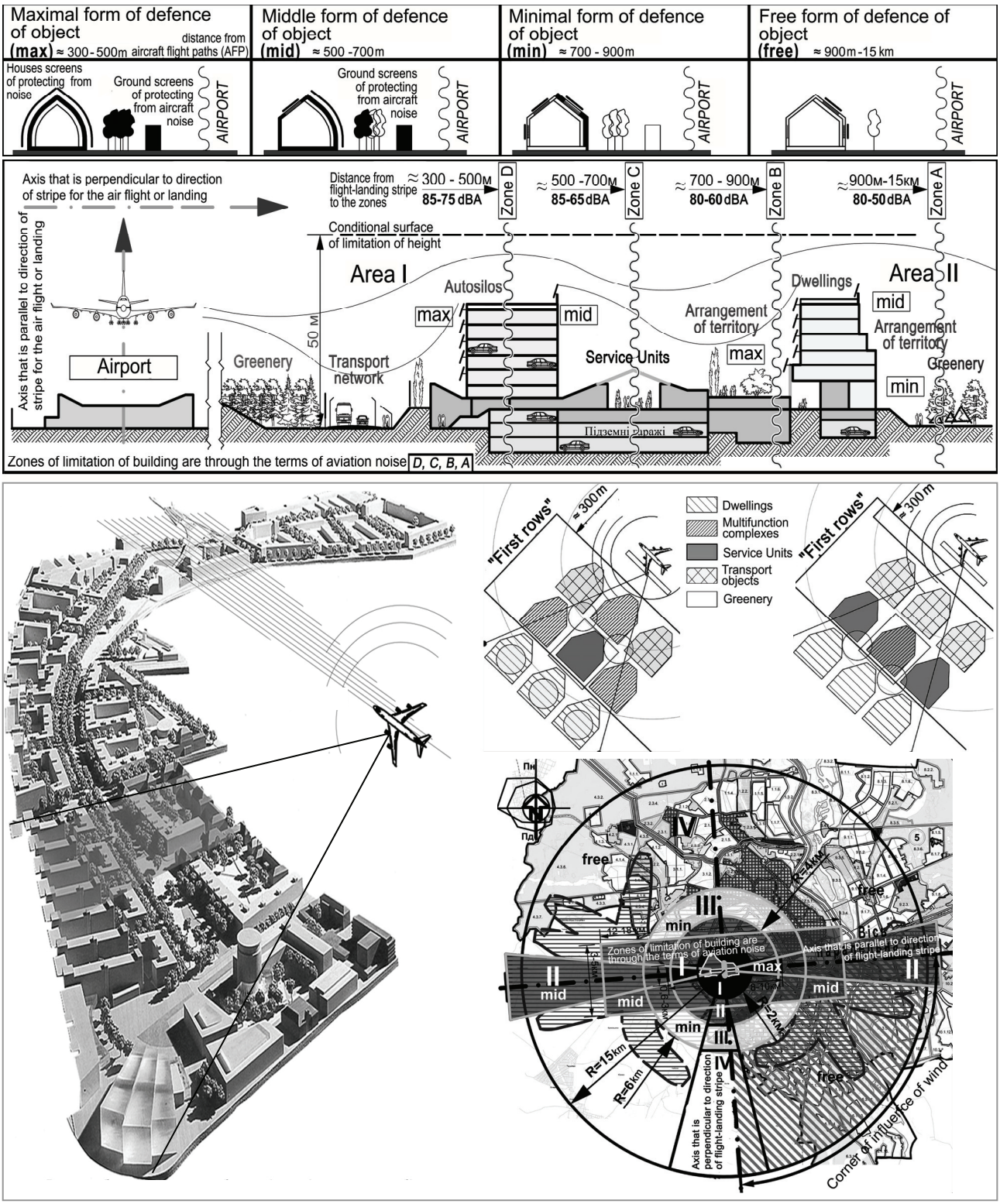
The necessity of systematization of plenty of requirements to the process of planning is stipulated by the uses of approach of the systems to functional organization of process of planning of dwelling-houses in a complex with the objects of a public service on a territory close to the airport. In practice, planning is not exhaust methodical bases of forming of objects of housing complex for the special town-planning terms taking into account development and reconstruction of these territories. In most examples from home practice events in relation to the decline of influence of negative factors on territory are touch only separate building. Thus attention not enough is spared to position that considerable results in environmental preservation can be attained by structural and architectonically-plan receptions on condition of approach of the systems to forming of building. Organization of structural protective events, implementation of all normative requirements in ecologically dangerous areas on territories that are close to the airports, is one of basic effective directions of forming of architectonically-plan decisions.



Pict. 2. The structural model "Objects of dwelling complex"

Approach of the systems to forming of building is based on the stage-by-stage forming of outline of planning object and provided by the decision of architectonically-plan variants of objects of housing complex on territories close to the airports (pict. 2). On the basis of analysis of the systems a structural model offers "objects of dwelling complex", that consists of five subsystems and shows a soba the hierarchy of elements, on that further classifications of elements are based at every level, that allows to define tendencies and prospects of their development for forming on territories close to the airports [1].

The harmonization of architectural environment must be arrived at by a complex decision of the both internal space building and external surroundings. The special location of dwelling-houses, objects of public service on territories nearby airports is formed depending on organization of their internal space, structural and architectonically-plan decisions and taking into account protecting from negative factors. At clear architectonically-plan tasks non-permanent such decide as protecting from a vibration and harmful extrass. At the same time a main harmful factor is remained by noise. It is known that principal reason of the noise loading on housing building are surface operations of airplanes at texing by air, acceleration, flight and set of height. Reduction of the negative affected of airport zone on territory of building (on free territories or on territories, that are need a renovation) will come true by introduction of recommendations in relation to forming of structural, architectonically-plan receptions and application of corresponding facilities of defence (pict. 3).



Pict. 3. Forming of dwelling-houses in a complex with the objects of public service on territories close to the airports.

The objects of housing complex is recommended to place depending on the generalized and classified receptions of building taking into account minimization of negative influence of airport by functional planning, form creative, corresponding structural decisions: functional planning of the territories; functional planning if the objects of housing complex; form creativeness of building; form creativeness of objects of housing complex; structural defence of building; structural defence of apartments.

In the article structural facilities are examined in relation to providing of sanitary normative levels of noises, vibrations sent for protecting from influence of negative factors of airport.

Conclusions

It is recommended to conduct forming of objects of dwelling complexes on territories, close to the airports after the next receptions:

1. For organization of housing building, housing groups, houses it is recommended:

- to form territories of housing building mainly quarter-perimetric; to produce increase requirements in relation to organization of the functional and architectural planning depending on distance and place of being of airport;

- to conduct planning of separate parts of territories that are in a housing complex in the "first rows" near an airport by smallfloors individual houses or blocked structural groups, the point or many sectional houses, located frontal, mirror, in parallel, as wedging, with a change for a reflection or absorption of contamination;

- to form housing groups arcwise, zigzag, wave, curdoneers, with general court space inwardly, that will have a half closed court with the housing apartments oriented in the middle of court space;

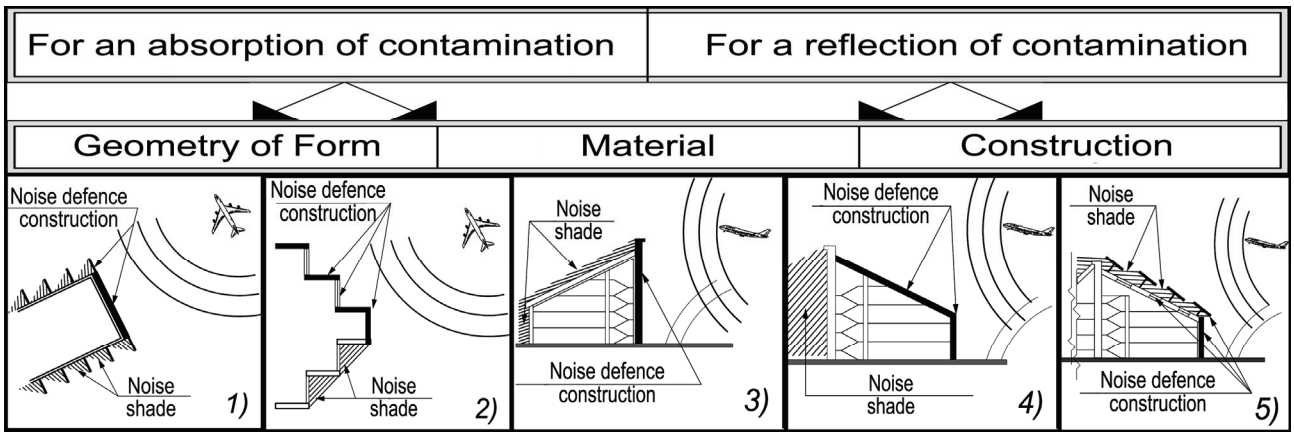
- to plan the different corner of turn of separate housing group in relation to an airport for a reflection or for absorption of contamination (pict. 4); to limit superficiality of houses taking into account safety of flights; to carry out a defence also by the location of rooms under a corner; to form the different form of volume of a house; to use the different forms of a roof (mainly outbowed roofs) with the angle of slope of roof in relation to an airport in combination with outbowed forms that will remove noise of airplanes at flight and landing (almost on 60%); form of wall under a corner or outbowed with an increase structural defence (revetment porous, elastic noise taking in material or planting of greenery);

- to set sound-proof external constructions (walls, windows) in the apartments of permanent stay of man; to protect an increase construction of external wall stair cages, corridors and butt-end parts of houses; to apply jetties and balconies with external insertions that face the noise taking in materials (replaces of screens) and oriented athwart to direction of distribution of influence of airport; to execute entrance doors in a dwelling-house in thick a 40 mm with the continuous filling along the height of linen, to take into account material, profile and sizes of crossing of making more compact gaskets, their amount and type, upholstering, influx on linen of doors; to conduct coverage of surfaces of internal walls materials with the high coefficients of acoustic absorption, to set facilities that disperse noise on walls and in the corners of apartments, use the elements of furnitures that will assist dispersion of voice energy and additional absorption; for the increase of sound-proofing in a middle an apartment to apply ceiling panels with high-efficiency acoustic absorption;

- all apartments must be oriented mainly to internal space of housing complex (to the court) at side of an acoustic shade, west-to-east from an airport; a housing room can be oriented in direction of airport only in three-room apartments or with the greater amount of rooms on condition of application of increase sound-proof external constructions; to dissociate housing rooms from an ambientnoise by non-residential premises to that it is not set acoustic requirements - corridors, antechambers, technical knots, kitchens; kitchens and technical knots are necessary to be taken away in a separate complex with direction toward an airport; to dispose stair cages from the side of airport with the aim of defence of housing rooms from harmful influence;

- to form a noise taking in an extra on the overhead floors of dwelling-house for protecting from contamination by arranging of the special functional apartments (objects of public food consumption, offices, administrative, technical apartments), also to form are mansards, winter gardens, terraces with the elements of planting of greenery, creative workshops, studio apartments direct-coupled with an accommodation with the aim of separation of accommodation from noise of airport;

- to set the screens of securing for walls (biobarriers, classic abat-voixes, cantilever panels); T- , Y- similar, tubular and multicostal attachments with coverage by a noise taking in materials on the edges of screen, very thin materials from glass and the plastic arts; to use



Pict. 4. Receptions of minimization of negative influence of airport by functional planning, form creative, corresponding structural decisions.

abat-voixes that are inclined under the set corner and face a noise taking in materials (screens of securing are for a roof);

- to apply increase glasseness from the side of airport, using three-layered special glasseness for the increase of superficial closeness of wall, window (reflection of noise), or to diminish an amount and an area of the window opening; to improve the sound-proof qualities of the windows of the houses the sealing-in of leaves and glasseness, by the increase of intervals between glass and in thick glass, by application of triple glasseness, approaching of middle glass to extreme, by sound absorbing layers on the perimeter of an interglass space; due to the nospread function of glass package from glass of different thickness on "technology of decline of noise";

- to use in equipped objects contrasting materials (even red color) for the daily marking in the stripe of the air going near the air field; to set the centralized checking of safety, that allow to watch an ecological level and state of fire safety as inwardly so outside of the court systems in houses; to apply the engineering rigging (system of aeration, noise protactive muffled options, increase quality and manufacturability building and finishing materials) is specialized in houses; to use ventilations: wall-type, window; to set different models that provide simultaneously a wave and extraction of air from an apartment at the closed window.

2. For organization of public service it is recommended:

- to place on the ground floors of dwelling-houses the built-in, built-in-built on objects of service, that form linear community centres, that gives an opportunity to protect an accommodation from contamination;

- to conduct building the separate multifunction objects of public service, the form of that will realize protecting from contamination conditional borders for a reflection or absorption of contamination;

- to avoid placing of loud enterprises (domestic consumer and communal services, public food consumption and others like that) from the side of court, and to dispose them only toward a street and in direction of airport, not to fill up an already existent sound-level in housing part of building;

- to form separate territories the zones of public service(centers of culture and leisure, sport-health complexes, general schools, parochial churches, specialized clubs and cafes) for partial defense of accommodation from influence of airport in particular in the zones of B and C of a noise influence of airport;

- to conduct building separate objects with the covered semiunderground or underground levels that consist of objects of public service for the complete protecting from influence of airport on free territories in the "first rows" of building in particular in the zones of B and C of a noise influence of airport.

3. For organization of street-transport network it is recommended:

- to form of communication spaces, that unite an accommodation with a community centre, stops of transport, by churches as streets with a glass cover, plants in a middle and

shops, by boulevards, trade arcades, athriums; if necessary boulevards are necessary to be converted into the trade arcades, recovered by easy constructions that are also protect a population from influence of negative factors of airport;

- to mark off housing building from an airport streets (highways, roads for a freight transport and transit motion), lines of autosilos, parking places;

- to apply the objects of storage of individual transport of citizens (garages-boxing, surface autosilos, mechanized parking places, and also covered stands of riding hall type) for the use person a noise protecting barrier after that, as after a screen, the zone of voice shade that gives an opportunity to decrease the limits of negative influence of airport appears.

4. For organization of equipping with modern amenities it is recommended:

- to place grounds for the different demographic groups of population with clear limits and orientation and corresponding equipment for protecting from contamination;

- to place on a roof stilobate parts of multifunction object or garage sport grounds and grounds with the elements of landscape design;

- to use the screens of securing for earth(noise protacting screens that are orient on the barriers of different types and constructions athwart to direction of distribution of influence of airport biobarriers, classic abat-voixes, cantilever panels) for creation of acoustic shade at side of the housing apartments.

5. For organization, planting of greenery is recommended:

- to conduct the intensive planting of greenery of areas of housing territory with clear limits and orientation and corresponding equipment for the decline of negative influence; to use the arboreal and shrub planting as noise protecting screens, that gives an opportunity partly to mark off housing or other building from the flying field of the airport; to use green plantations of the special setting (wall of green plantations from 50 m to 150 m and even more in a width and 6-8 m in high) that gives an opportunity to mark off housing building from an airport as noise protecting screens; to form a continuous wall from green plantations of the different kinds thickly landed to each other, that differ in a height (reduction to noise is on 30 dBA); to form for screening earthen billows, decorative protection, are planted trees and shrubs; to organize the protective elements of planting of greenery on the overfalls of artificial relief decorative brining downs and noise protective embankments (landscape decisions in a complex with abat-voixes allow to get the decline of noise decline to 10 dBA);

- to carry out planting of greenery mainly along streets in the "first row" of building within the limits of zones C and D of noise influence of airport;

- to use the constructions of green roofs and planting of greenery of walls of houses; to apply terraces with the elements of planting of greenery, directly on the overhead and middle floors of houses; to form covered linear pedestrian spaces are planted trees and shrubs that combine and protect built-in in a ground floor establishments of service.

It is set that to design and place of the dwelling-houses and objects of a public service on territories close to the airports, it is necessary by organization of receptions of architectonically-plan protective events in a complex with structural events from influence of negative ecological factors on an environment.

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L.M. Barmashyna, candidate of architecture, associate professor (NAU, Ukraine),
V.I. Vasylchenko (NAU, Ukraine),

ARCHITECTURAL AND PLANNING ORGANIZATION OF THE AIR TERMINAL COMPLEXES BASED ON THE PRINCIPLES OF UNIVERSAL DESIGN

The article is devoted to the complex of questions of forming of unimpeded spatial environment, namely to some features of functionally-planning organization of the air terminal complexes taking into account the requirements of physically challenged people, in particular the parameters of basic typological elements of the proper buildings.

The main objective of the airport as a multifunctional complex of buildings and facilities is maintenance of a service support in the suburbs and creation of all the necessary conditions for change from one mode of transportation to another. For example from rail or motor transport to air transport or vice versa. In many civilized countries buildings and elements of the air terminal's infrastructure are adapted to the needs of physically challenged people and individuals with limited mobility, namely: visually and hearing impaired people, citizens with prams, pregnant women and others. This is a sign of humane social policy and real unimpeded environment that functions according to certain laws, regulations and rules.

Access of physically challenged people to all objects of the urban environment, including the infrastructure of the air terminal complexes based on the principles on the barrierless technologies and universal design, requires adaptation of the most important elements (the so-called functional and typological units) to the needs of disabled people. Norms of the universal design are focused on the needs of disabled people who are considered as the most vulnerable and specific category of population, especially when we are speaking about characteristics of the physical environment. Adaptation of the material and space environment to the needs of disabled people increases its comfort and maintains the same level of comfort for other categories of people. So, norms of the universal design and barrierless technologies of forming of the material and space environment should take into account characteristics of the wheelchair, technological space of the physically challenged people and appropriate space for manoeuvre. According to one of the audit procedures devoted to the accessibility of public facilities, it was single-out nine main characteristics that have an influence on full and universal accessibility of the social infrastructure for all categories of people:

1. Free movement on the surrounding area.
2. Availability of the disabled parking not far from the entrance of the building.
3. The relevant inlet and outlet, parameters and design of doors.
4. Available entrance in the building, availability of appropriate ramps or compensation devices at the entrance.
5. Absence of thresholds and wide corridors.
6. Access to all floors in the building (elevators, escalators, ramps, etc.)
7. Availability of sanitary facilities (lavatory, shower room and so on) specially adapted for physically challenged people.
8. Accessibility of the pay phones and automatic teller machines for disabled people
9. Availability of the direction signs and routes of movement (icons, logo, etc.)

The aim of these measures is to provide safe passage in space and provide opportunities for usage of public domains and benefits. Standards of availability are different in various countries. Many countries have developed their own approaches, taking into account the best world practice. So uniform standards are formed for civilized countries and they take into account regional specifics and mentality.

Universal design provides:

-equality of usage of the public facilities for all categories of users;

-flexibility in usage, it is when one and the same device could be used by all people equally;

-simplicity, when the action does not require additional skills, experience or knowledge of language and can be done on the intuitive level;

-information and signal perception, including blind and deaf people, individuals with lower level of attention or with intellectual vices;

-tolerance to errors when accidental or unintentional action does not create much danger;

-minimal efforts, when the device or element of the environment causes minimal fatigue during prolonged action, and also one-time effort;

-sufficiency of size and space, including space for aids used by people with special needs, as well as limits of reach different for different people.

According to the nomenclature of the public facilities air terminal complexes belong to the objects and buildings of transport services, communication and information. These are railway stations, bus terminals, air terminals, airports and other facilities of the automobile, railway, water and air transport aimed at public service.

Physically challenged people, elderly person and people with young children very often use different modes of urban transport. As a result railway stations (river, sea, railroad, bus and air terminals) are very important for passengers, especially for those who are travelling for long distances. But in practice there are some drawbacks in planning, organization and maintenance of pedestrian routes in the terminal complexes, which impedes to the free movement of such category of people. The problem of transport service for disabled people is stipulated by lack of a special arrangement of public transport system and is also associated with drawbacks in building norms and regulations aimed at healthy people. In public buildings and the surrounding areas function so-called construction barriers (edgestones, stairs, narrow openings and passages, etc.) that put obstacles in the way of physically challenged people in wheelchairs.

Terminal complexes of different purpose (rail, bus, air) include functionally and compositionally interconnected with each other buildings, structures, components and devices directed at passenger service and implementation ticket, baggage, mail and other operations. Taking into account needs of the physically challenged people we must stress that it is very important to erect public facilities not far from the railway stations. In its turn it is reasonable to erect railway stations near hotels, shopping malls, restaurants, travel agencies, etc. Planning and technological requirements of such facilities must meet the needs of the disabled people.

If the hotels are located separately it is necessary to create special transport stops and parking lots that should be adapted for physically challenged people. Also we should not forget about hotel accommodations that for such kind of people should be only on the first floor and must be located near railway station, ports, air terminals or bus stops.

The necessity for separation of the footpaths and transport routes on the landside areas is determined, mainly, by the number of public transport units (buses, trolleybuses, trams, cars) and the conditions of their movement. For the sake of thorough organization of the pedestrian traffic near the landside areas it is necessary to stick to the following rules:

Arrange pedestrian areas in the central part of the landside area, which in its turn would be divided in two zones: arrival and departure;

Organize pedestrian traffic or road traffic in two or more levels. For example using tunnels, bridges and other structures for interchange flows of pedestrians and vehicles.

The width of the evacuation areas, bus stops and other public facilities should be increased for the benefits of the disabled people. It must be prohibited to place various kinds of stands on the sidewalks because it can impede the free movement of physically challenged people.

For the sake of thorough organization of traffic for physically challenged people it is reasonable to conduct at the landside areas such technical and planning measures like:

Avoid unevenness of the ground;

Arrange various kinds of waist rails for disabled people;

Place special fences near the vertical obstacles in order to make the surface smooth and slip-proof;

Arrange sspecial “relief stripes” on the sidewalks, which can warn physically challenged people about possible danger. Near the main entrance into the landside area should be arranged special disabled parking.

One-storey buildings of the air terminals which are included in the air terminal complexes have prolated form and reach a length of 200 - 300 m, which significantly increases the ways of movement of physically challenged people.

In order to maintain free movement of physically challenged people and individuals with

limited mobility in the air terminals should be implemented elevators , escalators or other means of transportation. The second option is to create special exit to the platform in the central part of the building for such kind of passengers.

In multistory buildings of the air terminals, zone for passengers usually takes two levels. Most top level (level of entrance to the plane) is for departing passengers, the lower (ground level) is for those who arrives and for operations with luggage. In order to maintain free movement of physically challenged people in the air terminals must be used elevators, ramps, escalators and special arrangement of stair flights. In case of their absence special wheelchairs should be provided for such kind of people.

Boarding and landing must be conducted on the short-ranged or long-ranged platform. While landing on the short-ranged platform from the second floor is used special aerobridge and from the ground level - special boarding bridge. Slope of the aerobridge for passengers in wheelchairs and individuals with limited mobility should not exceed 1:12. In the gallery for every 10 meters should be provided special horizontal platform with the following size 1.5 x 1.5 m.

When boarding on the plane from the ground level (landing) for lifting or lowering physically challenged people and people with limited abilities should be used special device - boarding bridge. While delivering passengers to the aircraft which is located on the long-ranged platform must be used special bus with low-floor and must be applied special folding ramp for physically challenged people and people with limited movement.

It is recommended to create in the air terminal special room for the escort service and special area for storage of the wheelchairs that are used by disabled people during registration, custom control and in-flight monitoring. It is advisable to conduct check-in for physically challenged passengers at the special stand, the height of which is 0.67 - 0.80 m, depth 0.4 - 0.6 meters.

It is better to place the ad box on the ceiling or on the registration stand that contains all the necessary information and has special lighting. In air terminals of the international airlines should be provided special zones for declaration filling equipped by special tables designed for passengers in wheelchairs.

Conclusion

Thus it should be noted that the design and construction of the air terminal complexes needs establishment of special nomenclature and planning parameters (special auxiliary equipment, devices, etc.). Special attention in the structure of public buildings and in particular of the air terminal complexes must be paid to horizontal and vertical communications, sanitary facilities, areas for temporary residence, zones of seats, servicing area and dining area which are the main typological nodes that should be adapted to the needs of disabled people. On the basis of the established parameters of these zones and their constituent elements, it is necessary to form ways and means of availability of appropriate infrastructure for disabled people and it is very important to remove all the obstacles (spatial, social, moral, psychological, etc.). Implementation in the architecture practice basic principles of the barrierless technologies and universal design is the most effective direction of psychological rehabilitation and social integration of physically challenged people.

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M. Barabash, the candidate of technical science, associate professor (NAU, Ukraine);
V. Pershakov, the candidate of technical science, professor (NAU, Ukraine)

SOME ASPECTS OF NSC OLIMPIYSKIY VARIANT DESIGNING ON THE BASE OF MODERN TECHNOLOGIES

Different approaches to choosing of roofing structural decisions over the modern grandstands were analyzed. Some variants of stadium roofing were considered. Expediency of taking into account the geometrical non-linearity at calculation of guy systems and membrane covering were proved.

Designing of any typical and unique installations is carried out at limitations on different resources: financial, material, power and others, so engineers-designers always try to find the most desirable, expedient, economically-efficient design decision that is supposed to be optimal.

The problem of optimal decision choosing at designing of installations is caused by certain criteria and sometimes some of them are mutually opposite. For example, speeding up of mounting works leads by itself increasing of economic indexes, decreasing of economic indexes leads to expenditure of excessive time and decreasing the safety of installation entirely, that couldn`t be allowable on conditions of such important objects` creation.

In most cases at evaluation of project is found one general criterion that reduce the multicriterial problem to the problem with one criterion. Very often the building value or volume of building and operational works during certain period is supposed as such general criterion.

The most reliable way to find the optimal variant – is comparative summary index of all possible variants. To do so, on different stages of designing is carried out the processing of variants for both particular installation`s structural elements and installation in whole.

Considering the stadium`s design it could be distinguished some general directions for given processing of possible variants. For example, some variants of grandstands` arrangement could be considered, different types of bearing structures, fastening system and so on could be proposed.

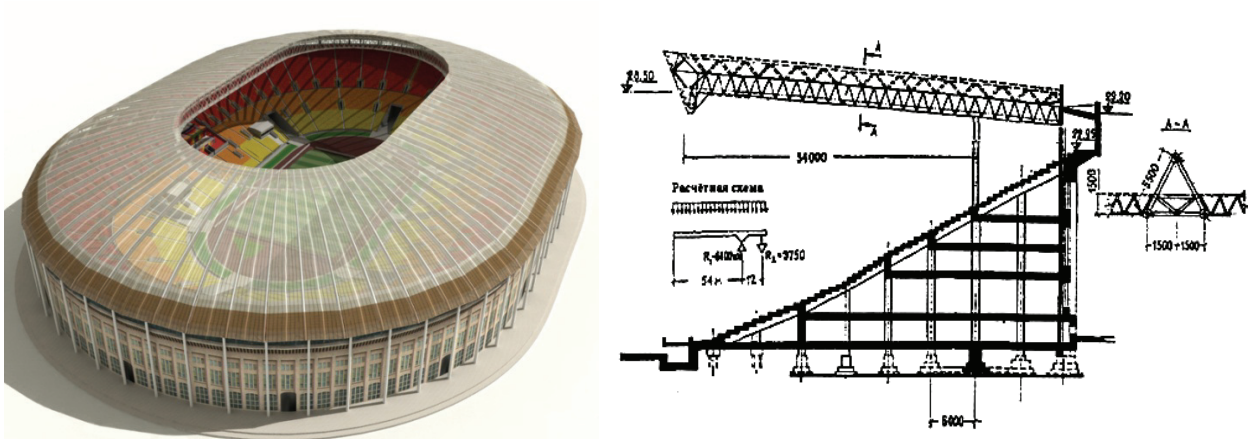
Traditional manual designing, that mainly was applied till the recent time, doesn`t give a possibility to consider the enough quantity of variants, because their processing and analyzing takes a lot of time and resources. Modern computer – aided design (CAD) - systems allow considering enough quantity of variants and analyzing each variant by indexes` complex of different criteria. So, in many design organizations, the usage of CAD-systems became the norm for variant designing for both new construction and reconstruction and repair of existing objects.

It could be mention, that analyzing and calculation of some designing variants have independent practical meaning, because specialist or specialists` group, that accept the final decision, have a possibility not only to choose the best variant but also to evaluate the possible realization consequences of any comparative alternatives on whole quantity of criteria.

Our time is dictating substantial requirements to architectural view of each city territory covered with buildings. Modern technologies develop thus much quickly, that almost all architectural creations have a chance to be realized. But all these creations should have not only beautiful external view, but also to be reliable at construction and operation. Thus, architects and constructors always work shoulder-to shoulder, protecting beauty and reliability of our cities. All these requirements are referred to such unique installations as stadiums and sport complexes.

Taking survey of famous world stadiums and sport complexes that have already exist or are just constructed, it could be found some types of structural coverings, forms of which are attractive for design`s authors. All of them have both advantages and disadvantages. All these structural decisions could be referred to truss, frame and structural systems, carried out by cantilever schemes. To these group also could be referred one of the variants of Luzhniki stadium that was proposed during design development. This decision of grandstands` roofing represents the cantilever roofing with external supports and intermediate supports in zone of spectator`s seats on grandstands (such decisions could be found in designs of some European stadiums). Putting attention on main

disadvantages of this roofing type, it could be distinguished the following: through the great length of cantilever roofing truss it is necessary to perform developed base for fastening the roofing`s bearing part to lower situated reinforced concrete structures. Intermediate support in zone of grandstands allows reducing the cantilever overhang, but such decision significantly reduces the viewing conditions for spectators and is not desirable from architectural-planning point of view.



а) *б)*

Fig.1. Luzhniki stadium view. a) general view; б) cantilever roofing with external supports

One more type of roofing – membrane shells. During design development in Luzhniky (the final decision of stadium`s roofing structure in view of ribbed dome with opening in central zone, with external and internal contour rings is shown on fig.1) was proposed some structure`s decisions: roofing in view of spherical, cylindrical, steel-concrete membranes. All variants have their own peculiarities. As usual membrane systems are weighed down, so disadvantages of this type are connected with pipe bend of raining water from the roofing, providing of roofing stabilization, necessity of significant increasing of internal contour for field viewing providing from upper rows of seats.

During first stages of shed roofing designing for NSC “Olimpiyskiy” also was developed and considered in detail some design decisions. But all variants are united by one principal decision – they have guy supporting system. Application of guy-suspended system, by preliminary calculations, gives a possibility on 20-25% decrease the metal expenditures on roofing. One of the most crucial and complicated stadium`s element is shed over the grandstands. Roofing of such area is referred, as a rule, to idea of unique complicated systems and is carried out from light metal structures. The shed is divided on three parts; membrane-fabric roofing, guy system and skeleton from 80-ty columns [1] (fig.2).

Shed structure corresponds to ring principle. Series of radial cable spans are situated between one internal strained ring and two circumferentially arranged strained rings.

Calculation of stadium structures was carried out with usage of modern software complexes. At calculation of suspended guy structures is reasonable to take into account geometrical linearity.

Stiff guys, for example, from rolling or welded section are modeled by geometrically non-linear bars.

At non-linear calculation instead of calculation on all loadings with further computation of design combination of efforts, is carried out calculation on given loading`s history of structure. So, looking for the most favorable efforts` combination for particular elements requires scheme calculation on several loadings` history.

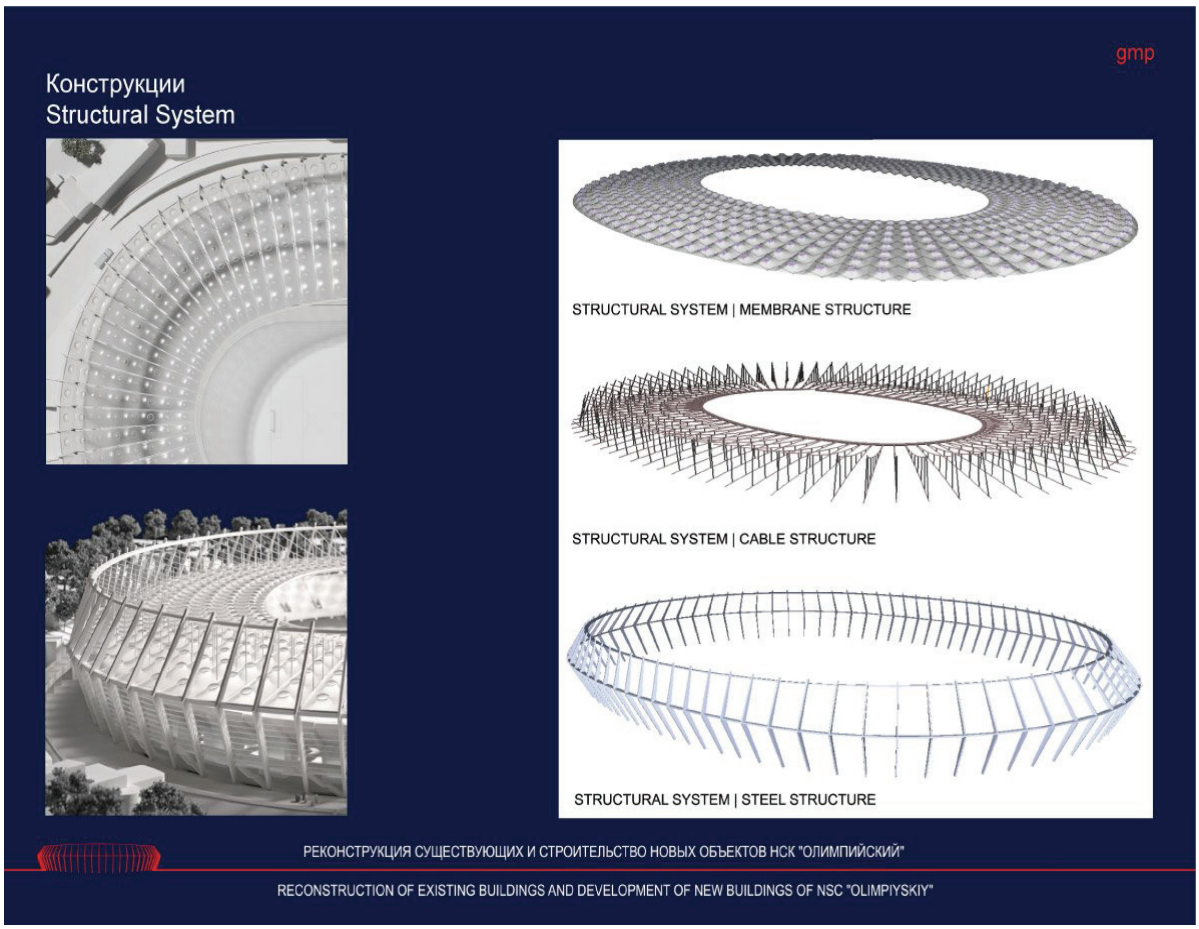


Fig.2. Roofing structure of NSC “Olimpiyskiy”

There are following main problems that arise at calculation of guy-structures with the help of FEM:

- numerical and practical realization of pre-stress;
- taking into account the influence of supporting contour`s stiffness on stress state of rope elements (supporting contour often is accepted as absolutely rigid);
- usage of curvilinear elements (threads are modeled by linear elements);
- expediency of calculation fulfillment on stability of supporting structures.

To take into account geometrical bar`s non-linearity is supposed that Hooke`s law is carried out ($\sigma x = E\varepsilon x$), and incoming into this expression deformation has the following view:

$$\varepsilon_x = \frac{du}{dx} + \frac{1}{2}\left[\left(\frac{du}{dx}\right)^2 + \left(\frac{dv}{dx}\right)^2 + \left(\frac{dw}{dx}\right)^2\right] - z\frac{d^2w}{dx^2} - y\frac{d^2w}{dx^2}$$

On each step takes place taking into account normal stresses at construction of rigidity matrix.

Structural system of the roof structure is related to the spokes wheel principle (fig.3):

A series of radial cable trusses span between one inner tension ring to two circumferential arranged compression rings, providing a shortcut of the required prestress forces.

The geometry is arranged in 80 system axes. Both compression rings are arranged in a constant level in height but following different curvature in plain view. The lower compression ring follows two different radii considering the geometrical boundary conditions of the existing grand stands but leading to very limited curvature along the grandstands in east and west. The upper compression ring undulates relative to the lower one showing a high offset in the curves in the north and south and a small offset in the long sides of the stadium in west and east. The shape is developed by means of an optimization process.

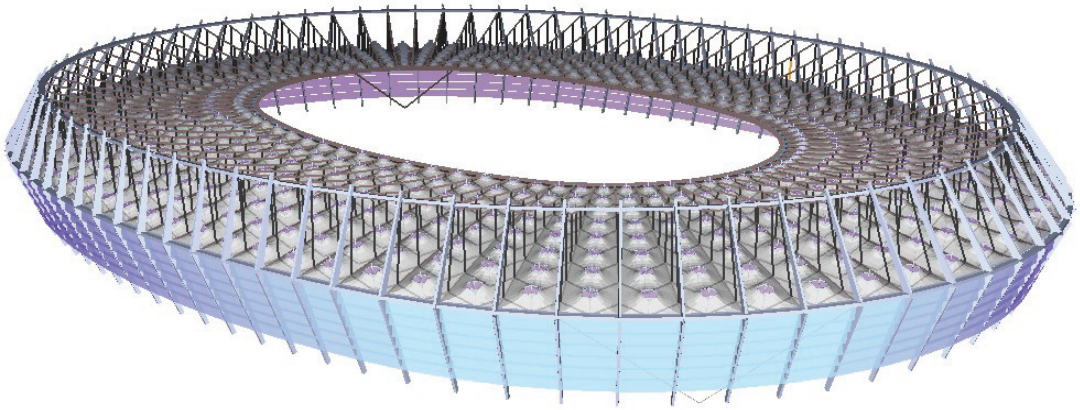


Fig.3. The general view of structural scheme

The cable structure will carry vertical downward loads (snow) by a decrease of stress in the lower radial cables LRC and an increase of stress in the upper radial cables URC and the tension ring TR. The additional tension forces of the upper radial cables URC are split in a vertical and horizontal component: The horizontal component is shortcut within the Upper Compression Ring UCR, the vertical component is carried by the Raking Columns RCol between the both Compression Rings. Due to the inclination of the columns this causes additional horizontal components being introduced into the two compression rings. Suction forces (wind) will be carried inversely.

Horizontal forces are mainly introduced through the façade and further caused by wind friction on the roof surface (due to the shape of the membrane structure showing a certain ‚roughness'). A further small part results of wind acting on the exposed steel structure. About 50% of the wind action onto the facade is transferred into the lower part of the columns and further to the foundations. The remaining forces are introduced into the spokes wheel system and transferred to the foundations by means of the façade columns acting like table legs being fixed at the upper end and pin connected to the foundations.

The radial cables are aligned following the 80 system axes. The tension Ring TR is more or less on a constant height level.

The pre-stress distribution and the geometry are well optimized to prevent any ponding due to rain, hail or snow, but also to avoid too high forces within the complete structure. The drainage of the roof to the perimeter is realized by the inclination of the lower radial cables LRC.

Loads are introduced into the supporting structure at the 80 column base points.

Conclusions. Creation of unique sport complex NSC "Olimpiyskiy" has shown the high professionalism of native school of design, reconstruction and construction of great span installations and has confirmed once more the ability of Ukrainian industry to create such designs.

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A.O. Beljatynskij, Doct. Tech. Sci., Prof.;
D.E. Prusov, Cand. Tech. Sci., Assoc. Prof.,
V.M. Badakh, Cand. Tech. Sci., Assoc. Prof.
National Aviation University

RECONSTRUCTION PRINCIPLES OF AIRPORTS COMPLEXES OBJECTS USING THE METHODOLOGY FOR BASES STABILITY MODELLING

The methodology for modelling and determining the strength of soil bases interacting with protective and buried structures in the over-limit state has been discussed. This methodology has been used in the reconstruction of airports complexes objects designed for operation in severe geotechnical conditions.

Definition of Problems

Reconstruction of airport complexes objects requires maximum use of space not only within towns and other settlements, but also within the boundaries of modern airport complexes, in the territories of which it is necessary to build modern terminals, undersoil structures and parkings, airsheds, new take-off runways, flying lines for heavy wide-body aircrafts, vehicles for servicing aircrafts, and other engineering structures.

In the process of reconstruction of airport complexes, there are certain problems associated with ensuring stability of the existing stressed-deformed state of supporting bases under the objects of airport complexes, specifically in areas with severe geotechnical conditions. The methodology for estimating the effect of severe geotechnical conditions on the stressed-deformed state of airport structures, with consideration for the limit state of the soil semispace balance, has been developed on the basis of the following criteria: the limit strength of airdrome pavement plates, maximum allowable elastic deflections of airdrome pavements, limit shearing strength of soil, and maximum allowable bending tension stress for monolithic layers of airdrome pavements. In this case, it is necessary to take into account combined multilayer natural pavements, artificial supporting bases, and soil bases when reducing the solution of the three-dimensional problem to the solution of the two-dimensional problem. In order to solve the assigned task, the simulation of effect of multiple-wheel undercarriages of modern heavy aircrafts was performed, by using numerical computation, with the reduction of actual load to the equivalent load on the take-off runaway, as is in the case of solution of the two-dimensional problem. In order to determine limit deformations of the whole design multilayer portion of the soil semispace, with consideration for the limit shearing strength of soil and allowable tension stresses in layers of the artificial base, the development of local plastic deformations was taken into account. On the basis of numerous experiments performed by using the method with fixed pattern of finite elements, recommendations with respect to correcting coefficients characterizing operating conditions were provided, which allowed the existing engineering analytical design methods to be used [1, 3].

The limit balance of soil within the elementary unit (finite element) being considered is equivalent to such a stressed state, at which even a minor additional effect can disturb the balance. This stressed state is characterized by that the shearing strength of soil within the elementary unit (finite element) should be equal to the limit shearing strength specified for the soil type. This state is defined as the limit soil state corresponding to the second phase of the limit soil states, which is possible at the intensive development of shearing deformations in the soil mass. In this case, the numerical solution of the problem of strength of soil masses is performed on the basis of the methods proposed in [4, 5, 6], with some corrections for the plastic yield criterion specified for the soil semispace.

Analysis of the Last Studies and Publications

The analysis of geotechnical conditions in Ukraine has been performed in order to determine their effect on the design decisions with respect to reconstruction of airport complexes, specifically

the decisions for implementing some protection facilities, such as special complex structures of airdrome pavements, water disposal systems, drainage systems, and other protective systems.

At the present time, the analysis of the aforesaid systems is possible only by using methods of numerical simulation, for which a modern computer base and corresponding mathematical tools are required. The complexity of solution of the corresponding problems consists not only in developing or using the corresponding computer software facilities but, first of all, in the necessity to accept a reasonable physical model which most correctly describes nonlinear processes characterizing deformations of surrounding materials, including deformation of soil material, as well as in the necessity to select design diagrams and special calculation algorithms which ensure the reliability of computation data. The situation is complicated by that that there is, at the present rime, no uniform method or model which is suitable for any geomaterial or environment.

The analysis of normative documents and scientific works of national and foreign scientists, which were published in industries allied to the construction industry, has shown the availability of large number of methods and scientific works for determining data on deformation and stressed-deformed states of structures. But the use of any individual method or scientific work does not provide the possibility to take into account the complexity of the soil layer structure if there are weak intermediate layers in the soil or if subsurface erosion or boiling are developing in the soil, as well as take into account the effect of these conditions on the stressed-deformed states of airdrome pavements, protective structures for strengthened soil masses, and understructures and foundations of airport buildings and structures. There is no normative base required for performing corresponding design calculations, and methods for analyzing the stressed-deformed states of airdrome pavements, with discrete simulation of the soil bases, are virtually not available.

The use of existing standards and empirical relationships for estimating the effect of new construction on existing structures results in unreasonable margin of safety or destruction of the existing structures. Additionally, the provision of reliability of buildings and the reduction of financial and material losses are of great importance at the present time.

Purpose of the Work and Definition of the Problem

In every case, the problem definition procedure should include the individual analysis of reliability of the data obtained in the process of the problem solution, as well as provide a special approach which requires from the designer not only to develop the design documentation properly but to have corresponding knowledge and skills in numerical simulation and soil engineering.

The development of a reliable design model of the soil base, which would ensure sufficient compliance of the design calculation results with the actual conditions, is one of the most important problems in construction. The existing methods of design calculations for soil bases, available according to the soil engineering, allow the problems only partially to be solved. The use of the limit value corresponding to the end point of the linear section of the characteristic of dependence of soil upsetting on loading, as a designed pressure value, results, as a rule, in the acceptance of not always economically effective solutions. A large part of studies of plastic deformations cannot be taken into account using the methods of the classical linear soil engineering. So, it is necessary to develop more advanced design calculation methods, which provide a possibility to take into account the actual pattern of loads acting on foundations, and the actual nonlinear properties of soil bases.

The current actual problem is to develop a mathematical model for calculating the strength of foundation piles for the purpose to increase the validity and reliability of design decisions by taking into account geometrical and physical nonlinearities of soil bases and dilatancy effects in soil bases, as well as to correct the criteria for estimating limit states of soils.

The process of construction of airdrome pavements also depends on the stability of the existing stressed-deformed state of the soil base under the pavement. In such conditions, protective engineering structures and technologies for constructing such structures, which would provide minimum changes in the stressed-deformed state of the soil base, are of great importance. The design analysis of protective structures, such as protective shields, diaphragms, retaining walls of different configurations, and walls in the soil made of built-in-place or drilled piles buried under 40 m or more of the soil, should be performed with consideration for the nonlinear properties of the

soil, specifically when stripping soil for deep excavations.

The use of existing standards and empirical relationships for estimating the effect of new construction on existing structures results in unreasonable margin of safety or destruction of the existing structures. Additionally, some existing building technologies, for example the technology with pile driving without soil excavation, are novel and not presented in normative documents.

The reliable and economically effective solution of any problem is possible by performing the analysis of interaction between the elements of the following systems: the existing building - protective structures - the excavation for the new building; the soil bases and foundations of the existing buildings - protective structures - surface-based structures as a whole; various combinations of interaction between the soil semispace under the existing buildings and protective structures between the existing buildings and the designed new buildings.

At the present time, the analysis of the aforesaid systems can be performed only by aids of numerical simulation, for which a modern computer base and mathematical tools are required. The complexity of solution of the corresponding problems consists not only in developing and using the corresponding computer software facilities but, first of all, in the necessity to accept a reasonable physical model which most correctly describes nonlinear processes characterizing deformations of surrounding materials, including deformation of soil material, as well as in the necessity to select design diagrams and special calculation algorithms which ensure the reliability of computation data. The situation is complicated by that that there is, at the present rime, no uniform method or model which is suitable for any geomaterial or environment.

In every case, the problem definition procedure should include the individual analysis of reliability of the results obtained in the problem solution, as well as provide a special approach which requires from the designer not only to develop the design documentation properly but to have corresponding knowledge and skills in numerical simulation and soil engineering.

The design of protective structures for new construction objects in areas with existing structures should be performed with consideration for the effect of various stages of construction on existing structures and adjacent soil masses, such as the stages for 1) installing protective structures and 2) constructing excavations with consideration for the effect of unloading of the soil base and for the sequence of installation of engineering structures.

In most cases, the reliable results of system simulation are possible due to the use of elasticity models based on the plastic flow theory. In this connection, it is important to take into account the design characteristics and nonuniformity of the construction process with respect to the accepted system.

The requirements for assurance of reliability of buildings and structures, as well as the requirements for reduction of financial and material losses, are very important at the present time. These requirements apply to soil bases and foundations as the most critical elements of engineering structures.

According to cost accounts, the expenses for reconstructing or strengthening foundations or for correcting design errors exceed many times over the initial cost of the foundations and, in some cases, the cost of the whole structure. Therefore, corrected design calculations for foundations and soil bases are of great importance at the present time. One of the optimal foundations is a pile foundation. Piles have high load-carrying capacity and ensure minimum foundation settlement. The objective causes for introducing pile foundations in Ukraine are the following: the existence of collapsible soils and the vital necessity to build multilevel industrial and civil building and structures for the purpose to preserve agricultural land. Notwithstanding the longstanding and wide use of pile foundations in housing, industrial, and civil construction, the characteristic features of the interaction of pile foundations with soil bases have been studied insufficiently, and at the present time, there are problems which are not solved in full.

In accordance with this scientific work, the methodology is developed which is designed for studying the interaction of enclosing and protective structures with the soil semispace in the over-limit state, with consideration for geometrical and physical nonlinearities at the stage of problem definition, in the conditions of complex loading of the soil base with consideration for active and

passive loading and the effect of unloading of the soil semispace. The methodology has been developed on the basis of the nonlinear soil mechanics theory, nonlinear elasticity and plasticity theory, nonlinear programming methods, and finite element method. New modified models have been proposed, which provide the possibility to account for nonuniformities and effect of anisotropic properties of the multilayer semispace in conditions without friction between the individual layers.

This scientific work is based on the use of the generalized functions of the soil mechanics, which provide the possibility to more correctly determine the values of the stressed-deformed state of airport structures that are in interaction with complex soil bases.

The basic tasks of the work are the following:

1. Developing a mathematical model for studying nonuniform soil semispaces;
2. Improving the mechanical model for analyzing the strength of soil semispaces;
3. Developing basic equations for determining the state and balance of complex systems with consideration for geometrical and physical nonlinearities at the stage of problem definition;
4. Developing a special algorithm for solving nonlinear equation systems;
5. Performing the numerical analysis for the purpose to confirm the validity of the results obtained;
6. Detecting conformity in the development of deformations in the structures of airdrome pavements and foundations of building and structures of airports with consideration for the nonuniformity of soil bases.

The study of interaction of soil bases with structures of airport objects is connected with the determination of the stressed-deformed state and strength of the soil mass, as well as with the determination of deformability and strength of the structures.

The methodology for design calculations of elastic soil semispaces, using one of the effective net methods, that is, the finite element method presented in the form of relationships which are characteristic for the fixed pattern of finite elements, at the stage of definition of the plane problem with respect to a nonlinearly deformed solid body, is analyzed with consideration for geometrical and physical nonlinearities. At the stage of problem definition, when simulating the soil semispace, the significant nonuniformity of intermediate soil layers is assumed. To estimate the stressed state of the soil semispace, it is necessary to compare the design calculation results with the maximum allowed deformations and displacements, because local areas with loss of strength and development of plastic deformations are possible.

The methodology for studying soil semispaces with the use of nonlinear elasticity theory provides the possibility to obtain reliable results in the solution of the plane problem of the soil mechanics with consideration for the nonuniformity of the soil semispace, availability of layers with different physical and mechanical characteristics, different boundary conditions, and random external effects. The use of this methodology ensures the sufficiently reliable description of stressed-deformed states of soil semispaces in interaction with the structures of airport objects, and provides the possibility to perform studies of stressed-deformed states of soil semispaces when solving actual problems with respect to design of airport objects in complex geotechnical conditions in Ukraine.

The characteristics of the dependence of the effect of nonuniform soil bases on stressed-deformed states of the aforesaid structures of airport objects have practical importance, and the estimation of the effect of nonuniform inclusions of rocks with different physical and mechanical properties in soil bases, as well as the determination of relationships required for estimating deformations of airdrome pavements and other objects of airport complexes located on soil bases, are considered as actual and important problems in the construction industry.

Conclusions

The developed methodology for simulating the strength of soil bases and estimating the effect of complex conditions on stressed-deformed states of structures when reconstructing airport complexes provides the possibility to perform the corrected design calculations of elements of

structures of airdrome pavements in conditions characterized by implementing the advanced technologies for exercising external influence on the soil semispace, as well as to perform the corrected design calculations of filling dams and transport road beds with consideration for multilayer reinforcing of these objects and in conditions with the development of limit plastic deformations. The methods for the numerical analysis of strength of airport objects, with consideration for the limit balance state of the soil semispace and the effect of the field of the airport ramp anisotropy of the multilayer space, were corrected by improving the mathematical model of strength of airdrome pavements, with consideration for the limit balance state of the soil semispace, and by developing algorithms for solving nonlinear equation systems using the combination of methods for extension of the numerical analysis methods depending on perturbation parameters and development of plastic deformations.

The numerical analysis results in the solutions of the problem of optimal design of reconstruction of airport complexes in compliance with the generalized design parameters. The results of the analysis of the stressed state of airdrome pavements with consideration for complex geotechnical, physical-and-mechanical, and hydrological features characterizing the structure of the soil column, obtained in performing, as an example, the procedure for strength analysis of the real structures of a rigid airdrome pavement using different discrete models and different types of soil bases, confirm the versatility of the proposed methodology for studying stressed-deformed states, and the possibility to define, on the basis of the methodology, the reconstruction principles of airports complex objects.

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M.V. Butyk (National Aviation University, Kyiv, Ukraine)

FEATURES INTEGRATED SECURITY AIR TERMINAL MEANS OF ARCHITECTURE

The article discusses the issue of a complex security architecture means of airports. Based on the recommendations of the regulations, modern building experiences architectural planning, design and engineering tools and recommendations have been made to protect against possible artificia, natural and social threats.

Every time after another emergency situation the security issues concerning airport building arise: they are being discussed, tried to understand the causes and conditions that had happened, looking for problems and health protection, people are starting to be interested in the experience of other countries in this region, often without going to the real action, and gradually forgetting about them up to the next incident. Moreover, even held immediately after the tragic events verifications indicate that the protection of buildings are not considered seriously: violation of fire safety rules, multiple inputs and outputs are not controlled, not working communications and warning services of employees are absent or do not work, and surveillance data are important only after the incident.

How can I avoid damage due to malfunction of equipment, human factors and make security more robust and permanent? Architecture plays primary role here: it is continuous in its impact on people, it can manage its traffic and protect against new threats. It creates the basic structure of a stable, slowly criss-crossing engineering services, communication lines and observation. The structure of this – the foundation of all kind of scene, which played out of action with a clear scenario for which the facility was provided. But if the basis of poorly coordinated and unreliable, it can not fix is nothing - that's why you need to pay attention to the comprehensive security at the design stage of the terminal.

The term "comprehensive security" given the following definition - is implemented in the design decisions agreed upon by the interaction of engineering systems (vehicles) and personnel involved in preventing unauthorized actions, the safety of people in emergency situations [2]. The definition above implies that the safety of people in the terminal may be provided by:

• rational design decisions of the object;

• rational engineering and technical means of protection facility, eliminating or reducing the effect of the expected threat;

• rational organizational measures.

In addressing these objectives, one of the main issues is how to evaluate "the expected threat," either a terrorist act, fire or explosions, the situation of the criminal nature or man-made disaster and non-support system object (which can also lead to loss of life) and other threats. Deciding complex security of the terminal all of these threats must be considered together and measures to protect the facility should also be addressed comprehensively.

In domestic and foreign regulations it is said about the importance of the issues of security at the stage of planning and design [1, 3]. For example, TR 205-09 "Technical Guidelines for the design of systems of anti-terrorist protection and integrated security buildings" introduces the concept of a physical barrier, critical points of the object and access levels, formulating basic recommendations for the design of architectural spaces safe, considering the desired state as harmonious operation of complex systems of engineering, architectural and social. Requirements for design decisions highlighted the need for control points are adjacent to the building site, as well as a hierarchical system of access and exclusion zones unauthorized passage from one zone to another. Property should be divided into zones controlled by the general and limited access to view the architectural concept of aerial parts and functional assignment of rooms and areas. In addition, the division and coordination of human need and streams that is in the air terminal. The importance of the division and control of human movements in them can be seen particularly strong as the need for coordination of There should be few entrances and exits, strictly controlled and separated for different streams of people - staff, passengers and accompanying persons. Path is possible to divide

the inner space of the building. Each route corresponds to the algorithm of human action, without the opportunity to deviate from it. Flows of people should be controlled, and of people in the terminal building monitored CCTV systems or security service. However difficult it may be, to avoid the accumulation of large numbers of people. Large spaces with an amorphous mass of people the most dangerous and vulnerable. The greater the likelihood of emergencies or other areas of the terminal, the more attention should be paid to creating a comprehensive system of protection. If we talk about developing a comprehensive protection system for existing airports, and those who are still at the design stage should consider the recommendations of ICAO "Doc 8973. Volume III. Airport Security (Issue 7)" and the requirements of the law "On comprehensive security" in stating that in the process of developing a systematic approach to the facility to ensure safety at all stages of the life cycle of the object. In general, the system approach provides:

1. The analysis object and expected threats.
2. Development of the concept of protection of expected threats.
3. The analysis developed the security and (if necessary) adjustment decisions.
4. Monitoring of protection in the operation of the object [2].

This approach will ensure the necessary level of protection and minimization of expanses for newly designed systems. Analysis of the object of protection is performed in order to identify the "critical point" effect which can change the system of protection and safety of the state as a whole. This should be considered:

- Space-planning decisions;
- The organizational structure, number of staff personnel, modes of operation;
- The processes and their impact on security;
- Vital centers of the object (communication and means of livelihood of the object);
- Features guide that affect the security mode;
- The current organization of the object.

Can architecture means to prevent disasters and reduce the likelihood of terrorist attacks? It may be as logical to anticipate security problems at the stage of project development, identifying the most vulnerabilities and protecting them.

Architecture and planning tools in the design of airports designated for crossing a large number of people used in the following areas:

- Protection against explosion;
- Create barriers to prevent trivial threats and delay;
- Architectural software alarms, improved lighting, surveillance cameras or cable television to guard or security service could notice and time to defuse the offender;
- Creation of architectural support for hardware protection, forming the image of a safe and secure space.

Equal protection of trivial criminal assault (vandalism, illegal entry, etc.) and protection against terrorist attacks are different means of security from various threats. Protecting the infrastructure of the building is provided subject to such requirements-planning organizations:

- The focus at the beginning of the design should be given the functional zoning. Separation zones of high and low risk and remote distance. Areas of high risk should not be public. Windows, doors, walls and floors of such zones should be more reliable.
- Traffic flows for which the airport is the center of gravity as possible should not mix and overlap. They may be diluted in different levels (Figure 1).
- Lobby, offices, waiting rooms and temporary storage, and other hazardous area must be physically isolated from the rest of the building. These are the types of spaces that can be attacked first. Should pay careful attention to the location of entrances for staff, passengers and accompanying, and if they merged, split these flows, minimizing thereby creating queues in disadvantaged areas.

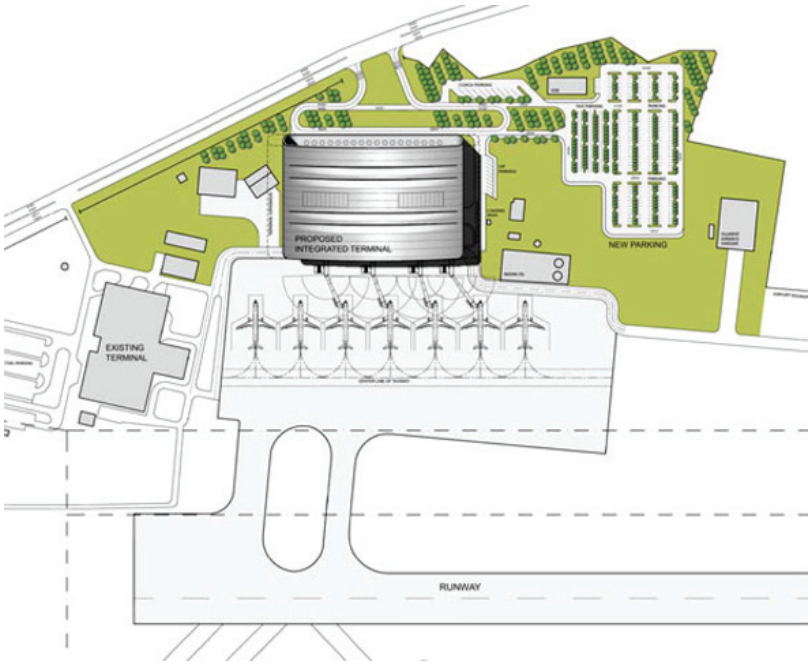

Figure 1. Vienna airport. The scheme of traffic.

- Lobby and lobby to be adapted for placement screening devices and areas of review staff and passengers. Sign phased do better. The first is uncontrolled access in lobby area with fast protection, then - because of technical devices passes - the entrance to the controlled area, leading to the landing site, etc.

- Wide internal space, the main halls and rooms most at risk. Their design should be done explosion and Fire protection, coating – easily dismounted reflection and scattering. With the destruction they should cause fragmentation wounds.

- Control by means of observation, which should make the point of observation posts guarding. Streams of people are to be separated so as not to create a crowd that can help multilevel and a translucent barriers deviation from the desired route.

- For airports especially important to separate streams of arriving and departuring, separated from the transit routes for waiting, long term and short-term parking (Figure 2). Linear organization of the major space prevents the creation of the crowd. Large and amorphous can be places of rest and waiting passengers, but the entrance they should be controlled, and interior space - always be supervised.

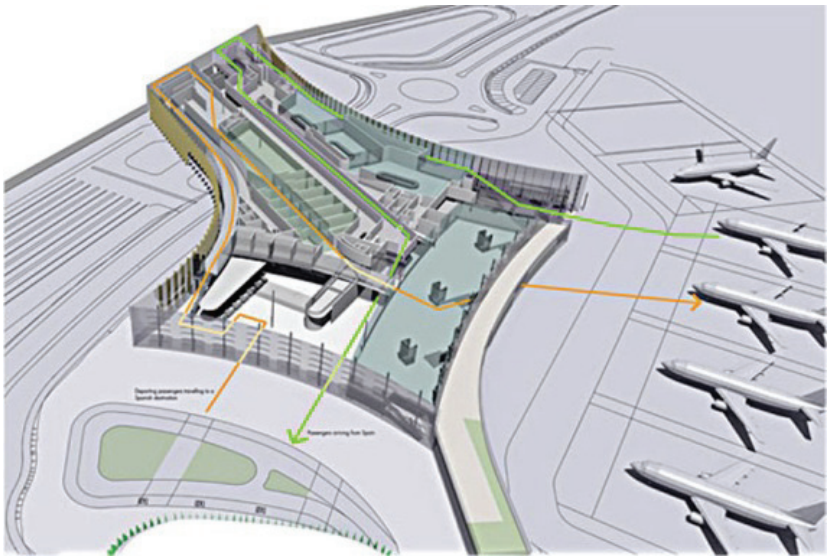

Figure 2. Gibraltar airport. Aksonometry

- Facade may be several options for security. First of all external construction should be resistant to negative impacts.

- Attention to support system building: heating, plumbing, ventilation and air conditioning. Most of these critical systems located in the input area on the roof, in commercial areas, but they must equally be protected from unauthorized access.

- All hazardous area must be clearly identified and isolated from the constant traffic of employees and visitors. All facilities and infrastructure of the building shall be equipped with their own means of protection to maintain a safe environment for employees. Access to the resources of the building should be limited and controlled observation.

Conclusions

Consideration of the problems of integrated security terminal makes it possible to link normative, organizational, technical and financial components of a comprehensive security architecture means both existing and newly created objects will only be entered into operation, will improve the activity in the prevention and suppression of shares terrorism and other threats. Architecture plays a primary role here: it is continuous in its impact on people, can control its movement and to protect against possible threats, create a stable base structure.

Analysis of the above requirements-planning of airports and the definition of "critical points" effect which can change the system of protection and safety of the state as a whole, we aim to further improve the study of theoretical and technical means of security and development of methods for complex protection of terminal facilities architecture.

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UDC 72.01

G.I. Bolotov, Candidate of Architecture, Associate Professor (NAU, Kyiv, Ukraine)
M.N. Timoshenko, Candidate of Architecture, Associate Professor (NAU, Kyiv, Ukraine)

SOURCES OF DEVELOPMENT OF AVIATION BASES IN UKRAINE. PERSONALITIES AND MEMORABLE PLACES

The article is devoted the problem of determination, maintainance and celebration in honour of birth-places and inventor activity of creators of world aviation, on the walks of life of Ukraine.

Ukraine is like a loving mother, despite of very difficult historical fate and everyday problems, has always supported and cared her sons, especially those who wanted to raise mankind to the wing.

Recognizing a man as the high value of the system evolution of the Universe, our ingenious countryman philosopher Volodymyr Vernadsky (1843–1945) wrote in the main work of his life "Scientific thought as a planetary phenomenon" (1943): "We can see as a permanent one and the same discovery the same idea again emerging in different parts of the globe, in different ages, without any possibility of borrowing". This little essay is written for the purpose of verification of this thought.

If we watch the map of Ukraine, on which marked the places of birth, creativity, eminent personalities of aviation thought and practice: the first aviators, engineers, pilots, makers of aircraft for the Earth atmosphere and space, then a large number and dispersion of the local aerie of the luminaries, pioneers, founders of aviation in Ukraine. These cities, towns and villages: Kyiv, Zhytomyr, Poltava, Kharkiv, Odessa, Feodosia, Yalta, Voronovytsi, Chervone and others. At these places as famous aviators of the XIX–XX centuries as V. Vernadskiy, O. Mozhaiskiy, I. Sikorskiy, P. Nesterov, F. Tereshchenko, S. Utochkin, K. Artseulov, S. Korolov, O. Antonov and others were born and created.

If you follow the ways of life of these people, the creators of world-class aviation, we can mark their close relationship with the people, culture, high level of civilization in Ukraine, which corresponded at the same time with simultaneous efforts of humanity in the implementation of the global industrial revolution.

Alexander F. Mozhaiskiy (1825–1890) is the descendant of the Russian Navy Admiral family after 35-years experience of the marine life circus the age of 40 years, began to work for the dream of all his life, the creation of aircraft that would be heavier than air. During all the years of service in Navy he perfected his design, which he conceived in 1876. At the same time Du Temple, Kliment Ader and Samuel Henson in France were worked of construction of vapour-planes. October of 1890, when took off Ader's vapour-plane, is adopted as the beginning of aviation era. We read in the monograph by N.V. Spitsyn " Ballooning in 100 years " (1884): " Mozhaisky aeronautic shell is one of the first in the world that was build in real sizes and and separated from the land person on board". This famous event took place on the estate in Mozhaisky Voronovytsi (Podillya). The manor, the park, the palace with 45 rooms (2500 m^2) are preserved to our times. The paintings are preserved that Alexander Mozhaisky drew. The most valuable monument manor culture has two outhouses: avia workshope where Mozhaisky created kites, in which he flew and then vaporplane for the eight years in Voronovytsi.

Alexander Mozhaisky attituded tremulously to this manor, which belonged to the right of inheritance to his juvenile nephew, whom guardian he was. He did not sale, did not hypothecate this manor even when he needed money to build a "flying vapour-train" when he sold all his possessions, and sold the marriage ring, and even the uniform of flag officer. The genius of Mozhaisky, pioneer of aeronautics is that all the inventors were using natural ornithological counterparts before him, and Mozhaisky went the other way of creation of flying mechanical devices.

Our generation, when the independence of Ukraine has allowed review and evaluate the

contribution of the sons of aristocratic families, the national elite to the world aviation, must reconstruct Mozhayskiys' aerie.

And the U.S.A. president still is flying in helicopter that designed by our compatriot – kiever Ihor Ivanovych Sikorskyi (1889–1972). He was born in a large family of a doctor and a noblewoman on the corner of Ivan Franko and Yaroslaviv Val streets. He made his first helicopter at the age of twelve in this estate, in the workshops in the park. Ihor Sikorskiy has received the encyclopaedic education, played on the piano virtuosily, was fond of theater and visual arts and that has played a fateful role in his life and work.

Sikorskiy had leaved Petersburg Cadet Corps, in the age of twenty he visited to Paris and worked with Louis Blerio on a flying machine and with him flew over the La Manche in June 1909. He returned to Russia in 1911 and received a diploma of pilot. He created and flew on giant airplanes "Vityaz", "Ilya Muromets", set world record in speed when flew from St. Petersburg to Kyiv. He made PR flights and promoted aviation. The first woman in the world, a sister of Sikorskiy, has flew with him in 1912 on the sky. He has received the prizes of the competitions in military aircraft. All Kyiv were thrilled. The First World War and the Revolution began. Ihor Sikorskiy flew through Arkhangelsk to London and Paris in February 1918 and in March, with a small amount of money, emigrated to the United States. This is where fate leaded him, a music fan, to the concert of Sergei Rachmaninoff. The composer made a donation to the restructuring of roost on air workshop, but also allowed his name as a brand "Rachmaninoff Aero engeneering corporation". Superior intelligence, kindness, laid in childhood, allowed Ihor to become not only the president of a successful company, but also to rally round himself the fellows like minded people, to create a family of four sons.

15 types of aircraft was created in the Sikorskiy's company to 1939. In this year he has returned to his childhood dreams of Kyiv, to the creation of helicopters "Vought – Sikorsky". Still all around the world civilian and military helicopters with single screw and automatic bias circuit fly.

Ihor descendants came to Kyiv, visited Kyiv aviation institute, went to the yard of theparental homestead, where the blind childhood home of our famous countryman looks at them by walled windows. The outbuilding in the yard of number of 15 needs our protection.

Ukrainian land cherished in its aeries many talented, multi-faceted genius. So many extraordinary things, so many mysteries in the life of this man, that in this brief essay we can not open even hundredth part of his achievements and sufferings. His name was Alexander Shamray, but he hided himself under pseudonym "Yuri Kondratyuk". He lived a life of exile. His name written in gold in the hall of fame space museum in Alamahordi and a creater on one side of the Moon has his name.

His mother was the teacher of Kyiv-Pechersk school. She was from the family of Von Schlippenbach, her name was Ludmila Shamray. Fleeing the Bolshevik repression, as the royal army officer, he received the pseudonym of Yuri Kondratyuk. He has graduated with a silver medal in 1916 in Poltava gymnasium and entered the Petersburg University, and in 1918 became an officer of the Russian army, then a white officer and therefore was forced to change name and patronymic.

In 1925–26 Kondratyuk was working on Krylovskiy elevator, ending the book " The conquest of interplanetary space ", which became the main scientific work of his life and direction for the space exploration in the world. The author created the theory of intermediate space stations (missile bases) in the form of satellites, the theory of these issues. Calculations of Y. Kondratyuk were used by americans in the creation of the programs of the development of the Moon. Regardless of K. Tsiolkovskiy he developed problems of aerodynamics, brought fundamental equation of rocket flight, presented his theory of multistage rockets, and most importantly, has offered to provide solar fuel rockets.

In times of global crisis in 1927 in Novosibirsk the Ukrainian genius built the famous elevator "Mastodon" by 13 tons, built of wood without any nails. Vision of the genius clearly seen in the ability to think strategically, globally, foresee future energy crisis of XXI century and the need to

switch to alternative energy sources. He designed in collaboration with P. Horchakov and M. Nikitin powerful wind farm to the Crimea.

He volunteered to the front, where died in 1942. The mankind only now comprehends and uses his ideas. His aerie Poltava appreciated merits of its fellow: Poltava Space Museum has his name, his monument is installed in Komsomolsk.

Cohort included the name of the famous Odessa pilot Sergey Isaevich Utochkin (1876–1916). The first aviator of Odessa, versatile athlete in the early twentieth century was the consummate pilot, who made over 150 flights to 70 cities in Russia. Born in Odessa in the family of a merchant. His childhood was harsh, adolescence was full of enthusiasm in different sports, especially bike and motorcycling, ocean yacht racing attracted his. He attached to his car the wings and tried to fly. First the flight of Sergei Utochkin was made in 1901, on the balloon over Odessa with Josef J. Drevnytsky. He began to build his private plane in 1902. He flew to Egypt on balloon. He was leaving Egypt for Paris to learn piloting by Wright and Blerio. He returned to his native Odessa with a desire to build an airplane. The first pilot, which in the Russian Empire rose in the sky, was M. Yefimov on the French device and the second, in March 1910, became Sergei Utochkin. By the end of the year a pilot group included 30 people. Utochkin became pilot tester, set the records, received prizes and awards, his flights were national public holidays.

The life of the falcon of aircraft ended tragically in 1916 in a psychiatric hospital. He was buried in St. Petersburg. His merit is the popularizing of the art of piloting, he aroused among young interest in aviation, inspiring to transform the military aviation into civil.

The monument with inscription 'Кумир Одессы, воздухоплаватель и мечтатель Сергей Уточкин" stays at Derybasivska street in Odessa on the steps of his house. His name is given to streets and squares.

Kyiv of the late nineteenth and early twentieth centuries rightly considered a center of aviation. There was Aeronautics Company, its head was the student of M. Zhukovsky professor of KPI M. Delaunay. G. Adler, F. Aner, D. G., K. Kalinin, O. Karpeka, three brothers Kasyanenko, O. Kudashev, P. Nesterov, I. Sikorsky, F. Tereshchenko began their pilot activities in the city on the Dnieper.

House number 5 was remained in Pechers'k, at the Moscows'ka street. In this hous the family of the famous pilot Petro Mykolayovych Nesterov (1887–1914) lived, on the hous's wall the memorial plaque is posted. An elite of society meeted together in this house, there were discussions about aviation, discussions about literature, theater, music was heard from the gramophone. In Kyiv Syretsky airport Petro Nesterov with G.M. Neklyudov worked on the creation of his plane without a vertical plumage. He made at the Moscow plane "Newport – IV» his famous "loop" for the first time in the world. And in 1914 he together with his mechanic S. Rudenko flew to Odessa, Sevastopol, Moscow, St. Petersburg. Kyiv Governor presented him the golden token with which Mr. Nesterov did not part until his death. And he met his death in the Western Ukraine in 1914, during I World War near the village of Vola-Volots'ka, he shooting down with battering ram "back again" the plane of Austrian baron-pilot. There were not parachutes at that time – four pilots were dead. He was posthumously awarded the Order of St. George of IV degree. His children Margaret and Petro grew up in Kyiv. His remains was moved from Askoldova Mohyla to the cemetery of Lukianivka in 1939, where tombstone was found on the money of O. K. Antonov.

Fedir Tereshchenko from the family of famous oligarchs, that came from Hlukhov on Slobozhanshchyna, was the member of the Kyiv Society of Aeronautics, which was headed by Nestrerov. He studied at the Faculty of Mechanical of KPI, admired the construction of aircraft. In 1909 the family acquired the estate in Chervone village on Podill'a. Tsar Nicholas II visited this estate to learn the experience of building of the vehicles for aeronautics in the workshops of Tereshchenko for military purposes. Here in the heart of Ukraine in 1916–1917 aircraft series 1.7 "Tereshchenko" were constructed and flown. Fedir Tereshchenko has received a number of global patents, personally led the aircraft. To our days the palace, the park, the avia workshops are preserved in Chervone. And strange it seems that these monuments of our culture moved to the Moscow Patriarchate and nunnery is creating in the estate.

The pilot Kostyantyn Kostyantynovych Artseulov (1891–1980) was the member of the Kyiv Society of Aeronautics. He was born in Yalta in the family of an engineer-shipbuilder, he studied drawing, graduated from St. Petersburg Marine Corps, Kacza aviation military school, received the title of a military pilot. In the summer of 1916 at Kacza airport "mad ensign" first took shape of prohibited dangerous aerobatics – "spin" three times. He became a glider pilot, tested aircraft, was the first pilot of civil aircraft in aerial photography from 1927 to 1933 under the Soviet government. At the same time, this multi-faceted personality attended so glorious high art as book design, was a member of the Artists' Union. He Survived the exile and died in 1980.

Oleh Kostyantynovych Antonov (1906–1984) was born in Troitsy village in Podilskyi district in the family of an engineer. He made his first glider in the children's club, took part in Koktebel gliding competitions, received high awards. In the 24 years he has headed the design bureau in Tushynskiy airport, then headed the Novosibirsk branch of A. K. Yakovl'ev. Since 1952 he worked first in GCOKB-473, then in Kyiv mechanical factory, which was renamed OKB of the name of O. K. Antonova after his death in 1984. Gliders, multi-transport and passenger planes, including AN-2, AN-22 Antaeus, AN-122 Ruslan were created with the guidance of Antonov. Some of them constructes and operates today. The State noted its high merit by many awards.

Over 30 years Oleh Antonov lived in Kyiv, but memotial places must be more significant and have more architectural expression; in the Museum of NAU students and visitors should be able to see his personal things, paintings, sketches and drawings. While descendants are living – it must be done!

Serhiy Pavlovych Korol'ov (1906–1966) started his life in same year that Antonov in the Zhytomyr region in the family of the teachers. In the age of three he lived in Nizhyn, and in 1914 the family moved to Kyiv. He received two diplomas: one in Germany and one in the KPI, as well as diploma of Odessa profschool. In 17 years he has received a diploma for the project of glider K-5. In 1926 Serhiy Korol'ov entered and successfully finished the aeromechanical faculty of Bauman Institute (Moscow), he was the student of A. Tupol'ev. It is very hard work in the business aircraft building. Since 1931, he worked with F. Tsander. In 1937 he became the head of the office of missile devices, ...and then exile at Kolyma was. He as the designer has gone from glider aircraft to missiles. He was a world-class organizer, since 1946 he was appointed chief designer in NDI KB (Ballistic Missile Institute). In October of 1957 mankind applauded to the message about the withdrawal to the orbit of the artificial satellite of the earth of this KB, and in 1961 – Haharin's flight. He died still quite young in 1966 in Moscow.

Conclusion

Ukraine is proud of his son, his merits are marked by descendants: he was buried in the Kremlin walls, his monuments adorn cities, there is his museum in Zhytomyr, many streets, schools have his name.

This short essay does not allow adequately and fully reveal the depth, talent, global significance, hastorical heritage and value of Ukrainian aeries of the knights of world aviation and most accurate expression is phrasing from academic Volodymyr Vernadsky's diary: «You know, as dear Ukraine me and as deeply the Ukrainian revival gets to my national and own world view... I believe in the future.» (1945).

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D.M. Ilchenko (National Aviation University, Kyiv)

PRINCIPLES OF FUNCTION-PLANNING ORGANIZATION OF THE URBAN GREENING SYSTEM (on an example of the cities of Donbass)

Abstract: in article is devoted to definition of principles of the organization of urban greening system, which is carried out at the expense of functional use of the broken territories in their planning structures.

Problem. Complicated urban and environmental conditions of the cities of Donbass, including the presence of large areas damaged areas of industrial activities that require ordering and returning to economic activity, determine the relevance of research.

Based on analysis of factors influencing the formation and development of the urban greening systems of Donbass revealed that the activities of their organizations based on the use of the urban disturbed territories are of particular importance:

−existence of direct connections between elements of system of the urban greening systems for territorial and compositional unity, continuous placement in function-planning structure of the city;

−an attractiveness and a high potential of the city planning of a broken territory, which is selected by an element of the urban greening systems;

−need of decrease in ecological tension for Donetsk and Lugansk regions;

−preservations of an original image of the cities of Donbass which developed on the basis of the coal-mining industry;

−compliance to modern social and economic conditions, using the latest scientific, technical, architectural and artistic and technical achievements.

Purpose of the article. To define principles of the organization of the urban greening systems of Donbass based on a functional use of the broken territories in their planning structures.

Review of the literature. An experience of use of the restored broken territories as a part of the urban greening systems as objects of recreational appointment is presented in [1, 4], modern approaches to the principles and methods of forming the urban greening systems, including those that developed on the basis of coal-mining and processing industry are presented in [5, 6, 7].

Main part. Taking into account results of research of the domestic and the foreign experience [3] certain requirements to the organization of the urban greening systems of Donbass [2], the general principles of their formation, which occurs at the expense of inclusion of the broken territories are defined:

−principle of a spatial unity;

−principle of a functional ecology;

−principle of a historical identity;

−principle of an investment attractiveness.

The principle of a spatial unity is to create a complete and a complex of the urban greening systems, which consists of independent elements of structure with a network of internal interrelations, that provides full implementation of main functions to improve the health of an urban climate and a recreation in the selected area in particular.

The principle is directed on an identification and a compensation of missing elements in structure of the urban greening systems, due to what is a restoration of its architectural-planning and ecological functions, formation of new type (or improve of qualities existing) of the urban greening systems, improvement of an artistic image and its decorative features.

The principle of spatial unity minimizes gaps between objects of a recreation and its visitors.

The principle of functional ecological environment based on the contention that the urban greening system is the basis of the ecological framework. According to this – the correct and the complex approach to its formation will create the favorable conditions for the improvement of an ecological condition of the cities of Donbass. Such conditions develop on a basis:

−high qualitative and quantitative indicators of the urban greening systems;

–formation environment protection landscaping;

–conclusion of the broken territories, with their negative environmental impact, from a category "inconvenient" and their transfer to the structural elements of the urban greening systems.

The principle of functional ecology is characterized by numerous directions of use of the broken territories in structure of the urban greening systems. Analysis of the experience of the organization of elements of the urban greening systems on the broken territories testifies that the most popular direction of their use remains recreational. And possibilities of a creation of the objects of a recreation in territories with a special relief allow to satisfy requirements of the population for vacation spots with various functional loadings.

From the ecological point of view reclamation the broken territory allows to eliminate a number of the factors negatively influencing environment: a chemical, a bacteriological, a radioactive and other kinds of pollution of soils, ground waters; erosive processes, the karstic phenomena, the mudflows, the flooding. The reclamation provides and controls the suitability of environment for living, expressed in its physical, hygiene and climatic parameters. The principle of functional ecology is also directed on creation of a comfortable microclimate of the cities and decrease an aggressive character of a natural-climatic conditions of the Donbass.

The principle of the historical identification demands the accounting of specific conditions of development of the urban greening systems and directed on the identification and preservation of its regional characteristics. For example, identity of the Donbass is shown in the "man-made mountains" – heaps, which are at the level of visual silhouettes, panoramas and perspectives of the city mostly take dominating positions.

Accounting for a principle of the historical identification at formation of the urban greening systems of the Donbass means that the broken territories, which are reserved for its structural elements, should at the organization on them recreational zones undergo the minimum changes in the appearance. That is landscape-composition and architectural-planning methods should be directed on creation of comfortable and safe conditions of human habitation in the territory, which was broken, and not to turn it into a normal area in the standard sense. It is advisable to include in the urban greening systems those broken territory which should be retained as a special type of monuments and local sights. So, for example, can be kept with necessary preparation it is superfluous the humidified territories as natural reserves, specialized wildlife areas in the areas experiencing a modern tectonic precipitation, getting under progressing flooding from adjacent territories.

The principle of the investment appeal consists in creation of an economical and a legal base for attraction from potential tenants squares of the green areas for their development in recreational and health-building aspect. Purposeful search of the investment resources, introduction of effective instruments of investment, development of the balanced investment program and ensuring its realization is necessary for ensuring its realization.

In the urban greening system different structural elements which it is possible to call potential objects of investments, possess various investment appeal. Increase of the investment appeal will allow accelerating process of the attraction of investments. Potential appeal of territories in the urban greening systems is determined by their investment potential, which in turn is equal to the amount of town-planning, recreational and environmental potential.

The town-planning potential of the territory is expressed in its planning placement relatively: the historic core, central, middle and peripheral parts of the city, places of residence, work, leisure, main transport highways and pathways.

The recreational potential of the territory depends on the variety of features recreation facility, providing demand different social and age groups of the population, number of visitors recreation facility (counting on specifically set period).

The ecological potential of the territory defined by indicators of ecological situation of the city (district), aeration and insolation conditions of the area in which borders it takes place.

It is offered to use a scale of a rating assessment where high points receive territories at determination of each potential:

–placed in the central parts of the cities, directly in the historic core or area characterized by high demand for rental and sale of residential and commercial and office property, near the

administrative and the business center;

–provided with convenient entrances and foot ways, engineering communications;

–multipurpose recreation facility, focused on the needs of different age and social groups of the population;

–recreational objects of daily using with the maximum allowable number of visitors;

–the most remote from sources of ecologically adverse effect – industrial enterprises, streets with an intensive transport stream that provides low level of air pollution, gas contamination, dust content;

–rationally organized with optimal conditions of insolation and ventilation.

The lowest points receive territories:

–located on the periphery of the city,

–the most remote from the places of residence, work, leisure activities;

–limited opportunities in the organization of entrances and approaches of engineering communications;

–most approached to sources of ecological pollution;

–irrationally organized with complicated conditions of insolation and aeration.

To attract investment to the formation of the urban greening systems of Donbass development of their individual structural elements need to develop an investment strategy that should be introduced the legal measures to encourage potential investors when renting an unattractive in the investment aspect of the territories. It can be: side benefits, decrease in taxes or financial support at the first stage of creation the new elements of the urban greening system on the broken territories.

By a principle of investment appeal the broken territories to be included in the structure of the urban greening system must be economically and technically expedient from a payback position during (conditionally) short time.

Conclusions

For successful implementation of main functions (architectural-planning and ecological) the urban greening system should correspond to the basic principles of formation, namely: the principle of spatial unity, functional ecology, historical identity, investment appeal. Parameters of the city space should be put in a basis of typology of receptions of a formation of the urban greening system: its functionality, character development, the degree of transformation and artificial components of the urban environment, providing stability of greenery in difficult ecological conditions of the cities of Donbass, balance of the built-up and free areas from building.

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O.V. Kardash , doct. t.s., O.V. Nosyla, master (National Aviation University, Ukraine)

DESIGN OF INDUSTRIAL FACILITIES SUPPORT TENT SERVICE AIRPORTS

The requirements for design of industrial facilities awning. The advantages and disadvantages of frame-tent structures. The technique of sutures and studies of the tent material. The possibility of making tent covers without adhesive joints combined. A method of manufacturing a qualitative prediction of tent covers.

Statement of the problem Aircraft is a complex technical devices that require special storage conditions. From the smooth functioning of all components of the aircraft depends on the life of the crew and passengers of the aircraft. Storage of this equipment is in precipitation, exposure to adverse temperatures, the negative impact of climate (dust storms, blizzards) or biological factors. Therefore, storage of aircraft is a complex multiobjective task, which is based on a necessary aspect of conservation in working condition all the nodes of these complex machines.

An analysis of recent research and publications. To enable the storage of equipment used by industrial facilities, airports owned subsidiary services: warehousing, storage space for aircraft, its diagnosis and repair. They are usually fixed - capital structure, requiring significant investment of time for construction and permanent space, which prevents one of the most important indicators - use of cell area. A necessary condition for modern design approach to the problem is the need to determine the conditions and requirements for mobile facilities for accommodation, storage of aircraft equipment and operation of such facilities. These requirements must be systemic, multi-factor that determines the relationship, in which reliability, and forecasts are of paramount importance, as well as the variability of invariance of objects [1].

The main part Of the solution of the problem was made possible by a frame-covered structures (tent space, hangars), which used modern materials and technology. Table 1 shows the stated requirements to the design of tent structures, and the necessary parameters.

Table 1

Basic requirements for the design of tent structures

Number	Requirements	Indicators
1	functional	mobility
2	aesthetic	attractiveness
3	ergonomic	comfort
4	operational	variability
5	economic	profitability
6	production	transformation
7	reliability	life

The use of modern materials and a special, design, the approach allows for optimal storage of aircraft, regardless of climate and other factors. This is definitely a positive impact on the safety performance of aircraft and helicopters. These types of structures can be used to pre-training machines, technical inspection, certification and upgrading some components of aircraft. Under the protection of mobile hangar can be prompt and periodic maintenance of equipment. In case of

failure - the presence of mobile hangar will as quickly as possible to recover the aircraft. To create a comfortable environment, framed tent structures can be equipped with ventilation systems and heating systems, which allow to specify the optimal conditions for the safety of machines and working professionals. Can be used recuperative air heating system in conjunction with radiant ceiling panels. Among their advantages are: quick assembly and installation in any environment, light weight constructions (metal frame, tilt), mobility and easy disassembly, resistance to atmospheric precipitation, the ability to create heat in the room and indoor lighting, aesthetic appearance. The main types of prefabricated tent hangars are: polygonal, with vertical walls, arched (Fig. 1). Figure 1 shows the seams on the awning cover, allowing to carry out the transformation of the premises.

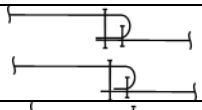
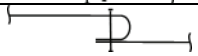
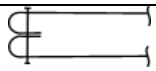
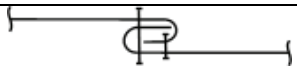
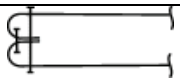
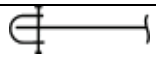
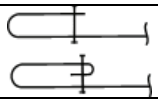
Figure 1 hangar arch type

Awning cover of a special fabric with PVC film (PVC - based on cotton, silk): single - only the outer layer, double layer - from the outer layer and inner (in this type of coating is formed layer of air, trapping heat inside the room), three-layer, insulated - from the outer and inner layers, between which is placed insulation thickness up to 50mm (used in severe climatic region). Size of frame-tent hangars may vary depending on the size of airplanes or helicopters. At the same time in the processing of polymers containing fluorine, the life of the hangar increases to 25 years. In general, the width of the awning frame-storage building is limited to 40 meters in length may also be either due to the possibility of transformation of the tent cover. High-quality PVC fabric can withstand a severe winter frosts and summer heat. This material is resistant to snowfall, and the sharp gusts of wind. Used materials and advanced technologies make it possible to obtain thermal insulation coatings tent, comparable to the characteristics of permanent buildings (R-4, R-5), at a cost several times less. In addition to skeletal structures as protection of individual components of airplanes and helicopters can be used in special tents. Typically, they cover the cockpit during storage of aircraft in hangars. In fact, it covers, created from materials that can effectively deal with the penetration of moisture, unfavorable temperatures. Cases are used to protect aircraft and units from the adverse effects of precipitation, dust and mechanical damage during parking. Protective covers are made of canvas tent (severe fabric of cotton, trimmed with COMP and BS-FT1) in a form appropriate parts of the helicopter (aircraft) and aggregates, and edged with lace. The main advantage is that the fabric is environmentally friendly, since it consists of 100% natural cotton, has a high water absorption and air permeability, high density, a water-repellent finish. Through the use of twisted yarn in the manufacture of tissue, greatly increasing the strength characteristics: abrasion resistance and tensile loads, low shrinkage (longitudinal or transverse contraction after wet-heat treatment) that determines the durability of products. It is also possible to use a wide range of colors and that is also essential - the material is not toxic under external influences. It should be noted that

the assessment of the reliability of connections tent covering material has not yet been conducted, but the method is missing. There is also no information about the varieties of stitches used, technical guidelines for the choice of their parameters. Therefore, for the implementation of predictive capability in the design process we have carried out the study. Table 2 lists the types of joints, which can be used in the manufacture of tent covers, cases and similar products.

Table 2

Types of joints, which are used for making tent covers

Stachnye seams	The design of joint	The appointment, particularly manufacturing
1	2	3
1		Sewing. Stitch width of 10 mm.
2		Allowance 5-7 mm.
3		Implementation of the connecting joints increase in productivity
4		
5		Treatment of boundary sections.
6		Connection details
7		Grinding with the finishing line
8		Treatment of slices details
9		With a closed or open cut

By the application of sutures is reliability - resistance to penetration of water into the seam. Perhaps the use of combined joints that use adhesive pads along the seam. However, this increases the cost of production and complicates the process. Therefore, a study to determine the feasibility of manufacturing joints without adhesive pads. To study the samples were prepared joints - 3, made of materials, "Rein-light" (Italy) film-coated, «HELLY TEX» (Italy) film-coated, "cuprates" (Italy) uncoated and «G-1000" s coated in three layers with a frequency of 3 and 4, 10.0 mm stitch row (respectively, stitch length 2.5 mm, 3.0 mm and 3.5 mm). Welds are made on the sewing machine with two needles "TYPISAL» GC 6170 with upper and lower transport, thread «Gutermann».

In order to select the sound frequency in the line of stitches investigated the strength of joints, respectively, GOST 28073-89 on the dynamometer Pendulum RT-250-M. The gap was determined at the time of suture thread suture rupture or rupture of the material on the seam line. Strength values ??were determined at the application of discontinuous force perpendicular to the seam on samples cut to warp and along the seam on the samples, a cut at an angle of 45 ° to the thread base. The research results are presented in Table 3.

Table 3

Results of research strength joints

Name of fabrics, raw materials composition,%	Needle number	Number thread	Stitch length L, mm	Breaking strength, N		Elongation at the time break,%	
				perpendicular to the seam	Along the seam	perpendicular to the seam	Along the seam
"Rhine-light" (Italy) 100% PE	90	70	2,5	44,0	11,8	34,4	18,0
			3,0	56,2	19,2	36,3	26,5
			3,5	61,0	19,8	38,8	32,9
«G-1000» 100% PE	85	60	2,5	36,2	15,2	18,2	17,0
			3,0	51,3	17,6	23,1	22,3
			3,5	62,0	17,4	28,3	27,5
«HELLY TEX» 100% PE	80	50	2.5	32,3	15,3	33,9	17,3
			3,0	49,5	18,3	35,2	27,6
			3,5	59,0	18,6	37,6	29,8
"Cuprates" (Italy) 70% PE 30% silk	90	70	2,5	33,8	11,1	18,1	17,7
			3,0	50,3	18,7	27,2	33,8
			3,5	53,2	19,7	38,7	37,6

Specific tension in the connecting joints do not exceed 20 h [2]. According to the research determined that the joints can withstand voltages which do not exceed the maximum possible in the product. Indicators of the strength of joints, tensile strength which is located along the seam - lower, but they are also close to the acceptable possible. As the results of research, increasing the number of stitches per 10 mm lines between 3 and 4 significantly affects the change in the strength of joints. It gives the right to recommend the manufacture of thread «Gutermann» and make the seams with stitch length 3.0 mm and 3.5 mm. 10 mm line. Studies on the resistance to water penetration welds performed in accordance with GOST 3816 on the penetrometer. The size of the samples with a diameter not less than 130 mm. The result of studies have taken the arithmetic mean values of five experiments. The results are presented in Table 4.

Table 4

The results of studies on resistance to water penetration welds

Name of tissue content of raw material composition,%	Needle number	Number thread (Or tex)	Stitch length L, mm	Pressure, Pp, Pa
1	2	3	4	5
"Rhine-light" (Italiya) 100% PE	90	70	2,5	50,0
			3,0	55,0
			3,5	50,0
1	2	3	4	5
«G-1000" 100% PE	85	60	2,5	120,0
			3,0	130,0
			3,5	122,0
HELLY TEX 100% PE	80	50	2,5	70,0
			3,0	80,0
			3,5	75,0
"Cuprates" (Italiya) 70% PE 30% silk	90	70	2,5	45,0
			3,0	55,0
			3,5	43,0

On the basis of research results plotted based resistance to water penetration welds, depending on the choice of needle, thread and stitch length, which is presented in Fig. 2.

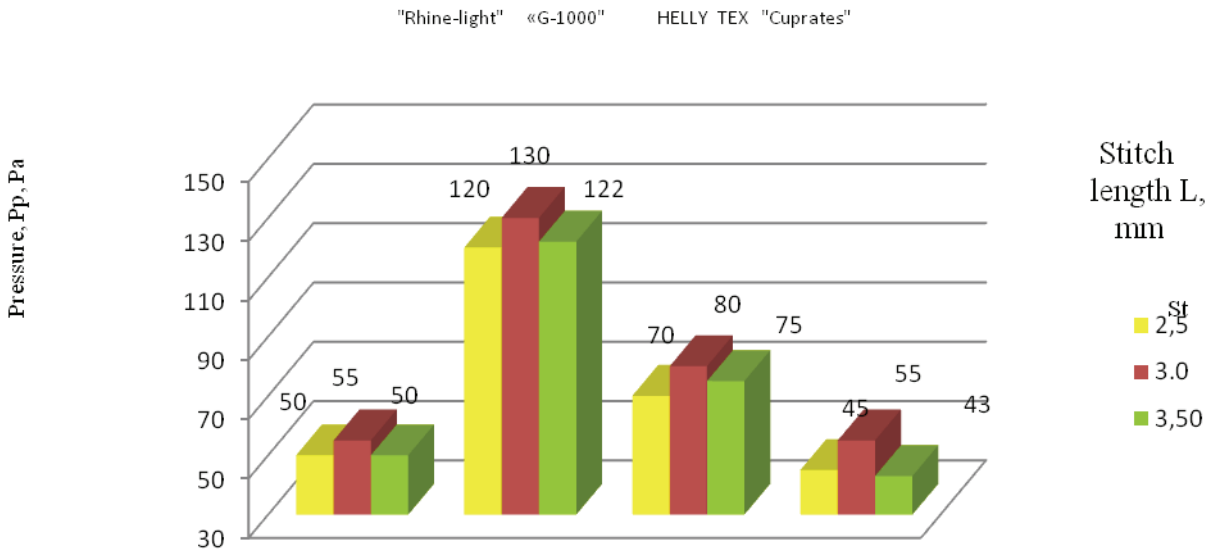


Figure 2 depending on resistance to water penetration welds.

The results indicate that with increasing frequency stitch seam strength increases, but decreases the coefficient of resistance to water penetration welds. Therefore, the recommended maximum stitch length - 3.0 mm.

Conclusions

The possibility of making joints without the use of a combination of adhesive and, in general, the technique of predicting the quality of manufacturing processes in a tent covering the design frame and tent structures.

Prospects for further research In the application of systematic campaign of solving ergonomic design frame and tent structures.

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Yu.N. Kovalyov, Doctor of Engineering, Prof. (NAU)
T.F. Shmelova, Candidate of Engineering, Assoc. Prof (NAU)

MODELING OF PERSONALITY AND ACTIVITIES OF AIR NAVIGATION SYSTEM OPERATOR

On the basis of the theory of S-space self-organization, the following is presented: operator's personality model; classification of psychological (personality) types; means of testing; processing and presentation of results. On the basis of Markov network, decision-making models are proposed, taking into consideration the circumstances of various flight situations.

Statement of purpose. Increasing flight safety depends on the quality of the interaction between the operator and the life support and guidance systems. According to the statistics of aviation accidents, about 80% of catastrophes, crashes and incidents take place because of the imperfection of the human factor. Hence it follows that the existing operator activity models lying in the foundation of contemporary ergatic systems are not sufficient, and the optimization of life support and guidance should rely on new approaches to the research and modeling of the operator and his or her activity.

Review of publications. There exist a large number of human personality models and operator activity models [1]. Their analysis shows that in essence their formalization is based on set-theoretic relationships, means of description and verification inherent in classical mathematics. Such approach is used, in particular, in the official documents of ICAO [2]. At the same time, comparing the properties of complex systems (which the socio-technical systems of aerial vehicle guidance are) and the paradigm of classical mathematics show their substantial differences. Therefore, many aspects of the operator's personality and operator activity (such as: the composition and correlation of the channels of interaction with the environment; intuitive and social decision-making aspects; the development of fatigue, stress, and so on) remain not formalized and cannot be controlled. The above said also relates to the testing methods, as well as the processing of obtained results.

The purposes of the publication are:

- Presenting the main provisions of a formalization instrument adequate to the properties of complex systems
- Substantiating the operator personality model; discovering the structure and weight coefficients of the channels of interaction with the environment;
- Psychological types classification;
- Choosing adequate testing and results processing methods;
- Substantiation of decision-making models for emergency situations under expected and unexpected conditions of aerial vehicle employment, taking into consideration social factors and in the context of various flight situations.

Main part. *Methods.* The basis of the proposed model is the axiomatic wave model of S-space, as well as model-specific means of description and verification methods [3].

The system of axioms includes four groups:

- Existence axioms (define the role of external impacts in the splitting of S-space into S-clusters and S-elements. Waves and solitons are attributed to the latter);
- Condition axiom (defines the modality of the element's condition depending on the condition of S-space and S-cluster, as well as the presence of feed back);
- Interaction axioms (define linear and non-linear interactions of waves and solitons: superposition, coincidence, interference and diffraction);
- Measurement axioms (postulate changeability of the coordinate system and the measured object in the act of measurement);

Thus the axioms describe such properties of complex system as openness, emergence, immanent changeability and extension, finiteness, heterogeneity, and non-linearity of impacts. Let

us note that for S-space relations classical cluster-theoretic relationships and logical verification methods are not applicable.

The goal of the S-space self-organization theory is to define the scenarios of its evolution depending on external impacts under the condition of preserving integrity. Calculations are conducted for the following: the levels of split; the number or clusters and elements on each of them; the potentials and conditions of the elements; symmetries and interactions; existence limits. These characteristics can be reflected in the statistical, dynamic and imitation models, distinguished by specific groups of invariants.

For modeling and optimization of a concrete complex system, the evolution of S-space is organized according to one of the scenarios, where the choice of the scenario and the calibration of invariants are conditioned by the information about the given system. The result is a structure of an emergent system, including quantities, distribution across the levels, correlations of elements potentials, composition of interaction channels, as well as the limit conditions, which define the existence or destruction of the system as the result of external impacts. The generalized target function here is the fulfillment of conditions of the emergent system's existence on all levels of its organization. Let us note that a certain part of complex systems (usually, engineering ones) are not emergent, and for their modeling the classical mathematical means are sufficient.

In just the same way, a certain part of the processes and interactions is linear, and there is no need for involving interaction axioms for their adequate understanding. Taking into consideration the nature of the modeled systems, processes and interactions, we shall use the paradigm of S-space for modeling the operator's personality in general; while the classical mathematics paradigm, in particular, the Markov network and the reflection theory will be used for modeling certain ways of decision making by the operator.

Operator personality model. The analysis of factual data about man-environment interaction leads to the conclusion that the prevalent scenario is (1S, 1O) [3]. A static model of this scenario in the form of PC-graph is presented in fig. 1.

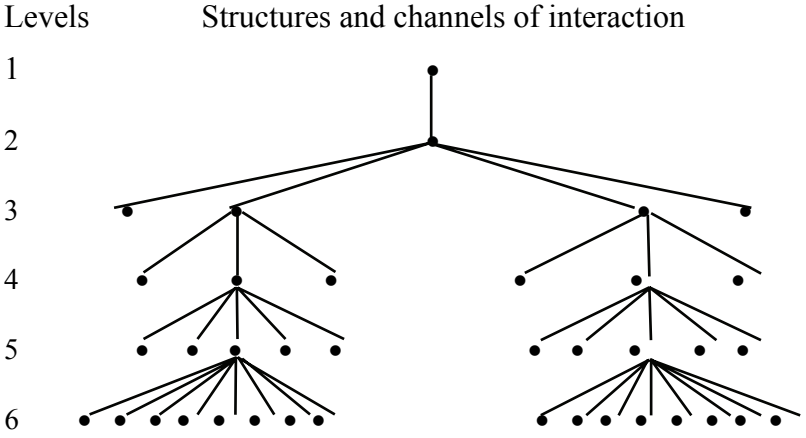

Fig. 1. Interaction in man-environment system

Hence it follows that various interactions between man and environment are conditioned by the symmetries, which emerge on each of the levels, based on the necessity of preserving the emergence of the man-environment system (an own preservation law corresponds to each of the symmetry kinds, according to Noether's theorem). The necessity of preserving the integrity of the man himself conditions the "endurance limits" of each of his organism's subsystems, which can be calculated and used for defining comfortable living conditions [4].

Applying the same scenario to man's personality modeling leads to the following conclusions.

1. Perception structure, channels and objects of interaction are show in fig. 2.

2. Man's perceptions of environment happen because the same self-organization laws act both for the man and for the environment. For the same reason, people perceive the world in a similar way.

LEVELS AND OBJECTS OF PERCEPTION	*PERCEPTION CHARACTERISTICS*	*CHANNELS, THEIR NUMBER AND WEIGHT COEFFICIENTS*
Level 1 – integrity	Man and environment are not singled out as parts, but the possibility of separation potentially exists	Intuition 1 (1)
Level 2 – separation	Man realizes himself as a self-sufficient entity, separate from the world	+ Ego 1 (insight, homeostasis) (0,618)
Level 3 – impacts and reactions	Impact on the surrounding world, feed back	+ Will and mind 2 (impact – reaction, «good» or «bad») (0,382)
Level 4 – space and time	Organizing and putting in order impacts and reactions by categories of space and time.	+ Wishes, feelings and intellect 2*3 (tracking forms and changes; language) (0,236)
Level 5 – colors, sounds, aromas, etc.	Organizing and putting in order the sense organs' perceptions	+ Sensations and emotions 2*3*5 (?) (0,146)
Level 6 – color hues, sound tones, etc.	Distinguishing tones and nuances	Sensations and emotions 2*3*5*8 (?) (0,09)

Fig. 2. The structure of human perception

The classification of psychological (personality) types is conditioned by the level of development of certain channels. Let us present the structure and short characteristics of psychological types (fig. 3).

BALANCED PERSONALITY. The distribution of potential across the levels is ideal; the person does not experience internal conflicts or health problems.

CONTEMPLATOR. The balance between the levels is disrupted; the increase of intuition takes place at the expense of ego and will. Contemplators are prone to calm way of life.

EGOIST. Enhancing ego, will and mind takes place at the expense of intuition, intellect and feelings. It is fraught with health problems, both mental and physical.

FIGHTER. Striving for self-realization; conflict character and aggressiveness (will prevails over mind); suppression of intuition, ego and intellect, which leads to physical and mental disorders

UP-AND-COMING RESEARCHER. Not inclined for escapades; likes predictability, order and stability. But within these limits, he is quite energetic, active and intelligent (mind prevails over will), which comes at the expense of the feelings.

ARTISTIC PERSONALITY. Has quite a good intuition; prone to effusion of feelings, commercialism. Enhancement of sensory feelings occurs at the expense of mind, will and

Fig.3. Classification and characteristics of psychological types

This classification correlates with some other classifications used in psychology, for instance, classifications by temperament, by needs (according to Maslow), in socionics – by types of informational metabolism, psychological dichotomy, etc.

Testing and results presentation.

For defining the psychological type and individual characteristics of an operator, the following tests are proposed:

FOR COMPREHENSIVE EVALUATION – Rorschach test, “Temperament evaluation”, psycho-geometrical test, scale of emotions significance by Dodonov.

FOR EVALUATING THE DEGREE OF PERCEPTIONS – tests “Checking intuition”, “Evaluating sociability”, “Defining the level of egotism in speech”, “Aggressiveness”, “Time-space organization”, “IQ”, “Associative abilities”, “Sensation-Seeking Scale” by Zuckerman.

FOR EVALUATING THE CURRENT STATE – personal and situational anxiety scales, “Evaluation of stress tolerance”.

After a regular statistical processing, it is suggested to present test results on a special distribution diagram, which reflects the orientation of the person’s subjective space and the weight coefficients of his or her abilities (fig. 4);

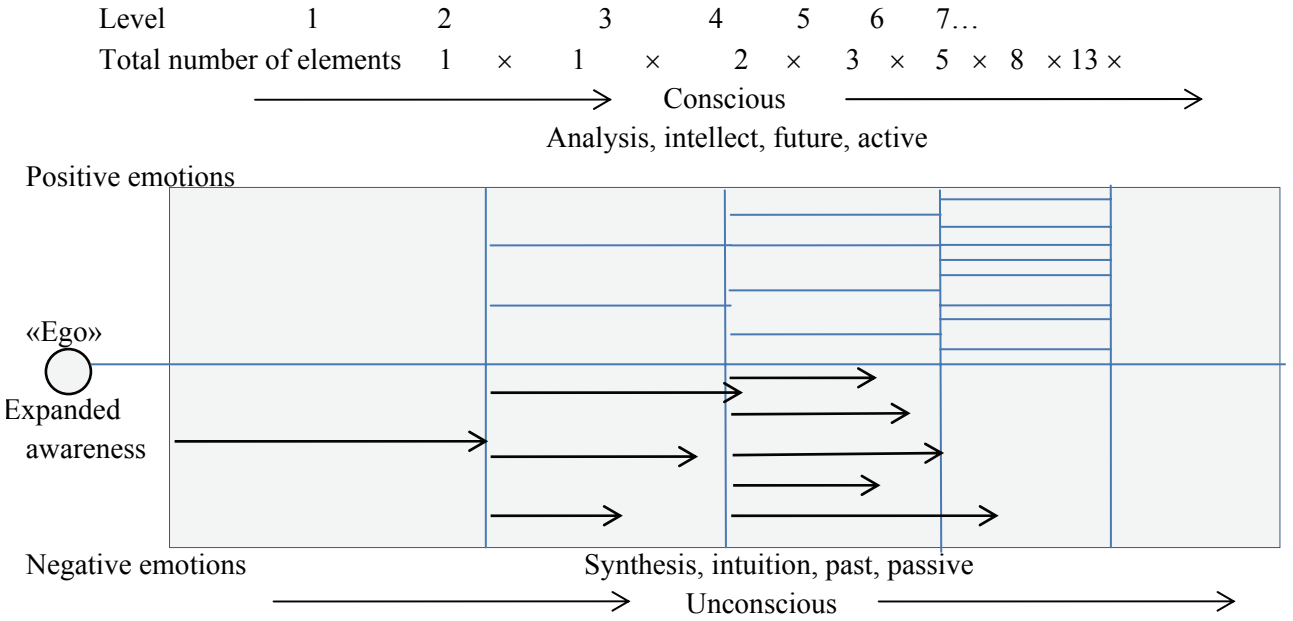

Fig. 4. Distribution diagram for psychological portrait depiction

FOR THE EVALUATION OF CURRENT STATE AND DIAGNOSING THE DEFORMATIONS OF EMOTIONAL STATE DURING CHANGEOVER TO DANGEROUS TYPES OF ACTIVITIES IN EMERGENCY SITUATIONS – information, analysis and diagnostics suite (modules “Prompt” (for information support of the operator when choosing the optimal option of flight finishing in emergency situation); “Diagnosing the emotional state of human operator” (fig. 5)).

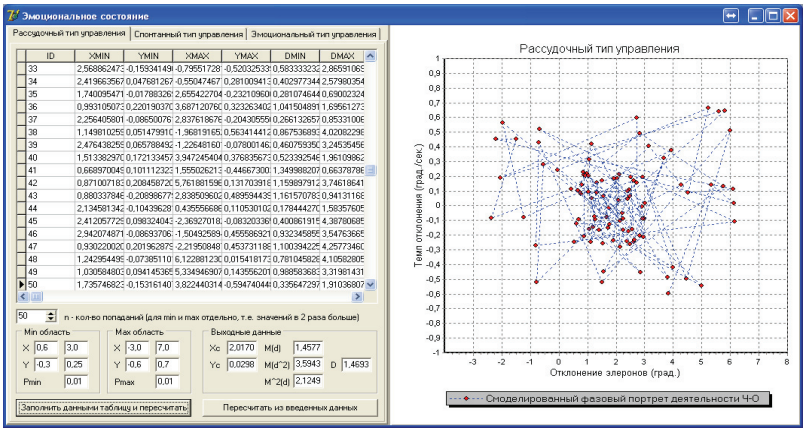

Fig.5. Modeling mind-based type of operator’s behavior

FOR PROFESSIONAL QUALITIES ASSESSMENT AND DEFINING A SOCIONIC TYPE – information, analysis and diagnostics suite (module “Diagnosing the operator’s socionic model”).

The computation of one of the scenarios of the flight situation development is presented in fig. 6 (for example – approach to land in bad weather conditions [1]). According to data of the National Transportation Safety Board (NTSB), during the last 10 years 21,3% aviation accidents happened due to weather conditions, of which 39,1% - in bad weather conditions. The major cause

of aviation accidents in bad weather conditions (68%) considered improper and untimely decision-making by crew of the aircraft. Based on the W-functions of positive and negative of H-O choice the Markov's network of flight situations' development from normal to catastrophic and conversely was constructed.

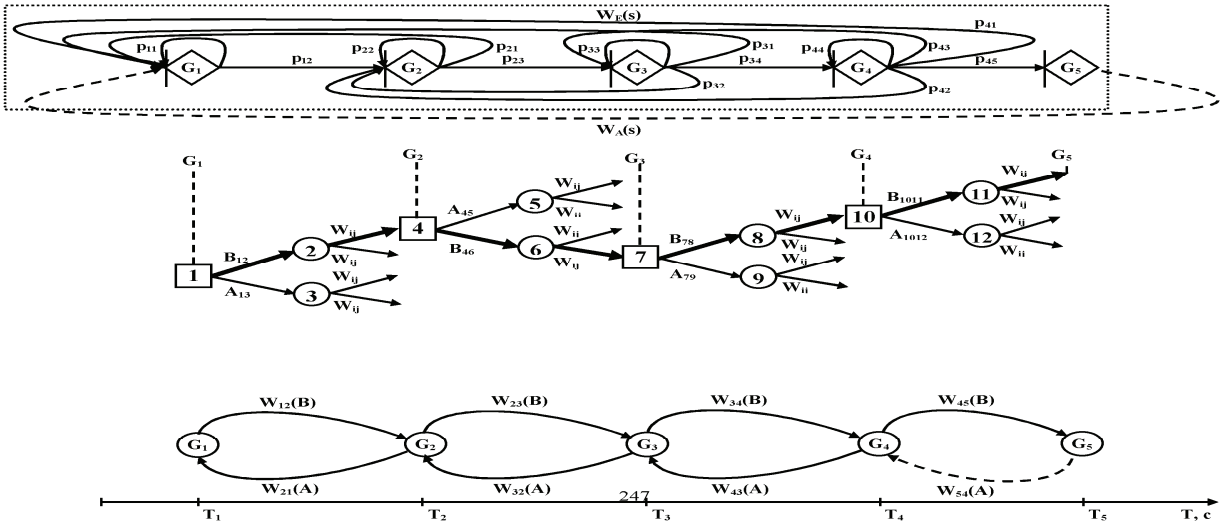

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Fig. 6. Stochastic models: GERT network, decision tree and Markov's network:

W_{ij}, $W_E(s)$, $W_A(s)$ – transmission coefficients of (i,j) - arc, of open network and of dummy arc;

G_1 ,G_2, G$_3$, G_4 ,G_5 – normal, complicated, difficult, emergency, catastrophic situations;

A, B – positive or negative choice;

p_{ii} (p_{11}, p_{22}, p_{33}, p_{44}) – probability of stabilization of i - flight situation, $i=\overline{1;n-1}$;

$p_{i(i+1)}$ (p_{12}, p_{23}, p_{34}, p_{45}) – probability of development of i - flight situation toward complications, $i=\overline{1;n-1}$;

$p_{i(i-k)}$ (p_{21}, p_{32}, p_{43} – 1-loop; p_{31}, p_{42} – 2-loop; p_{41} – 3-loop) – probability of flight emergency situation preventing, $k=\overline{1;3}$.

Conclusions

1. Advanced information display and guiding systems should be based on intuitive perceptions and back actions, as they are the most common and quick-response, and equipped with the appropriate data encoding and guiding systems. The guiding system should be also vested with the functions of ensuring operator's comfort in stress conditions and non-standard situations.

2. The designing of such systems (the authors plan to expand on this topic in their future publications) must be followed by appropriate professional selection and training of the operators.

3. Test results can be used for defining comfortable conditions for the operator and building models of his or her behavior in stressful or non-standard situations.

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I.A. Lysiuk, PHD student (National Aviation University, Ukraine)

FUNCTIONS IN ORGANIZATION OF AIRRELAXATION CENTER

In the article the actuality of creation of a new architectural unit is considered in the system of the airport - a center of airrelaxation, designed especially for providing rest of workers and visitors, features of its functioning, depending on the necessities of users.The problem of airport rest is very important for the reason of the accident' number, which were made by human mistakes. To decrease the level of stresses in the surrounding of the big air transit centre it is necessary to intend a place for all-around rest for all kinds of users.

Raising of problem. Today actual for doing business and popular for forming of positive psychological establishments and increase of capacity for workers became a tendency in creation of the relaxation and entertainment centers with the use of modern methods of the psychophysical and emotional unloading. It allows to achieve maximal results in execution functional duties, and, main of all - the personal interest of workers, who has a chance not only to rest but also to get healthy and have fun after completion a working day. Practice of arranging of similar establishments is widespread enough on enterprises and, what it is more important, in aviation industry in the countries of Europe, America, Eastern Asia and others like that, but absent in the airports of our country. This negatively affects capacity of personnel and psychological condition of visitors and passengers.

Therefore in the airports of our country the specialized center of airrelaxation for rest of workers and visitors of airport it is possible to examine as fully new unit which will provide the proper not only usual rest, but also will allow to decrease the risk of influence of human factor on flights safety. The versatile relaxation techniques will create a favorable environment for recovery of psychoemotional condition, as well ease the long wait between flights for crews and passengers.

For every category of users should be provided the certain methods of rest, relaxation and entertainments to achieve of maximal result. Combination and various solution the principles of availability and separation of functions of the airrelaxation center, and also placing it in the environment of airport will allow to create comfort space for stay and satisfaction of necessities. Depending on the psychological needs of visitors of the centre is determined what is necessary for them: unloading or revitalization, relaxation or stimulation.

It is thus possible to manage maintenance of relaxation by functional organization of streams of personnel and passengers, taking into account work and hours of waiting in the hall of the airport, and creation of airrelaxation centers on the basis of study of all functions of relaxation and account them in its functional organization is an important factor for work of airport on the whole.

Analysis of researches and publications. The predecessors of centers of relaxation were clubs for leisure, which function was examined during all the history since the origin of such architectural unit.

The beginning of the club activity can be considered different sort of fraternity, groups, societies which function was sent to organization of communication and leisure interests [2].

Successful attempts to work out the conception of club of the modern type took place in soviet times. In 20th of XX c. there was a fundamentally search of new architectural decisions in the conditions of decentralization of club activity and becoming of it organizational forms. 30-50th were marked by development of only architectural conception in the conditions of height of organization of club design beginning (there is beginning of the typical planning exactly in this period). At 60-80th a club experiences development of the typical planning of forms of work. The new stage of development of independent action of club collectives and searching planning came in 90th. Today there are an increase of requirement in club establishments and development of the newest architectural tendencies on the basis of development of technologies.

In architecture the value of a club, as links in providing of rest of population were examined by Gelfond A.L. [1], focusing attention on the greater value of spectator function in such type of the

building. Adamovich V.V., Barchin B.G. and Varezhkin V.A. considered a question about expedience of club organization as multifunction complex which will connect a few functions in itself.

At the modern stage, much attention is given to the organization of club space, particularly, by the Kyiv architect Babyshkin S.V. in the project of the International creative center of Jan Tabachnyk. The complex includes the apartments of Creative Club and visual hall is planned for 3700 places.

In modern airports exist only two establishments of providing of relaxation: preventive clinic and cult way of life. In first case to its tasks there is realization of complex of works to provide a reception, placing, medical services and rest of transit crews, and in the second is providing of increase of cultural and educational level of workers, improvement of their physical and moral condition.

Some airports have a room of the psychological unloading in the list of apartments, but often her activity is limited to one type of relaxation and spreads to the narrow circle of users.

But it not sufficiently for providing of valuable moral and physical rest of visitors and workers of airport. Therefore in further researches it is expedient to consider organization of center of airrelaxation, where the taken into account possibility of providing of users all necessary types of rest will be, sparing the special attention to the necessary type of relaxation separately for every group.

Purpose of the article. This publication is raising. Its specific purpose is a determination of principles of the functional design, the organization of airrelaxation centers on the basis of analysis of necessities of visitors and workers, determining its location in the structure of airport.

Basic part.

1. Determination of purpose of work of center of airrelaxation.

For formulation of purpose of work of center of airrelaxation it is necessary to define functions which satisfy the necessities of users .

In such to the type center of can be distinguished three degrees providing comfort of workers and visitors :

- Relaxation;
- Rest;
- Entertainments.

Purpose of relaxation consists of the possibility to get rid of a fatigue and get a stimulus for work. It is presented by such kinds as:

- *psychological*, that includes the rooms of the psychological unloading;
- *emotional*, where therapy of fear of flight of passengers and moral weakening are conducted for workers;
- *physical,* that allows to engage in physical exercises during a dwell;
- *mental*, that enables distracted from conservative work and point the activity at something a new.

Exactly relaxation occupies key position in a grant to the users of services in possibility to be simultaneously weakened and picks up thread cheerfulness for further activity. Unloading is both physical and mental, promotes a decrease of tension and provides of comfort of working.

Types of rest in an airport it can be two: active and passive. Active rest includes a gymnasium and culture life, the passive is presented by intercourse and sleep. Thus it follows to take into account that such transport knot, as an airport works twenty-four-hour, that means by turn work. Therefore providing of users the necessary type of rest is a important to provide successful operating of all systems condition for realization of departure and arriving of passengers.

Although an airport by its nature provides a transit function only, the presence of entertaining measures positively influences on the level of comfort of stay in his environment. For providing of necessities of users in the center of relaxation it is possible to foresee the different types of entertainments, so for example a cybercafe, also a videohall, as it is required by increasing civilization in the informative sphere of activity of the modern man. Functioning of such services will help to get distracted from a routine and will reduce the risk of origin of stress situations.

This way defined three key directions of the center of airrelaxations which satisfy scalene necessities, concentration on the simultaneous psychologically-emotional unloading and activation of activity of users. In the system of airport it plays a very important role for providing of continual

activity of all functions of transit knot.

2. Determination of categories of users of center of airrelaxation.

Each employee, depending on the load required a specific type of relaxation that will help get rid of fatigue, both physical and moral, prevent stress and exhaustion, is needed, will stimulate to the further actions. It is necessary to provide a comfort environment for passengers and visitors, in fact not depending on time of stay in an airport, there is a requirement in rest and entertainments.

Thus certainly, that work of center of airrelaxation spreads on three categories of users:

–Personnel of airport;

–Passengers;

–Visitors.

Accounting the necessity each of these groups creates the picture of functioning of center. Relaxation and rest will spread to the personnel of airport, in turn passengers will use therapy of fear and entertainment, and visitors – rest and entertainments.

But the function of center in a considerable measure will depend on the enormous amount of factors which determine the amount of working, percent of women among them, age of users. For this reason at determination of functions of center all terms must be maximally taken into account separately for every airport.

Thus, defining the categories of users and taking into account all factors of influence it is possible to determine the structure of center activity of which will appear the most resultutive for a certain airport.

3. Research of modern methods of relaxation is for visitors and workers of airport.

In modern terms the enormous amount of possibilities of rest is created from work, each of which can appear most effective for the certain type of activity. For relaxation of users of aviation industry it is possible to define such kinds:

a) Mental relaxation

Presented mainly by possibility to play the specialized computer games (such as "Diver: Deep Water Adventures" is a game about the submarine world, worked out especially for workers) and by creative activity (drawing, needlework for the removal of stress).

b) Physical relaxation

Its main constituent is a trainer hall with a possibility to engage in physical exercises which are very important during permanent work in one position. The use of massage therapy is possible also for weakening.

c) Emotional relaxation

It is very important in therapy of fear of flight, because in fact air industry collects all greater popularity now, and the phobias of height disappeared nowhere. Therefore passengers at pleasure can avail from this favour.

To except that emotional relaxation will be useful to the personnel which constantly is in the condition of stress at socializing with plenty of people simultaneously.

d) Psychological relaxation

Provided by the mainly specialized room of the psychological unloading which includes visual relaxation, audio relaxation and aromatherapy.

It is also possible bringing in of flora and fauna during a contact from which of feel of man gets better considerably.

However in modern society there can be all new and new kinds of relaxation, which more effectively will allow providing the requirements of personnel in the decline of level of stress and development of depression, minimization of human factor which will allow avoiding impermissible errors in-process.

It is possible to draw conclusion, that all these types of relaxation are a necessary link in maintenance of moral and physical health, comfort of personnel of airport and passengers of airport. Their valuable work and permanent modernization will become the prophylaxis of negative anthropogenic influence on activity of such important integral environment as airport.

4. Determination of interdependence is between the certain type of relaxation and activity

of users.

Electing of certain type of relaxation, necessary to the concrete user plugs difficult and many-sided approach in the type of activity of worker, determinations of the personal necessities, which change depending on age, sex, burn-time, psychologically-emotional condition.

Generally speaking, it is possible to mark that psychological relaxation can be used practically for all workers. The emotional is used for professions with possibility of work with people, physical - during conservative work in a room, assiduous method of work, mental - for those, who works physically and executes monotonous tasks.

Potential of recreation may be used by employees, who work hard physically or emotionally at a very large load. Entertainments are needed in order that personnel were able to be for a while distracted from duties, and then inspired and by new forces to go back to work.

Functioning of center of relaxation of such to the type to the large measure depends also on placing. Exactly it will determine the types of rest of workers from work, proceeding in physical and psychological possibilities, and comfort of stay of other users. A center can be in the system of apartments of airport, out of its territory, and also as separate unit in the environment of city. It is determined by the necessities of every transit knot, its sizes and carrying capacity.

For comfort of access and greater efficiency of work it is certainly expedient to arrange relaxation into an airport. But sometimes it is not possible, if activity of such center can hinder to the transit ways, to use the such limited area. In such case it is expedient to arrange a center in the distance 300-500 meters from a main terminal along a transport entrance. Functioning of all constituents of relaxation is here provided, and there is independent of complex territory. By another possible variant of placing of center in the environment of city as a separate link, where all requirements can be provided in rest and entertainments of users, but activity of relaxation constituents diminishes the meaningfulness, and some her kinds in general are taken to the minimum, such as, for example, to therapy fear of flight.

For this reason, for greater efficiency in the center of airrelaxation it follows to foresee possibility of diagnostics in place, that will take into account the requirements of people in set time and after certain activity.

Here, for achievement of the best results in-process center it follows to take into account requirements in rest of every person separately in a complex with many influences which determine проблематику in the structure of relaxation of workers and users of airport. On the basis of determination of all constituents of functioning of center of relaxation it is possible it will be to get the list of necessary apartments for the successful prosecution of removal of psychological and physical overstrain of users.

Conclusions

Thus, the basic aspects of forming of airrelaxation centers and importance of their work are considered in the system of airport. Functions which provide requirements in rest of users were certain. It is educed that its functions depend on many factors which have an influence on the structure of center, called to provide a comfort and minimize influence of human factor on work of airport. The ways of further research are formulated for the purpose determination of component elements of airport unit of new type.

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Mykhalevych V., ph. d. in culture science (National Aviation University),
Morozov A., ph.d. in philosophy (Ukraine, The Taras Shevchenko Kiev National University)

THE USAGE OF INTUITION AND ARCHETYPES IN AIROPORT DESIGN

It is observed the archetype theory of Karl Jung and different types archetypes of collective unconsciousness. The usage of intuition is regarded as the creative source in airports' design.

An airport is a location where aircraft such as fixed-wing aircraft, helicopters, and blimps take off and land. Aircraft may be stored or maintained at an airport. An airport consists of at least one surface such as a runway for a plane to take off and land, a helipad, or water for takeoffs and landings, and often includes buildings such as control towers, hangars and terminal buildings.Larger airports may have fixed base operator services, seaplane docks and ramps, air traffic control, passenger facilities such as restaurants and lounges, and emergency services. A military airport is known as an airbase or air station. A good airoport must have respectable image.

Thus it is important to use intuition and archetypes in airoport design. The contents of the collective unconscious are called archetypes. Jung also called them dominants, imagos, mythological or primordial images, and a few other names, but archetypes seems to have won out over these. An archetype is an unlearned tendency to experience things in a certain way. The archetype has no form of its own, but it acts as an "organizing principle" on the things we see or do. The archetype is like a black hole in space: You only know its there by how it draws matter and light to itself. The mother archetype is a particularly good example. All of our ancestors had mothers. We have evolved in an environment that included a mother or mother-substitute. We would never have survived without our connection with a nurturing-one during our times as helpless infants. It stands to reason that we are "built" in a way that reflects that evolutionary environment: We come into this world ready to want mother, to seek her, to recognize her, to deal with her. So the mother archetype is our built-in ability to recognize a certain relationship, that of "mothering." Jung says that this is rather abstract, and we are likely to project the archetype out into the world and onto a particular person, usually our own mothers. Even when an archetype doesn't have a particular real person available, we tend to personify the archetype, that is, turn it into a mythological "story-book" character. This character symbolizes the archetype. The mother archetype is symbolized by the primordial mother or "earth mother" of mythology, by Eve and Mary in western traditions, and by less personal symbols such as the church, the nation, a forest, or the ocean. According to Jung, someone whose own mother failed to satisfy the demands of the archetype may well be one that spends his or her life seeking comfort in the church, or in identification with "the motherland," or in meditating upon the figure of Mary, or in a life at sea.

Mana. You must understand that these archetypes are not really biological things, like Freud's instincts. They are more spiritual demands. For example, if you dreamt about long things, Freud might suggest these things represent the phallus and ultimately sex. But Jung might have a very different interpretation. Even dreaming quite specifically about a penis might not have much to do with some unfulfilled need for sex. It is curious that in primitive societies, phallic symbols do not usually refer to sex at all. They usually symbolize mana, or spiritual power. These symbols would be displayed on occasions when the spirits are being called upon to increase the yield of corn, or fish, or to heal someone. The connection between the penis and strength, between semen and seed, between fertilization and fertility are understood by most cultures.

The shadow. Sex and the life instincts in general are, of course, represented somewhere in Jung's system. They are a part of an archetype called the shadow. It derives from our prehuman, animal past, when our concerns were limited to survival and reproduction, and when we weren't self-conscious. It is the "dark side" of the ego, and the evil that we are capable of is often stored there. Actually, the shadow is amoral -- neither good nor bad, just like animals. An animal is capable of tender care for its young and vicious killing for food, but it doesn't choose to do either. It just does what it does. It is "innocent." But from our human perspective, the animal world looks rather brutal, inhuman, so the shadow becomes

something of a garbage can for the parts of ourselves that we can't quite admit to. Symbols of the shadow include the snake (as in the garden of Eden), the dragon, monsters, and demons. It often guards the entrance to a cave or a pool of water, which is the collective unconscious. Next time you dream about wrestling with the devil, it may only be yourself you are wrestling with!

The persona represents your public image. The word is, obviously, related to the word person and personality, and comes from a Latin word for mask. So the persona is the mask you put on before you show yourself to the outside world. Although it begins as an archetype, by the time we are finished realizing it, it is the part of us most distant from the collective unconscious. At its best, it is just the "good impression" we all wish to present as we fill the roles society requires of us. But, of course, it can also be the "false impression" we use to manipulate people's opinions and behaviors. And, at its worst, it can be mistaken, even by ourselves, for our true nature: Sometimes we believe we really are what we pretend to be!

Anima and animus. A part of our persona is the role of male or female we must play. For most people that role is determined by their physical gender. But Jung, like Freud and Adler and others, felt that we are all really bisexual in nature. When we begin our lives as fetuses, we have undifferentiated sex organs that only gradually, under the influence of hormones, become male or female. Likewise, when we begin our social lives as infants, we are neither male nor female in the social sense. Almost immediately -- as soon as those pink or blue booties go on -- we come under the influence of society, which gradually molds us into men and women. In all societies, the expectations placed on men and women differ, usually based on our different roles in reproduction, but often involving many details that are purely traditional. In our society today, we still have many remnants of these traditional expectations. Women are still expected to be more nurturant and less aggressive; men are still expected to be strong and to ignore the emotional side of life. But Jung felt these expectations meant that we had developed only half of our potential. The anima is the female aspect present in the collective unconscious of men, and the animus is the male aspect present in the collective unconscious of women. Together, they are refered to as syzygy. The anima may be personified as a young girl, very spontaneous and intuitive, or as a witch, or as the earth mother. It is likely to be associated with deep emotionality and the force of life itself. The animus may be personified as a wise old man, a sorcerer, or often a number of males, and tends to be logical, often rationalistic, even argumentative. The anima or animus is the archetype through which you communicate with the collective unconscious generally, and it is important to get into touch with it. It is also the archetype that is responsible for much of our love life: We are, as an ancient Greek myth suggests, always looking for our other half, the half that the Gods took from us, in members of the opposite sex. When we fall in love at first sight, then we have found someone that "fills" our anima or animus archetype particularly well!

Other archetypes. Jung said that there is no fixed number of archetypes which we could simply list and memorize. They overlap and easily melt into each other as needed, and their logic is not the usual kind. But here are some he mentions: Besides mother, their are other family archetypes. Obviously, there is father, who is often symbolized by a guide or an authority figure. There is also the archetype family, which represents the idea of blood relationship and ties that run deeper than those based on conscious reasons. There is also the child, represented in mythology and art by children, infants most especially, as well as other small creatures. The Christ child celebrated at Christmas is a manifestation of the child archetype, and represents the future, becoming, rebirth, and salvation. Curiously, Christmas falls during the winter solstice, which in northern primitive cultures also represents the future and rebirth. People used to light bonfires and perform ceremonies to encourage the sun's return to them. The child archetype often blends with other archetypes to form the child-god, or the child-hero.

Many archetypes are story characters. The hero is one of the main ones. He is the mana personality and the defeater of evil dragons. Basically, he represents the ego -- we do tend to identify with the hero of the story -- and is often engaged in fighting the shadow, in the form of dragons and other monsters. The hero is, however, often dumb as a post. He is, after all, ignorant of the ways of the collective unconscious. Luke Skywalker, in the Star Wars films, is the perfect example of a hero.

The hero is often out to rescue the maiden. She represents purity, innocence, and, in all likelihood, naivete. In the beginning of the Star Wars story, Princess Leia is the maiden. But, as the story progresses, she becomes the anima, discovering the powers of the force -- the collective unconscious -- and becoming an

equal partner with Luke, who turns out to be her brother. The hero is guided by the wise old man. He is a form of the animus, and reveals to the hero the nature of the collective unconscious. In Star Wars, he is played by Obi Wan Kenobi and, later, Yoda. Notice that they teach Luke about the force and, as Luke matures, they die and become a part of him. You might be curious as to the archetype represented by Darth Vader, the "dark father." He is the shadow and the master of the dark side of the force. He also turns out to be Luke and Leia's father. When he dies, he becomes one of the wise old men.

There is also an animal archetype, representing humanity's relationships with the animal world. The hero's faithful horse would be an example. Snakes are often symbolic of the animal archetype, and are thought to be particularly wise. Animals, after all, are more in touch with their natures than we are. Perhaps loyal little robots and reliable old spaceships -- the Falcon-- are also symbols of animal. And there is the trickster, often represented by a clown or a magician. The trickster's role is to hamper the hero's progress and to generally make trouble. In Norse mythology, many of the gods' adventures originate in some trick or another played on their majesties by the half-god Loki. There are other archetypes that are a little more difficult to talk about. One is the original man, represented in western religion by Adam. Another is the God archetype, representing our need to comprehend the universe, to give a meaning to all that happens, to see it all as having some purpose and direction. The hermaphrodite, both male and female, represents the union of opposites, an important idea in Jung's theory. In some religious art, Jesus is presented as a rather feminine man. Likewise, in China, the character Kuan Yin began as a male saint (the bodhisattva Avalokiteshwara), but was portrayed in such a feminine manner that he is more often thought of as the female goddess of compassion! The most important archetype of all is the self. The self is the ultimate unity of the personality and issymbolized by the circle, the cross, and the mandala figures that Jung was fond of painting. A mandala is a drawing that is used in meditation because it tends to draw your focus back to the center, and it can be as simple as a geometric figure or as complicated as a stained glass window. The personifications that best represent self are Christ and Buddha, two people who many believe achieved perfection. But Jung felt that perfection of the personality is only truly achieved in death.

Conclusion

Jung's theory divides the psyche into three parts. The first is the ego,which Jung identifies with the conscious mind. Closely related is the personal unconscious, which includes anything which is not presently conscious, but can be. The personal unconscious is like most people's understanding of the unconscious in that it includes both memories that are easily brought to mind and those that have been suppressed for some reason. But it does not include the instincts that Freud would have it include. But then Jung adds the part of the psyche that makes his theory stand out from all others: the collective unconscious. You could call it your "psychic inheritance." It is the reservoir of our experiences as a species, a kind of knowledge we are all born with. And yet we can never be directly conscious of it. It influences all of our experiences and behaviors, most especially the emotional ones, but we only know about it indirectly, by looking at those influences. There are some experiences that show the effects of the collective unconscious more clearly than others: The experiences of love at first sight, of deja vu (the feeling that you've been here before), and the immediate recognition of certain symbols and the meanings of certain myths, could all be understood as the sudden conjunction of our outer reality and the inner reality of the collective unconscious. Grander examples are the creative experiences shared by artists and musicians all over the world and in all times, or the spiritual experiences of mystics of all religions, or the parallels in dreams, fantasies, mythologies, fairy tales, and literature. The archetypes and intuition is also can be used in airoport design.

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V.M. Pershakov, the candidate of technical science, professor (NAU, Ukraine)
T.O. Petrova, student (NAU, Ukraine)

TERRAFORMING OF MARS PLANET

The main task is the terraforming of Mars planet. Nowadays it is a very important task, because there are a lot of problems on the planet Earth, which deals with the exhaustion of natural resources. The solution is in the colonizing, building and transport formation on Mars planet. After researching with a help of NASA devices, scientist could develop different ideas about constructions and transport inventions for new planet of human.

Introduction . Mars is the fourth planet from the Sun. It is also the nearest planet to the Earth and will probably be the first planet visited by humans. Mars is actively investigating the possibility of humans colonizing this planet, because Mars is the most Earth-like planet of all the planets in the solar system. (fig.1)

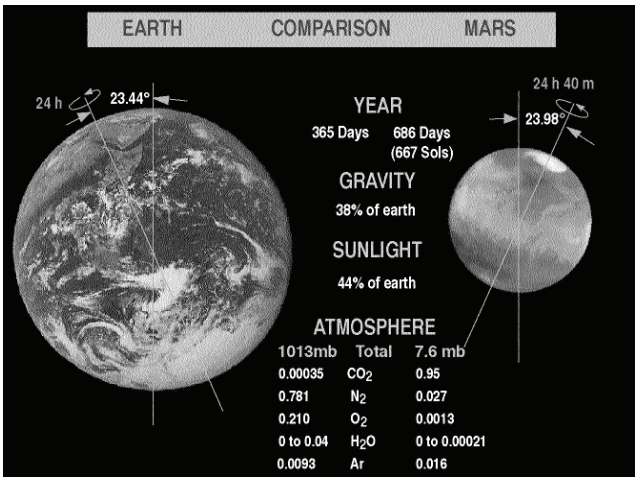

Fig. 1 Comparison of the planet Earth and Mars

As it was mentioned above, Mars is the most like planet to the Earth, but there is one main problem – the absence of the atmosphere with oxygen that's why the main tasks are in thickening Martian atmosphere, warming it to comfortable levels and transforming it into breatable air.

The idea of achieving these goals can be realized, because the Mars colonizing has following advantages:

- it has a very similar length of day. A Martian day is 24 hours and 39 minutes, so plants and animals might find that familiar;
- it has an axial tilt very similar to Earth. This gives it familiar seasons to our home planet;
- it has vast reserves of water in the form of ice. This water would be essential for human travelers to Mars, and could also be used to make rocket fuel and hydrogen for fuel;
- the advantages to having a Mars colony are to be able to conduct long-termscience studies there, and to be able to travel over large distances on the surface repeatedly.

Study Area. Mars is the most likely to have substantial quantities of water, making it the best bet for sustaining life. But the most significant question is in possibility to live there, not only from economic point of view, but an engineering also.

The atmosphere of Mars is very thin. Its density is about 1% of that of the earth. It creates problems for heavy spaceships on the surface of Mars. Thus, a specially designed braking and landing system is needed. The currently used robotic systems for landing on Moon and Mars cannot be used in this case. The effects of Martian gravity on human health have not been studied yet. So, it is difficult to predict whether Mars can support human life in the long term.

Robert Zubrin, in his book, “The Case for Mars”, explains how future human colonists might be able to live off the land when traveling to Mars, and eventually colonizing it. Instead of bringing all their supplies from Earth – like the inhabitants of the International Space Station – future colonists would be able to make their own air by splitting water on Mars into oxygen and hydrogen. This Martian water would also be used for drinking, and even rocket fuel.

Preliminary experiments have shown that Mars soil could be baked into bricks to create protective structures. Earth plants could even be grown in Martian soil, assuming they get enough sunlight and carbon dioxide.

To realize these first colonists should to construct the underground shelter. (fig. 2)

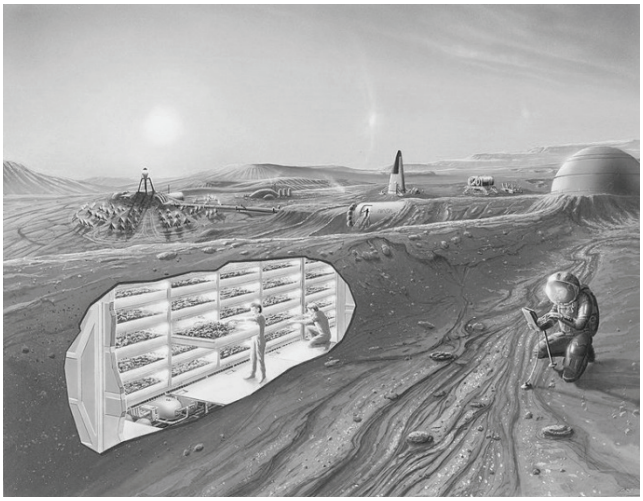

Fig. 2 Underground shelter in cross-section

It is very important to construct underground shelters for Martian people, because the atmospheric pressure is low, and the solar radiation is too big and dangerous at which people can’t survive without pressure suits.

Initially, the planetary engineers and early colonists would live in their spacecraft and in prefab habitation modules brought from Earth, but soon construction would need to begin on permanent Mars structures. Since there are neither forests existing yet on Mars to harvest, nor any cement factories, structures would need to be constructed with the available material. On Mars, rocks and dirt are plentiful, and similar materials have been used for building on Earth for thousands of years. Examples of this construction include caves, stacked and mortared stone, adobe and rammed earth. More modern examples include cast stabilized earth, earth-bag structures and excavated underground spaces.

Transport and buildings formation. The main task is in research the planet and its structure by the help of NASA's Mars Exploration Rover (MER). This mission is an ongoing robotic space mission involving two rovers, Spirit and Opportunity, exploring the planet Mars. It began in 2003 with the sending of the two rovers—MER-A Spirit and MER-B Opportunity—to explore the Martian surface and geology. (fig.3)

The scientific objectives of the Mars Exploration Rover mission are to:

- Search for and characterize a variety of rocks and soils that hold clues to past water activity. In particular, samples sought will include those that have minerals deposited by water-related processes such as precipitation, evaporation, sedimentary cementation, or hydrothermal activity.

- Determine the distribution and composition of minerals, rocks, and soils surrounding the landing sites.

- Determine what geologic processes have shaped the local terrain and influenced the chemistry. Such processes could include water or wind erosion, sedimentation, hydrothermal mechanisms, volcanism, and cratering.

- Perform "ground truth" -- calibration and validation -- of surface observations made by Mars orbiter instruments. This will help determine the accuracy and effectiveness of various instruments

that survey Martian geology from orbit.

- Search for iron-containing minerals, identify and quantify relative amounts of specific mineral types that contain water or were formed in water, such as iron-bearing carbonates.

- Characterize the mineralogy and textures of rocks and soils and determine the processes that created them.

- Search for geological clues to the environmental conditions that existed when liquid water was present. Assess whether those environments were conducive to life.

Fig. 3 Mars exploration rover

After researching with a help of NASA devices, scientist could develop different ideas about constructions and transport inventions, which could be constructed on the planet Mars, and which give the possibility to live there in future.

The underground constructions have many benefits such as a more stable temperature, very secure and stable surroundings, and protection from solar radiation and micrometeorites. On Earth human underground construction is accomplished with large equipment that digs holes, explosives that break up rock, and conveyance systems to remove the debris. Since protection from above is the goal, simply digging a hole wouldn't be sufficient. Spaces would need to be created as tunnels that were expanded to form caverns. The logical choice for this is a mining device called a road header. (fig.4)

Fig.4 A road header during work procedure

A road header consists of a treaded body with an extending boom that sweeps across a rock face with a cutter head. Large road headers are capable of removing about 40 cubic meters of rock before moving the base forwards. Recent advancements in mining technology have produced automated road headers, capable of selectively cutting rock faces to extract valuable ore while

ignoring the rest of the rock.

The entire terraforming (fig.5) (*Terraforming* - of a planet, moon, or other body is the hypothetical process of deliberately modifying its atmosphere, temperature, surface topography or ecology to be similar to those of Earth to make it habitable by terrain organisms) process should take around a century, during which time technological advances on Earth would be occurring in the areas of energy production, nanotechnology, food production and every other aspect of our society.

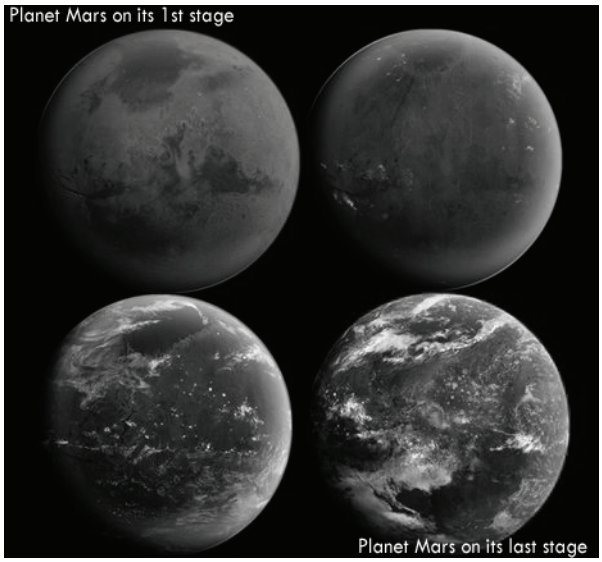

Fig. 5 Terraforming of the planet Mars

Conclusions

Many of the sustainable practices being developed here on Earth would be implemented on Mar because there are very little resources there. Every part of the colony would need to be carefully planned to account for this, but this would serve as an opportunity to create a completely new model of human civilization, doing things right from the very start.

There are different ideas and suggestion for developing the new planet for living conditions. People should to apply immense efforts for realization such space project. The implementation of new technologies will create a powerful world, which will help Earth in future.

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Y.V. Socolova, PHD student (National Aviation University, Ukraine)

CURRENT SITUATIONWITH THE TRANSPORT UNIVERSITIES AND ITS WAYS TO IMPROVMENT

This article deals with domestic experience designing university transport, defined a number of issues arising from the significant social and economic changes of recent decades in Ukraine. Determine the need for expansion and improvement of the current base schools.

Raising of problem. Integration of Ukraine to the list of modern highly developed countries requires the establishment of conditions for quality of education that meets international norms and standards. Designing university was devoted a lot of research and review current rapid growth requirements for transport training process issue remains relevant. Architecture and planning organization of the transport university at the moment is based on general rules of universities designing, excluding the specific features of training in the fields of transport direction. The peculiarity of these universities lies in their direct connectivity to transport infrastructure. In accordance with existing research, site of many universities, especially those that are within historic buildings do not meet standardized requirements and in accordance with the area to be enlarged several times. Modern academic base formed on the basis of long experience, but for reason of past decades, so for now proved obsolete for a convenient and efficient learning process. The need for qualified personnel in the state creates the need to improve existing educational funds and restructuring old ones.

Analysis of researches and publications. Successful attempts to unify and typologies planning structure of higher education were made in Soviet times. These studies have found significant problems in the system construction of schools and ways to address them. In scientific researches highlighted the scale of the territorial question-functional zoning campus, which was a significant basis for modern research. In the research of the last century was not taken into account for future social and economic changes that led to transition to reorganize the education system and educational institutions in general. The above changes lead to the need for taking into account international experience designing schools as in matters of architectural and functional organization of the territorial area. Fundamentals bases of the university designing were viewed by such scientists as Kovalskii L.M, Komarov L.K., Kretov I.Z., Rozdestvenskii D.A., Rutshteyn I.Z., Solobay P.A., Putintseva A.I., Zaichenko E.M. ,Dyadyuk V.I., Arharova I.M., Gavrilova M.M., Mahydina M.I., Manukyan D.S., Matveeva N.Y., Milinis G.I., Paperny A.B., Tarashkevych E.S. and others. Modern variety of specialties and professions caused considerable number of universities that feature in many aspects. One of those features that directly affects the university is its specialization. Therefore, the primary objective of the study is to determine the types of universities in various fields that were considered in the works Mahydina M.I., Potokina A.A., Zaichenko E.N. etc. To determine the architectural structure of the institution must first determine its units to address their functional connections on campus. This issue have been addressed by Manukyan D.S., Arharov I.M. and Tarashkevych E.S. Another problem in the development of modern universities is the territorial limits within historic center. Recent studies of H.L.Kovalska considered possible solution for sealing building schools and identify new opportunities for their development. Principle layout of different types of specialization of universities studied H.N.Tsytovych, H.Kretov and L.M.Kovalskii.

The most active period of research in the field of architectural design universities accounted for 60-80 year of the last century. This process led to the formation in Ukraine a wide range of educational institutions. Most studies, including dissertations, were held in TSNDIEP educational buildings (Moscow), in the days leading scientific research institution in the field of education buildings.

The study of E.N.Zaychenko "New types of specialized technical colleges" for the first time

in the USSR was theoretically formed the necessity and importance of the unification of the educational complexes with the scientific laboratories and production facilities. Of particular importance in the above dissertation had exactly the principles of functional planning organization these complexes. Also was proposed the optimal parameters of students, teachers and the ratio of staff research sector, and features architectural designs of universal blocks for research and educational units.

Purpose of the article. The objective of this article is the study of material and technical problems of transport profile universities and higher education institutes in Ukraine in general. As well as analysis of existing proposals for their solution.

Basic part. Education has always played an important role in the formation and development. It becomes the basis of spiritual and cultural development, the driving force of scientific progress, is an integral part of the development of modern society. A quality higher education is one of the top priorities of today's youth. According to the Law of Ukraine "Pro osvitu" identifies the main areas of educational activity. Among these should be determined:

- Creation of a modern education system that meets state standards and promote better training of highly qualified specialists;
- Selection of the leading universities in the existing network of educational institutions that train professionals to global standards;
- Promote the strengthening and development of existing universities and their cooperation with foreign institutions of higher education.

The foundation of the first universities in Ukraine according to scientists began in 1580 with the establishment of Ostrog Academy. From this moment begins the rapid development of education in Ukraine due to the emergence of a qualitatively new type of education. The university played an important role in the formation of compositional schemes cities. Teaching in higher education has always been very popular and necessary for wealthy individuals. Higher education institutions placed in the center for easy transportation. They also played a cultural role in the development of the city, so had to be close to its fast-rhythm of life. Formation of universities in central areas of cities led to their territorial limits. Gradually, education becomes more accessible, the number of students increases. We have normalized area classrooms in universities, the base of which have long formed, much higher than actual. Therefore, territorial and material-technical equipment of universities requires continuous improvement and expansion. This aspect depends on the logistical capabilities of the state and in many aspects of its development. In the years 1830-1832 was developed by Kyiv master plan, which involved a radical restructuring of the city. The need for such innovation was caused by the fragmentation of neighborhoods that had to be combined into a single planning structure. Leading role in the compositional and functional planning of University of St. Vladimir.In the XIX century.introduced the practice of similar in purpose buildings, which was the first step in expanding existing educational institutions.

This experience was used by the National Aviation University. It is an example of an active phased expansion of higher education through the use of the adjacent territory, despite placing the University in a building already formed. The birth of the University (the original name of Institute of Civil Aviation) was based on two faculties of the University of Kiev Politechnicaluniversity. The Institute was formed in 1950 of the total number of students - 1200 people. At that time the area high school occupied 4 hectares and housed in south-western part of town near the Polytechnic Institute. Over time, the number of university students increased, and extended field training areas, which makes it necessary to increase the number of laboratories. So in 1964 the area of educational laboratories increased from 14.2 thousand $m^2$to 62.3 thousandm^2. For the school allocated an additional 24.4 hectares in area, which then expanded to 92 hectares. Educational areas of theuniversity also included: radiopolihon, avtopolihon and training airfield. It is well known that in 80 years was formed a complete educational package that fully meet the technological requirements of the time. In current time necessary expansion of areas of the University is possible by to using adjacent, reorganize and sealing it.

With the development of industry in the country it became necessary to expand the network of

higher education. In the XIX century were created new institutions in Kharkiv, Dnipropetrovsk, Lviv and Kiev. There is a need for the creation of new departments and specialties. We have physical infrastructure of transport universities and universities in general is outdated and does not meet current requirements and international standards. This kind of improvement and reorganization of existing facilities and creating new resources becomes more important.

Currently in Ukraine there are 966 higher educational institutions of I-IV accreditation levels, 66 of which are of a transport type, or one of the areas where training is transport. In general, high school transport profile has about 38 thousand Ukrainian students. Of those in universities and third level of accreditation in training 5,9 thousand students in high school and III-IV accreditation 31,9 thousand scientific and technical progress leads to the need to create new jobs, expansion of existing schools. Therefore, this process is in constant development, causing the need for building new areas in schools, expansion of existing buildings and better snap.

Designing an educational institution requires solving urgent issues by placing it with the structure of the city, which directly affects a profile-oriented university. An important aspect is the solution of harmonic planning scheme of the school. Design-plan layout of the structural units of the university is determined at the general concept of comfort for communication between the various function areas under the influence of professional orientation of the university. Designing university subject to the following principles:

- Compact allocation of residential buildings from campuses and technical laboratories, ranges for practical classes;
- Expansion of the existing base of higher education by building new and expansion relative buildings;
- Referral to create modern classrooms, laboratories and specialized sites for workshops that meet-wide standards of quality education.

Before you talk about architecture and planning organization of the university should define its functional plan structure. The main components of the training set includes the following functional units: academic buildings (lecture and practical classrooms, specialized scientific and technical laboratory for technical universities), library, residential housing, dining, medical center, administrative buildings, household buildings, centers of culture and leisure, sports buildings, areas for sports in the open space. For transport university there are specific subdivisions which include research laboratories, scientific laboratories and production areas for practical training. In previous studies of the above subdivisions conditionally divided on research and educational-industrial (or scientific-production). Examples of basic layout of these areas are in development H.Tsytovych. According to the above developments, the following scheme of construction of buildings educational areas:

- centric;
- linear;
- separated;
- multicenter.

I.M.Arharov in his writings describes the building on purpose, capacity, equipment and conditions of functional processes. His studies have determined the proportion of university facilities for a specified purpose.

All rooms in the universities are divided into two groups:

1) Rooms that are not specific to university buildings, typical of public buildings in general (lobby, bathrooms, stairs, hallways, recreation, bars, administrative rooms, gyms, libraries, assembly halls, etc.)

2) Typical office buildings schools (classrooms, training rooms, laboratories, etc.), which is exactly half the total number of rooms.

Operating conditions of most of the above rooms are the same or close to universities in various fields. The specific are only 10-20% relative to special laboratories the total number of the building. Due to the great functional diversity of facilities, buildings for schools characterized by a combination of small, medium, and large areas of space. Researchers conducted an analysis of the

19 projects and universities showed (Figure 1). That the rooms is 21m^2 56% of all rooms taking with 25% of the total area of rooms is not in most educational facilities.Rooms with area of 42m2 is 17% of the total number of rooms and occupy 15% of the total area, of which more than half – rooms that are used not directly for studying. 26% of the total area occupied rooms are 64m^2 and 85 m^2, they constitute 18% of the total number of rooms and are in most educational. 9% of the total number of rooms (28% of total area) are rooms of 100 m2 or more, of which about half - education.

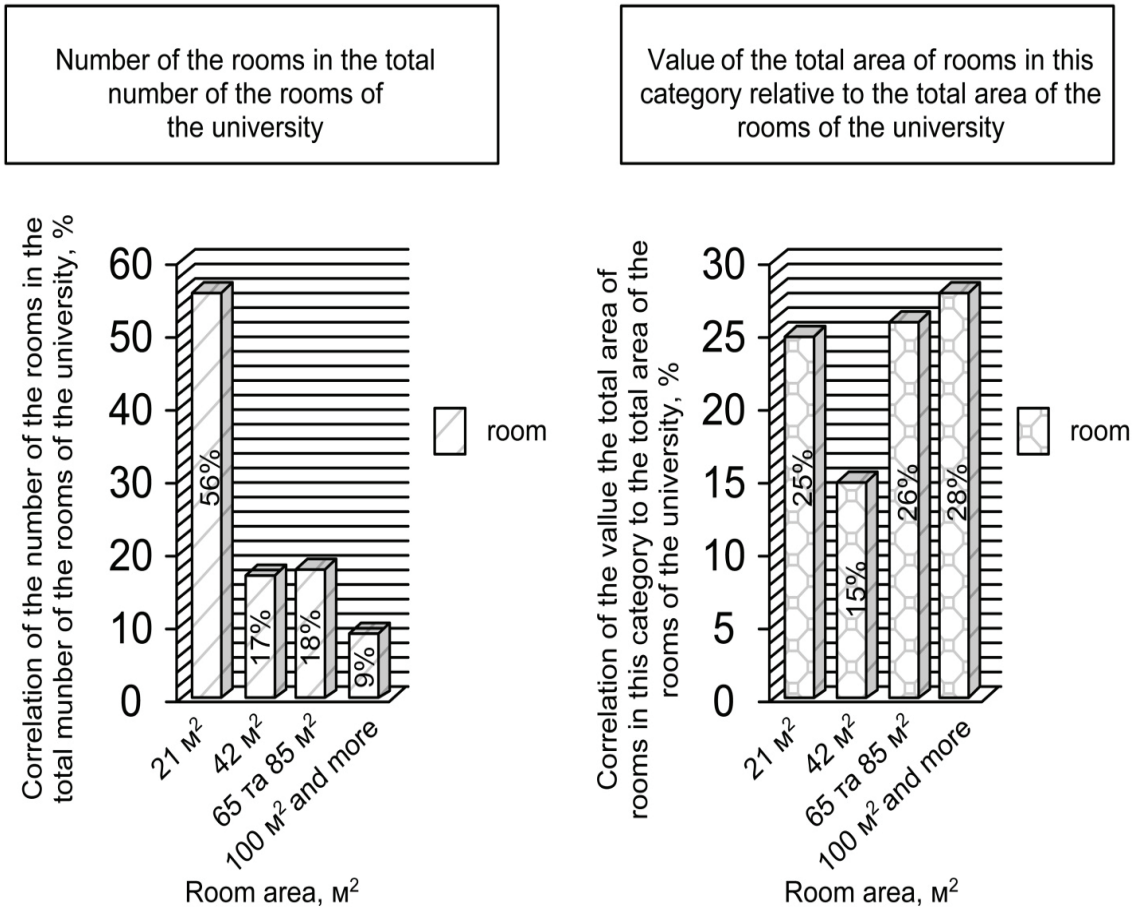

Figure 1. The correlation of the number and area of the rooms that are specific oriented to the general rate of number and area of the university complex.

Conclusions

Thus, the architectural structure of the school transport profile is influenced by the specific conditions of the learning process. Despite the general principles of formation of architectural organization of universities in general, schools transport direction dictated by their specific requirements. These features are expressed in its special territorial location in the structure of the city, the attraction to functional motor units, which allows students to receive practical experience. The comfort of placement of the functional units of the university relative to each other is one of the primary tasks of designing a modern university.

It should be noted that currently there are a number of techniques for functional and territorial planning of higher education. Nowadays Ukraine is going through a difficult time of economic difficulty, which hinders the possibility of existing research. Complicated task is the creation of new educational facilities, expanding existing technology base. Placing educational satellite cities and campuses require substantial financial costs, but because at this point is problematic. While it is important to develop these areas of higher education for future implementation.

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A.A. Khlyupin (National Aviation University, Ukraine)

INTRODUCTIONS MOBILE MODULE-TRANCEFORMARS IN AN ARCHITECTONICALLY PLAN STRUCTURE OF AIRPORTS

The problems of introduction of collapsible movable constructions of the different setting are lighted up in an architectonically-plan structure of airports, classification over of the moved constructions of complete plant readiness is brought.

Realization on territory of Ukraine of the championship of Europe on football is caused a considerable interest in the whole world, and as a result, increase of stream of passengers on all types of transport, including air. The folded infrastructure of airports of Ukraine is morally outdated and already does not provide the required level of maintenance of passengers that resulted in considerable volume in the capital investments in the reconstruction of the largest airports, to building of new passenger and freight terminals, improvement of operating descriptions of all types of commuter economy.

Dynamism of social, technical, economic, demographic and other situations causes the necessity of the new going near the decision of problems of service including commuter. Powers of existent enterprises, executed on the basis of traditional structural decisions does not allow operatively reacting on the changes of functional requirements. An operating area and carrying capacity of buildings and buildings of airports through the certain period of exploitation, as a rule, fall short of growing's necessities, to the changing forms of the processes carried out in them et cetera The decision of these problems not always requires capital building and can be limited to the temporal easy constructions of frequent turnover, allowing to make substituting or moving of all of construction or its component parts by the new place of exploitation in accordance with seasonal, technological and social necessities.

One of ways of considerable reduction of terms of putting into the operation of buildings and construction, diminishing of non-productive expenses there is development and introduction of principles of dynamic architecture, based on internal and external transformation of architectural object, conditioned functional and by aesthetic requirements. These principles are fixed in basis of planning and exploitation of buildings and buildings geometrical and spatial descriptions of which can change in accordance with requirements, in particular, for unifications or limitations (delimitations) of internal space. Such objects can:

- to come forward the mean of adjustment of necessities of air transport, to complement the volumes of existent capital structures, take into account the seasonal vibrations of cargo- and passenger transportations, in the case of exposure town-planning errors to assume without considerable expenses the transfer of object into new place, to change the type of enterprise;
- by reduction of building terms, to provide the rapid rates of update of structures labor intensiveness of erection and dismantling, compensate a difference in an estimate cost due to application of more dear and high-quality materials;
- erected in short spaces at the considerable decline of cost due to diminishing of requirement in labor resources, transport charges and etc;
- operatively to react on changes a town-planning situation and develop in the case of urgent necessity;
- to take into account the vibrations of demand on the separate types of services and operatively satisfy nascent necessities;
- to have high adaptability and flexibility on the basis of wide nomenclature of elements, allowing to build buildings in brief volume, stage-by-stage to increase power, since small architectural forms, pavilions, separate blocks, built on elements to the developing structures and centers of service;
- to change a volume and sizes in the process of editing and during exploitation, due what a

necessity disappears for alteration, tearing down, clearing of territory under new building;

- to apply due to a wide nomenclature, combinatorial and interchangeability of elements on the basis of one or a few systems by volume of-plan decisions, taking into account the size of territory, situation and hypsography;
- to carry out planning and replanning, spatial development, erect universal and various on configuration objects.

Basis of such buildings are constructions, possessing in a number of qualities, different from capital constructions:

- by inflexibility, providing durability in transversal and longitudinal direction both during exploitation and at re-deployment with the minimum decline of longevity of construction;
- by ability at transporting to reduce the volume to the minimum in accordance with stationary located in its technological equipment;
- structural transformative, by a compactness, reliability and integrity, by minimum weight at the set thermo physical descriptions;
- by simplicity of editing, that abbreviates the terms of erection considerably, because building is carried by character of assembling from the separate concerted blocks;
- sectional constructions are made on the basis of highly-mechanized technologies, production operations are added mechanization and automation, wares have a maximal range ability and minimum nomenclature of stuff details, what is the expenses of labor and cost of buildings to go down;
- by possibility of replacement of outward and internal elements at the maintainance of permanent sizes of object;
- at erection of difficult building the special supporting mechanisms allows to take into account relief of a ground, that delivers from the device of difficult foundations;
- at moving the sizes of the separate modules must correspond the sizes of freight platforms of transport vehicles;
- by the presence of the off-line system of energy providing, connecting possibility to the existent engineering's networks.

Based on analytical researches and generalization of practice of planning and building have developed by our recommendation on the use of principles, methods and facilities, providing development in time and space of mobile architectural objects of airports at the level of buildings and constructions. In this publication will consider their making elements – constructions and methods of their transformation.

Analysis of domestic and foreign experience of planning and building, patent and scientific developments allows to classify movable (mobile) constructions on basic and brightly expressed a sign are capacities for moving (pict. 1). Examining the dynamic constructions of buildings, it is possible to select three basic classes: equipped working part (self-propelled, analogical transport vehicles), with removable working part (towed) and without it (packed and container, moved on the specially equipped movable facilities, platforms).

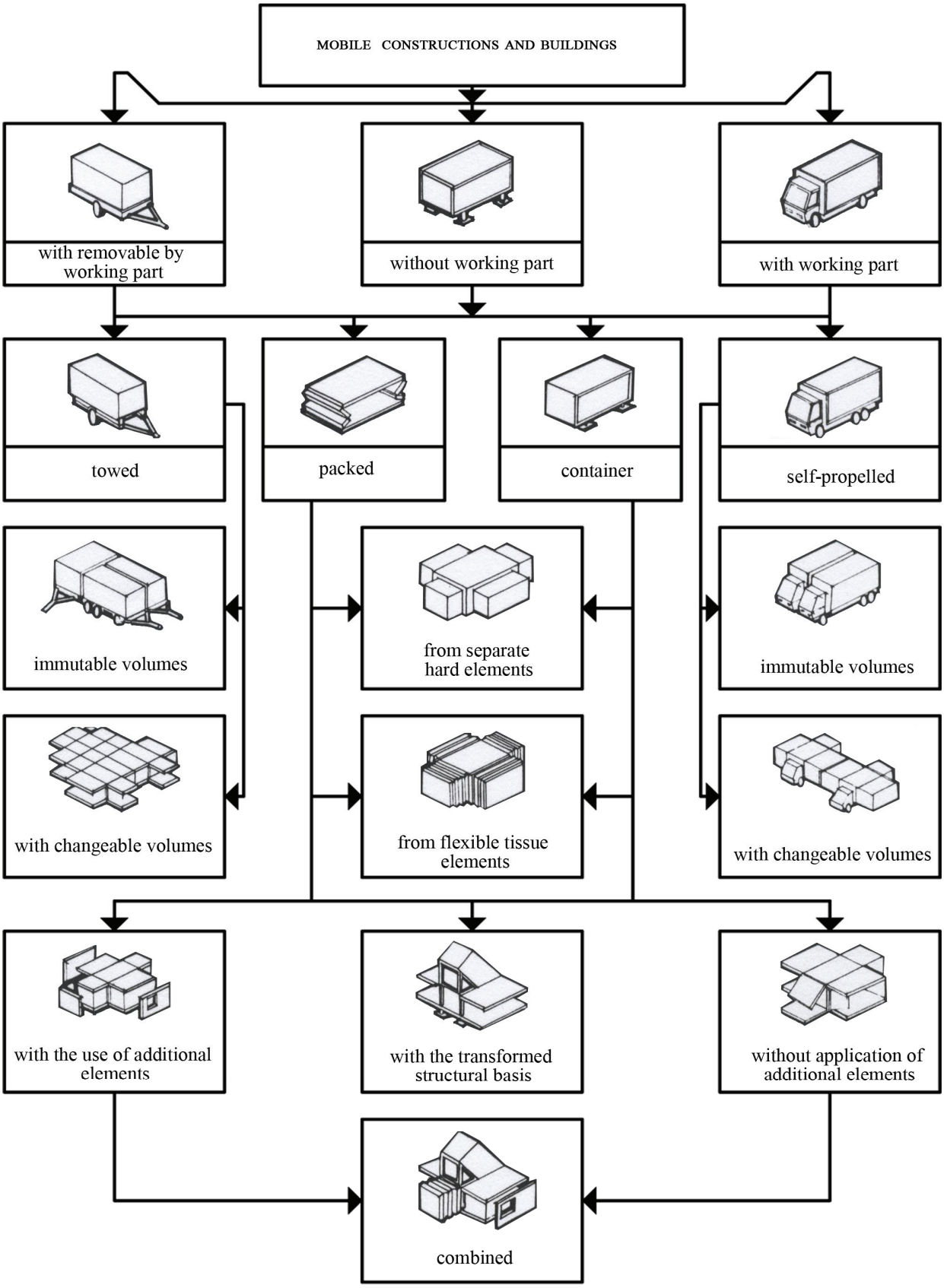
The widely widespread constructions of autobenchs behave to A-one, auto shops, auto workshops etc. In spite of their obvious advantages (high mobility, quickness of moving etc), they have a row of failings, in particular, the complete use of mobile possibilities, low comfort and high cost, is arrived at not always. During the protracted exploitation without moving working part becomes superfluous, considerably rises the price and complicates exploitation.

Many of the indicated failings the towed constructions are deprived on the base of standard undercarriages with the hard towed adaptations. The various types of the towed, semi towed elements of different loading area and level of comfort that make now.

Among movable constructions a considerable place is occupied by constructions executed, without working part, from the simplest tent to the packed transformed container block or collapsible coverage. They are divided by packed and container.

By volume constructions, executed as container blocks, are most widespread, that allows them to unify, it is better to protect from influence of external environment, at transporting and storage.

Thus they can be without difficulty transported on the large distances by the different types of transport, including international, because the module net of such systems ties down to the sizes of international container. They are made as framework, carcass covering, panel, whole shaped or volume elements.



Pict. 1. Classification mobile constructions of buildings

The packed constructions also are also widespread. Packing as ability to be folded in compact volume is an important advantage, allowing saving facilities and labor expenses at a transportation, storage and erection of buildings and construction.

Movable constructions without working part can consist of separate hard, flexible or tissue elements and their combinations:

- hard, on the basis of collapsible folding framework structure are bearings wall panels, shells and etc., joint CPLD between itself (driving to the working state takes a place as a result of the power affecting one or a few elements, that simplifies the process of assembling-sorting out and opens wide possibilities for their use);
- flexible or tissue elements are buildings of tent, awning, diaphragm or pneumatic type of different configuration and size (use them during the protracted term beside the purpose from low-level of comfort).

Hard overall limitations, that is related to aspiration to provide the maximal area of apartments at the same time diminishing of a transport volume and promote profitability of constructions, resulted in a decision to erect mobile buildings from collapsible folding constructions, allowing to change a volume and area due to laid out, moved apart structural elements like mechanisms with the use of type settings elements or without them.

Considerable interest presents comparatively the rarely applied sub-group of the packed constructions with the transformed structural basis. Incoming in it elements allow in the process of transformation to create a volume, in oftentimes excelling the volume of the module in the transported position. Application of the combined combination of a few types of constructions is possible.

The characteristic difference of transformative architecture is possibility of regular or periodic change and transformation of space in accordance with concrete requirements. Practice of planning and exploitation shows that the widest spectrum of possibilities is possessed by constructions with the different types of transformation of both separate elements and all of system on the whole. Structural features are determined by properties and possibilities of the transformed systems.

Conclusions

As an example, most full answering the requirements indicated higher can be utilized transformed module, described in a copyright certificate №1296695-SSSR. MKI 4EO; B1\343. Transformed module and developed with the purpose of expansion of its application domain due to multi-variant approach of by volume of-plan possibilities and increase of degree of transformation.

Transformer presents from itself a hard, spatially unalterable central block, cuboids with the technological equipment of the different setting stationary located in it, and suspension combined teams compartments, each of which is intended for maintenance of central block, appears the panel of floor and coverage, joint united between itself.

Introduction of transformed module of the multipurpose setting of complete factory readiness with the parameters indicated in the article can satisfy the considerable spectrum of services in an architectonically-plan structure of airports, promoting a level and quality of maintenance of passengers.

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UDC 711.4

I.V. Dreval PhD. architect., assoc. prof. (Kharkiv National Municipal Academy, Ukraine)
M.S. Avdieieva, PhD. architect., assoc. prof. (National Aviation University, Ukraine)

MODERN TRENDS OF ARCHITECTURE AND TOWN-PLANNING FORMING AND DEVELOPMENT PROSPECTS OF THE STATION COMPLEXES

The article describes the main trends in contemporary urban architecture forming station complexes - the important structural and functional elements of the urban environment. The conclusions about the prospects for their further development in the city structure.

The development of urban environment at the regional and agglomeration levels are closely linked with the improvement of the relationship of the individual territorial complexes by transport and communication networks. Nodal elements of multi-city transport network serving the passenger flows, defined as the station complex (VC). Among them are rail, bus, marine, river, railway stations combined complexes, airports. Today VC of different types and grades are an important element of urban areas, a significant factor in its functioning and development. This kind of "gate", from where the familiarity with the city of the country. Station complex vary according to functional, structural, spatial parameters. Improvement of their architectural and urban planning organization - an important task, especially for Ukraine, in the context of the prospects of entering the country in the European Union. The study of trends in station complexes expands the predictive view of their further development in the modern world. This determines the relevance and purpose of this paper.

Different aspects of the problems of urban architecture and the formation of station complexes were studied by scholars such as V. Batirov, E.V.Vasilev, GE Golubev, K.Hertseg, O.SH. Ter-Voskanyan, I.G.Yaveyn and others [1-5, 11-13]. They discussed various aspects of the functional planning, organizing compositional VC, especially their location in the structure of the city. However, the identification of current trends in station complexes requires analysis of actual experience. Interest in this question has already noted in the literature [10].

Based on a study of the world of design and experience creation and reconstruction of the station complexes identified the main trends of development in transportation and technology functional, structural, compositional, environmental, economic and ergonomic aspects.

In the transport aspect of the observed increase in the concentration of the processes of transport communications of various types and ranks in the node, and their active cooperation. For example, in Seoul, a new transport terminal combines the airport, 2 and 2-speed conventional rail lines. The central VC in Milan includes: railway station, bus station, city air terminal, station, two subway lines, underground parking, helicopter landing station. Objective tendency of cooperation of the various modes of transport in the nodes of transport and communications framework leads to the formation of the combined station complexes (rail and bus, rail and sea and river-, air-bus and rail). This process causes the constant technological modernization of the VC, which implies that, in turn, the need for their ongoing reconstruction [8].

In the functional aspect, it should be noted the growth of the functional diversity of the content of VC with preservation of the leading transport and communications functions. The world is becoming common practice, when the present structure of the VC function blocks such as: hospitality, retail, entertainment, exhibition, news, office, recreational, service and spiritual activities. For example, in the structure of the new VC of the central Berlin has about 80 stores, a hotel and office space, parking for 860 cars. In Montreal, the structure of the reconstructed center of the newly formed VC includes three department stores, four hotels, five office buildings, 8 cinemas, 30 restaurants, parking for 9,000 jobs [14].

Thus, we can talk about sustainable development trends on the basis of VC multifunctional public transport systems. This trend is reflected in the enrichment of the concept of an external node of passenger transport. VC became synonymous with terms such as "multi-functional public

transport sector", "multi-site transport interchange," "mixed-use complex external transport", "multi-passenger terminal."

In the structural aspect of the formation of the VC is the formation of complex multi-level structures, which include ground, aerial and underground space blocks, connected by a system of vertical and horizontal communications. Thus, at the Waterloo station in the capital of England has four levels. In Singapore, the station complex Dhoby Ghaut - the deepest underground terminal with 5 levels. The structure of the terminal VC West Kowloon district of Hong Kong consists of six levels, including two underground stations. It should be noted the tendency of the spatial "convergence" of communications elements of different types of transport, interacting in a node, which helps reduce the time passengers transplantation and is manifested in the formation of core transport and communication sector. Increases the degree of integration of the majority of station complexes in the space-planning structure adjacent buildings. (The exceptions are airports that are placed at a distance from urban areas to technological requirements). Thus, many railway station complex are no longer objects, dissecting the urban fabric, combining the previously separated urban areas through aerial platforms that cover the station. As examples Station Purdue bridge in Paris, the draft of the new VC Shtudgarde. It should be noted trend of increasing similarity of structural and functional organization of the VC of different modes of transport, which is expressed in the likeness of: restricting access to the platforms, passenger check-in and luggage delivery; leisure while waiting for boarding.

In the compositional aspect of the pronounced tendency of formation of VC as urban ensembles, occupying large areas. Thus, in the Lille architect Koolhaas designed megastructure, which occupies 40 hectares, in terms of modern building dominating compositional ensembles station complexes are not passenger building (as before), and office buildings, hotels and even a television tower in Kyoto (Japan) [6]. There is a growing variety of personalization and humanization of technical space VC. These structures can be found sculptures, elements of landscape design and maintenance, special means of visual communication. Currently, EC is increasingly performing presentation, image-feature to the city. This trend can be detected even in small towns. For example, in Ukraine, in the passenger building g.Chugueva VC (the birthplace of the famous painter Ilya Repin), an exposition of copies of his paintings. On the passenger station platform Gogolevo (near the family estate of the writer Nikolai Gogol), established his sculptural sculpture. The image of cities and major towns is embodied in the original architecture and scale of station complexes.

The environmental aspect was a trend of active use of techniques to improve microclimatic characteristics of the VC by increasing external and internal spaces of the number and variety of natural ingredients. As an example, should lead VC in Osaka (Japan), where small areas created terraced park, connected to the passenger station above ground transitions. The structure of the new Berlin Central Station provides beach and recreation area on the banks of r. Shpree. In Kharkov, a pedestrian forecourt revived park with a fountain. The trend to reduce development pressure on the environment from the VC, which is accomplished by the use of innovative technology in their construction and reconstruction.

In the ergonomic aspect of it should be noted the tendency of formation of the VC space with a high level of comfort for the implementation of the various groups of passengers and staff. Notably the creation of an enabling environment for people with disabilities (limited) possibilities. Formation in Europe today a unified network of railways led to the introduction of general principles of structural and functional organization of the process units station complexes, which greatly facilitates the orientation of the passengers.

In the economic aspect of the growing trend to minimize operating costs through the introduction of innovative technologies of energy conservation, improve the compactness of the functional blocks and the communication network, expanded involvement in the structure of the VC additional features to enhance their profitability. Thus, the formation of EC Railway in Belarus made up 40% of take under the deployment of public services [9]. In Berlin, the VC is allocated for commercial use 21% of the complex [4]. Accommodation in the structure of the VC function blocks

of public service can complete its target much of the movement of passengers. Getting the necessary services to passengers who arrived in the area walking distance (ie within the VC) eliminates the need to continue their journey through the city. This reduces the load on public transport, reducing overall energy consumption. The device major hubs linking stations of different lines of one or more modes of transport that has become characteristic of many developed countries, the VC is economically advantageous for network operators.

Analysis of trends in VC as elements of the urban system, revealed a main of them. First of all, is the tendency of formation of the VC hierarchy depending on their locations in the zonal structure of the city. In the central part of the city railway and bus located the VC serve interregional and regional reports, in the middle zone - VC serving line of medium-range (local) in the peripheral zone are placed VC, serving commuters and performing as a kind of "interception" of trade and domestic workers [11]. Station complex air transport stir outside the buildings of the city, but have a railway or bus connection to its center.

The second important trend is the combination of network nodes of transport and communication framework of the city with a network of centers of public service. This tendency is especially evident in the largest cities, having in its structure, different types of external and intra transport, as well as performing the functions of regional and agglomeration of service. Thus, the current VC, serving the regional transportation network, including in its unique structure of the complexes of the public service of regional importance. VC, serving meat and suburban, have in their structure functional blocks of the public service ranks [5,11,14]. This trend contributes to the functional significance of station complexes. However, Ukraine is currently forming part of the VC occurs spontaneously. The third trend in the development of VC in the urban system is the strengthening of their city-forming role, which manifests itself in an active influence on the functional plan structure of the city and creating a new type of territorial formation - areas of innovation development of the city. These objects are called "city within a city" [7,8].

Conclusion

Based on the analysis of these trends shaping contemporary station complexes, the following conclusions about the prospects for their further development:

1. Station complex in the future will be based on functional and spatial relationship of the two main elements: the node communications (external and intra-) and node (center), public service of a certain rank. This relationship is due to the integrity of the process of life of society, the slave laws to minimize energy consumption and time. The formation of the modern VC is a manifestation of systemic morphogenesis, which makes the union of elements of the network of public services and transport in a qualitatively new system.

2. VC transformed into a multifunctional, highly technical, tiered superstructure, which performs the important function of life support of the city, metropolitan, region. The development of the VC associated with a higher degree of compactness of its core communications and increase the area of reconstructed areas in their area of influence. Improving the VC reveals the possibility of solving some urgent pressing problems of the city: the intensification of use of the area, ordering the functional organization, the formation of expressive architectural design.

3. The prospects of further development of the VC associated with the transition process of urbanization of concentrating extensive stage intensive decentralized. The development of transport technology enhances speed of communications between the settlements, the comfort level visits. It will inevitably stimulate inter-settlement transport mobility of the population, and hence the need for further development of the station complexes. Improved construction technologies and improve environmental safety VC urban development will increase the flexibility in their placement in the structure of the city, a variety of architectural and urban morphogenesis.

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N.K. But, senior lecturer (National Aviation University, Ukraine)

USES OF MODERN TECHNOLOGIES IN THE RECONSTRUCTION OF URBAN SPACE

City environment serving, communicative serving, communicative and socially-cultural functions are realized in behaviour of people depending on conformity of qualities of space to public demands. That's why the usage of meaning landscape design finds additional sense for those qualities of the city environment, which are made for conditions for normal movement and dialogues of people taking them of services and information, leasure time activity and art.

The aspiration for stabilization in course of environment changes allows to consider components of the nature as means of transformation of city spaces, submitting to functional orientation of the a person's behaviour. In this connection maintenance of gradation of qualities of spaces (static - dynamical, opened — closed), is equal as achievement of a variety of their configuration (linear, compact), become a content of landscape design of the city environment focused on giving option in behaviour of people with various individual requirements.

Thus in the landscape design considering reasonable public demands, lies the chance of achievement of functional orderliness of city spaces, that is one of the major qualities of the environment, directly connected to its quality.

In process of progressing of large cities and the appreciable deterioration of a condition connected to thereof, there is a comprehension by mankind of inevitable ecological priorities and their indispensability at formation of orientation in the surrounding city environment. As a result of dynamical process of a urbanization and not always rational use of natural resources many cities, first of all the largest industrial centres of Ukraine, have approached to the beginning of the third millennium in a condition far from prosperity from the point of view of ecology, the comfortable city environment assisting convenient course of various processes of ability to live.

In that way the indispensability of complex research of the urbanized and natural systems with the consecutive analysis of their elements influencing orientation in the city environment as a whole noticeably increases. Only by system consideration of problems of interoperability of city with the changed nature in its structure and an environment possible means of perfection of the city environment can be found. Landscape design as one of dynamically developing areas of creative activity of the person on formation of its adequate environment, inevitably appears in the center of similar research as possesses greater non-realized possibilities [1].

For modern cities of Ukraine, especially large, the problem landscape and architectural maintenance of orientation more and more distinctly acts.

Rhythms of the variations undergoing by the city environment change also forms of their site plan development that requires constant philosophical comprehension and new forms of maintenance orientation. And, in given conditions, for convenience of site plan activity, for the first, it is necessary to maintain a certain level of communicative qualities of environment, creating that a subbase for the general environment orientation, and, secondly, there is need of means turned to reason of focusing subject. Functions of such means should carry out a special informational mediator that is the means of the visual communications, which reflect structure and senses of environment.

Thus, landscape and architectural maintenance of orientation is the two-scheduled problem requiring coordination of means that have been involved. From two types of these design activity for a city (architecture and design) the architecture by virtue of the established traditions is really involved in the solution to the problem of orientation. However, as it is established in town-planning researches, the majority of receptions of orientation traditional architecturally practically does not work in modern city. Initial systems one step at a time lose the value in the complex environment of the central areas of large cities, and practically are not built in the Wednesday of new areas created on other town-planning basis. As to the advanced large-scale receptions landscape decisions of the orientation, developed new residential areas they with a special acuteness require support in fineer scale of subject filling of environment.

Objective of research began - to open possibilities of increasing of potential of the environment of modern city means of landscape design and to draw appropriating methodical conclusions and recommendations for various levels of design or reconstruction of the city environment, carried out by city design or with its participation.

Research problems following from here:

- revealing an actual problematics of maintenance of orientation in modern large city;
- disclosing focusing properties of landscape design and research of orienting laws development of the city environment;
- development of a procedure of natural inspection of the city environment with objective of revealing of focusing qualities of landscape design and a level of its equipment the focusing information;
- development of receptions of the organization of the city environment by means of landscape design, including the visual information, with objective of improvement of conditions of orientation;
- development of principles of formation of information systems of orientation of landscape design.

The theoretical base of the given research was developed on the basis of the realized projects in the field of city landscape design and visual communications, as well as works on the theory of orientation, town-planning, philosophy of the city environment.

The reference of town-planning to area of the visual communications in Ukraine for last years has coincided with rapid development of landscape design for public area in general. The Most successful became experiences of creation of systems of the focusing visual communications for local objects (monofunctional and territorially limited). However and the problem of orientation in the complex environment of city has been solved by this area only partially: the systems of the visual communications introduced in open city space, mostly were not effective enough That speaks first of all an insufficient level of scrutiny of modern processes of city orientation and, accordingly, impreparation of experts on landscape design to the decision of the questions connected with a specific character of city and orientation in it, the problem of orientation at a theoretical level rose while only in the town-planning literature in connection with questions of architecturally-art shape of cities, psychologies of perception of city space, psychology of orientation (Lavrov V.A., Kulaga L.N., Regame S.M., Ikonnikov A.V., Sokolov С.И., Beljaeva E.L., Kostrikin N.D., Puppies A.C., Barabash K.B.Lynch, Appleyard,Klapare, Til, Simonds, Hanssen), as well as in the literature connected with questions of philosophy of formation and progress of the city environment (Lezhava I.G., Rozin V.M., Bokov A.V., Rappaport A.G.) Also problematical character of use of the basic means of visual communications of signs on visually-graphic language in the city environment. Therefore as a whole on landscape design maintenance of orientation in the city environment of our country cannot consider an existing situation satisfactory [2].

Today landscape design of Ukraine as one of types of land-oriental activity in city represents a following picture:

- it has to be noted the general increase of production of landscape design in the general communicative structure of environment;
- mobility and flexibility of that layer of environment to which the landscape design concerns, gradual submission of all architecturally-subject filling of environment to area of design design. These circumstances allow to talk that landscape design may become leading activity in a question of maintenance of orientation due to management of subject filling of the city environment as special means of the visual communications also are its product.

In this connection purposeful and complex use of means of landscape design for maintenance, orientations and organic entering into the city environment of the visual information really valuable from the point of view of orientation, can be considered as new understanding of a problem of maintenance of orientation in the environment of modern city. With objective of revealing of approaches to the decision of design aspect of a problem of maintenance of orientation the given research opening features of modern city as the environment of orientation, law of course

of processes site plan activity and a specific character of modern means of maintenance of these processes also was generated.

Carried out research has enabled to define the general strategy of the design approach in a question of maintenance of orientation in the city environment and to establish its conformity of general strategy of the design approach developed now ("seats" and "networks") in area of city design. The design approach contains in a question of maintenance of orientation two complementary design strategy: the spatial strategy consisting in maintenance and increase of focusing qualities of seat, and the functional strategy concerning the organization of special system of means, providing coherence of informing of functional processes of orientation in city.

Within the limits of the spatial approach the main task is to increase site plan potential of allocated surroundings integrity. In a type of that the seat represents complex unit for design development, the idea of the complex approach to the decision of programs of orientation is represented to the most fruitful. Levels of the decision of these programs depending on attraction to design of design and architecturally-town-planning services are allocated. The first and second level mentions only entering of systems of the focusing visual communications into the reconstructed or again created environment. Design of all subject filling of the environment is involved in the third and fourth levels, carried out by forces of design of environment. At the fifth and sixth levels in the solution to the problem of orientation join also means of architecturally-town-planning design. In the maximal version increase of focusing qualities of environment (imagining, apprehensibility, the visual articulated and information equipment) is reached under condition of: I) the brought problem of orientation to a level of architecturally-town-planning design; 2) tasks of focusing properties as secondary function to all subject filling of environment; 3) introduction on Wednesday of special means of the focusing information reflecting its structure and senses.

For the complex decision of the program of increase of site plan potential of seat scenario approach may be used which may provide the maximal approximation to vitally-actual situations of orientation. Scenario approach is understood widely: as a system of construction of the script, carrying out of direction of site planning and the subsequent scenographic development site plan stage settings. Topics development serves to maintenance of site planthe action consisting mainly in movement to objective and passing contacts to Wednesday. Progress of action is under construction accordingly structurally-activity to a subbase of the given fragment of the environment considered as site plan integrity, i.e. having the reference points and vectors of activity. Disclosure of structurally-activity subbases - the main task of the scenario development, which may be solved by various working methods with all subject filling environment: by the city equipment and elements of an accomplishment, by color graphics and by means of the visual communications.

Within the limits of the functional approach (network strategy) set of the special news media providing spatial and objective (semantic) orientation in city, is considered as uniform system. At work on such system solve questions of semantic and visual coherence of the focusing information on city as a whole. Therefore local systems are considered as a part of city system of the information for orientation. The content of an information material for orientation should be divided into categories depending on oriental situations that are served by its oriental situations: a situation "city" and a situation "seat".

Within the limits of the functional approach one more of problems of city system of the information for orientation - maintenance of identification of objects of mass city service is solved. We consider this problem as a specific problem of graphic design, as graphic (symbolical, pictographic) the designation of objects of city has an objective basis in a modern situation: because of an indispensability of translation of messages on objects of city in various information channels: indexes, guidebooks, cards, diagrams, etc. orderliness of these messages remains a constant problem. As one willows of possible and most proved methods of attack of a graphic designation of all set and variety of city services ordering of all conceptual set of messages on them to a functional sign is offered. As a basic basis, visualization of information senses the conventional application of the graphic symbolics fixing hierarchy of systematized senses is offered.

Realization of spatial and functional design strategy by virtue of obvious distinction of

approaches and the involved means, as well as significant internal complexity of each of them, cannot proceed simultaneously, and apparently will demand realization by their various design services or divisions. Both of type of development require constant coordination and periodic cooperation of services for reception of the coordinated decisions.

It should be noticed, that the majority of the listed directions environment perfection assumes use tree-dimensional the parameters of natural components of city space possessing as greater (in comparison with plane) possibilities of regulation of qualities of environment, and, as well, considerable reserves from the point of view of ensuring of its esthetic expressiveness.

Taking into account that an ultimate goal of enlarged uses of landscape design in the city environment is maintenance of correspondence of its qualities to changing public demands, one of leading roles in achievement of such condition the system of reflection of these demands as alternative to destructive influence of the normative approach and constraining influence of regulations, instructions and managements is called up to act the part.

Research has shown, that the modern city environment appears at a guided person in a special foreshortening: the semantic side of environment renders often stronger influence on construction oriental concepts, than visual. Therefore spatially-visual integrity of separate fragments of the city in activity on orientation is often transformed to other integrity, with other reference points, other centers, periphery, the accents arising on the basis of special site plan of reference points, outsets and outcomes of action. Other feature of the modern city environment consists that except for an architectural framework the increasing influence on oriental perception and development of environment renders subject filling environment (products of design, elements of an accomplishment, small forms of architecture, color graphics, elements of gardening, etc.), Visual qualities of this concreteness and its semantic content. Often, subject stuffing influences on oriental perception more actively, than an architectural environment. The third feature consists that for orientation in the modern city environment practically the information intermediary permanently is required.

At the moment design for orientation, contains two basic levels: within the limits of architectural design programs of visual orientation are under construction, thus large-scale receptions of the organization of environment are used; within the limits of area of the visual communications special systems of the visual information for orientation are designed. Both of a level of design provide only partial decision of a problem. Active inclusion of means of design of the city environment is necessary for purposeful management of all subject filling of environment in which a plenty of products of design is concentrated, with objective of increase of its focusing qualities.

Research has shown that spontaneously already there is a reference, both from architecture, and from design of visual communications, to use of elements of subject filling environment for objectives of orientation. However reserves of design of the city environment as the leading link, capable to operate all this concreteness, practically are not used yet and consequently transferring the centre of gravity to the decision of this problem in area of city design is required, that does not remove the specific problem of the designer-chart consisting in entering on Wednesday of means of the visual communications:

The basic properties of seat integrity are defined as:

- availability special structurally-activity subbases;
- foot depth;
- a possibility to define conditional "borders";
- integrity on activity;
- integrity on site plan concepts;
- calling of places;
- a special psychological climate.

Environment site plan integrity are systematized in research on the basis of a structural structure (on an example of territory of Kiev): variations structurally-activity subbases, the welfare status and some qualitative characteristics depending on an arrangement in territory of city (is closer

to the center or to periphery of city) are shown. In research features of course site plan processes inside of such integrity are opened, principles of revealing of "focal points" orientations to territories of seat are established.

Research establishes the basic site plan qualities of environment: possibility to imagine and approach, visual expressiveness and information equipment, and by means of specially developed complex procedure of natural inspection (on an example of Kiev) is revealed their dependence from of some the properties of environment assisting orientation. It is established, that regulation of these qualities can mainly be carried out by design of the city environment.

The procedure of natural inspection of the city environment by means of which the sites of environment representing site plan integrity (seat) come to light is developed and are estimated them site plan qualities. The procedure is maybe used at a stage of predesign researches for cases of reconstruction of the city environment by means of design or with its participation.

Bases of construction of programs of increase of site plan potential are developed for fragments of the city environment in the status of seat as site plan integrity.

The primary goals of landscape design in such programs are: I) maintenance or forming of precise vectors of activity; increase of an originality of environment (a fragment as a whole and separate objects); 3) strengthening and underlining of the general structural clearness of a structure of space, the basic ways and units of movement; 4) contribution "habitability" and semantic fullness of environment; 5) programming of sequence of visual orientation on the basic routes of movement (at coordination with the architectural program of visual orientation); 6) assistance to general visual marking out of landscapes and dramatization of visual plots. Within the limits of programs of increase site plan potential receptions, principles and approaches of century are offered to work of the designer on subject filling environment, including scenario approach at the most assisting reconstruction of vitally-actual characteristic situations of orientation in the specific environment. The principle of distribution of the focusing information within the limits of seat (strictly according to the installed laws of course of site plan process is offered to activity in it), consisting in a concentration of various types of site plan information in appropriating focal points of orientation of integrity.

As a whole the approach of maintenance of focusing qualities of seat provides the way to assist forming of figurativeness of perception of fragments of the city environment and by that, to assist its aesthetic perception. Work of the designer "on seat" is correlated in research with the spatial design approach of maintenance of orientation.

Conclusion

The co-subordination-design situation which has developed to the present time also will demand restructuring. Transferring the centre of gravity to the solution to the problem of maintenance of orientation from area of the visual communications in wider area of city design, and whenever possible, complex design of environment first of all is required. It is necessary to provide the harmonious actions of the designer-chart, the artist-designer of the city equipment and the designer of environment, on the one hand, with the architect and the town-planner with another. Closing up of design levels in work on uniform complex object (as a fragment of environment) will enable to put and solve the problem maintenance of orientation at various stages of design development more precisely.

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I. Kuznetsova, Professor, doctor of art criticism (NAU, Ukraine)
N. Iida (College of Industrial Technology, Japan)
S. Klein (NAU, Ukraine)

MEANS OF PROVIDING THE FEELING OF SAFETY FLIGHT IN THE AIR TERMINAL INTERIOR DESIGN

It analysis development of air terminal complex design from 1920 year of twentieth century in to our time. Tendencies interior design the best airports in the world to specify modern means of providing safety of flight and organizing terminal space.

The role of airports as the elements of air transport system in the country is steadily increasing. More and more people use airports each year.

Today, the best airports of the world are trying to attract the attention of passengers by providing them the most comfortable conditions of staying and to organize a range of services and facilities that may be responsible for high-quality leisure activities within the airport complex. All these facilities must be sustained in the general form of the terminal and meet the highest aesthetic and comfort level. This gives rise to greater development of design technology and constant evolution of the medium terminal.

Since the second half of XX th century carried out comprehensive studies of airports. Blokhin V., Komsky M., Piskov M., Chadayev A., K. Nigl and others explored the exterior and interior air terminals [1, 3, 5, 6]. The current state of science requires a systematic approach to the design of terminals and interior design knowledge of modern materials and technology. In particular, Knight P., Gubina N., Morzunova I. studied the problems of modern nanotechnology and nanomaterials [2, 4].

Purpose**:** determine the perception of modern means of providing feelings safety in the interior design of the terminal by analyzing the experience in interior designing airports.

The boundaries of the research interior design of terminals from 1920 year of twentieth century till 2012.

Creating interior design public buildings based on the following purposes:

- providing comfort,
- the creation of aesthetic impression,
- providing feedback corresponding status,
- the creation a definitely an artistic image.

Airport – is a "Face" of the country that welcomes a passenger from the aircraft. Design of the terminal must meet the latest trends provide comfort and aesthetic requirements for creating a positive impression and identify status.

Many successful examples of interior design terminals generally focused abroad in well developed countries. For example, Beijing international airport in China, the new terminal Heathrow in Great Britain, Canada, International Airport, the airport in Madrid (Spain), the Uruguay international airport, the airport in Shenzhen (China) and many others.

Research of foreign experience designing airports showed a tendency to create a unique image of the terminal facilities interior design (Table 1). Based on the rating "The best airports of the world" in 2011 by the authors of this report analysis. It showed that the status of the airport depends on the internal filling space next:

- modern systems and technology design;
- quality and originality of the interior;
- by the presence definitely an artistic image airport;
- providing a positive psycho-physical condition using medium color gamma;
- creation of an open organization and space decision;
- a plenty of rooms for different purposes that make the leisure time provided by passengers during flight delays, etc.

Table 1

Table analysis of special complete sets that show the status of the best airports in the world

The best airports of the world	Special complete															
	Internet cafe	Restaurant	Business centre	Sport centre	Pool, sauna SPA	Children's room	Excursions	Museum	Moving on electric cars	Gardens	Golf field	Casino	Disco club	Bowling	Rest rooms	Artist scene
Narita (Tokio)	+	+	+	+	+	+	+	+	+	+	-	-	-	-	+	-
Changi (Singapore)	+	+	+	+	+	+	+	+	+	+	-	-	-	-	-	-
Franz – Josef –Straus (Munich)	+	+	+	+	-	+	+	-	-	-	+	-	-	-	-	-
Shiphol (Amsterdam)	+	+	+	+	+	+	+	-	-	-	-	+	-	-	-	-
Harstfield (Atlanta)	+	+	+	+	-	+	+		+	-	-	-	-	-	-	-
Kingsford Smith (Sydney)	+	+	+	+	+	-	-	+	-	-	-	-	-	-	-	-
Frankfurt (And Frankfurt am Main)	+	+	+	-	-	-	-	-	-	-	-	-	+	+	+	+
Inchon (Seoul)	+	+	+	-	+	-	-	-	-	-	-	-	-	-	-	-

In designing the interior terminal important element is a providing the psychological state of the passenger before departure. That's why, airport interiors should be easy to read, filled with light and dynamics, modern equipment and technology.

Analysis of the artistic image, created by the design of the airport generally, shows the use of global and national characteristics in the design. Analysis Patalaha N. essentially globalization principle design showed the presence of dynamic and light elements in the interior, such as wave, solar beam, cloud. These art images help you tune into flight.

National principle used differently in each country. Uses the well-known features that characterize this country. For example, the stylized images of world famous paintings of the great Dutch masters in black and white picture on the walls of a cafe uniquely identify terminal in Amsterdam. You can read the overall concept of the Dragon at the Beijing airport. That is the modern means to provide safety flight perception in the interior design of the terminal in the context of the artistic image, that shows two trends. One trend focuses on the challenge to the desire of flight, the other - to divert from the flight.

New technologies are important in designing of terminal. Their use allows you to enhance and enrich the range of additional visual and functional effects. To provide a high level of interior design airport is appropriate use of technologies of the XXI century:

- nanotechnologies and nanomaterials in the decoration of the room surfaces (with antibacterial and self-cleaning properties);
- technology computer design and digital programming of machines, that can help create a unstandard form in filling of interior;
- technology of casting furniture under high pressure of modern materials (such as magnesium, fiberglass, plastics);
- hologram projection image;
- the use of robotic interior filling;
- the use of systems objects transformation of furniture in the interior;
- use new features of modern lighting, such us compact RGB lights.

Development of new materials always promotes new shaping in design. Design concept of the XXI century is to find new forms and new aesthetics. In the last decade the shape of objects innovative design becomes more simple and concise. Formed process of interaction between new materials and the desire of designers to implement ideas. Use of technology casting of polymer materials, plastic, makes it possible to get organic forms that the greatest degree corresponding to the morphology of the human body. This provides a comfortable tactile feeling using a furniture that is so necessary at the airport. Support for rapid development of new materials and technologies provides creative design work, which pushes scientists and engineers to find new ways to implement their creative projects and ideas. Hologram projection images can be situational information, tied to the flight, for example - scoreboard and information - travel, for example - the projection of Kiev-Pechersk Lavra or Sofia in Kiev.

Today there is a problem in using transforming design objects that can open new possibilities in design planning space for stays of many people. Developments so-called "Transformers" provide economical and efficient use of floor space, especially at the terminals. The authors of the report, identified options for design object in airports interior that are transformed (fig. 1).

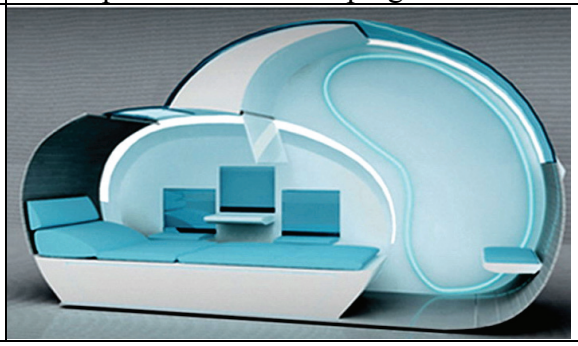
Conceptual model of chairs - transformer	Conceptual model of sleeping module
	

Fig. 1 - Transformable design objects to the proposed Klein S. (head I. Kuznetsova I.) of the draft airport in Yalta

No less important is the issue of lighting. Lighting terminal should be clear so the person wanted to hover above the ground. In addition, with the help of lighting can be improved airport zoning area.

Conclusions

1. Analysis of the decoration and additional rooms (theaters, business centers and so on) and the «vip» rest rooms showed that the detection status of the airport depends on the use of the latest systems and technologiesand provide maximum comfort at the airport.
2. Determined the feasibility of using new systems in the planning airports interior design, such as nanotechnology, technology, molding and furniture finishes, hologram service, intelligent systems, robotic filling the interior, using new features of modern lighting.
3. Special attention in the design of interior air terminals should be given transformation of systems design - objects.
4. Artistic image of the terminal interior for providing the feeling of safety flight, regardless of national or globalization characteristic determined by two modern trends. To providing the feeling of flight safety in the perception of interior design, one tendency focuses on a creating desire to flight and the other - a intellectual distraction from the flight.

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V. Kolpakov, professor
O. Ivaschenko, Post graduate student
(National Academy of Interior, Ukraine)

COOPERATION FOR PREVENTION OF TERRORISM

Study the problem of interaction of the state administration in the management of subjects to counter terrorist acts. Are presented to a means of improving the methods and forms of cooperation in combating manifestations of terrorism in the modern world.

Today the world community, with great concern, observes the process of activation of international terrorism, which consists of the threats and realization of large-scale terrorist attacks that are directed at the distribution of atmosphere of fear and panic, political and economic instability and discrediting of the democratic principles of human existence.

Terrorism became one of the biggest threats to national safety of the states and international safety as a whole. Globalization processes have brought internationalization, transformation of ideological and institutional base of terrorism, and substantial expansion of its forms and methods [1].

Attempts to perfect already existent mechanisms of counter-terrorism, develop new effective forms and methods of fight against terrorism, and increase the interdepartmental and intergovernmental levels of co-operation on bilateral and multilateral basis are urgent for each of the states.

The active foreign-policy activity of our state, participation in numerous international actions, including counter-terrorist actions as well as the number of external and internal factors, coincide with an increase in the probability of terrorist attacks on the territory of Ukraine.

The analysis of modern progress trends of terrorism shows that internal social processes, which could produce the terrorist manifestations, are steadily displaced to the sphere of international relations and exactly external factors create the real threat of expansion of this most dangerous socio-political phenomenon [2].

Working out the strategy and tactic of fight against terrorism, Ukraine realizes that threat of expansion of international terrorism is a global threat. By our estimations, in spite of the liquidation of its separate centers in the Central Asia and in the Near East, as well as blocking of its basic financial sources, the threat of terrorism grows yet and because it takes new shapes and comes running to new methods of actions, using the last achievements of science and technique, new possibilities are opened in connection with integration processes in the world, by intensification of international contacts, growing of migration processes and indulgence of control at the crossing border check points.

Even in the situation of absence of information in relation to the real threats to Ukraine from the side of international terrorist organizations leaders of the state pay the principle attention to the settlement of questions in relation to forming of the effective national counter-terrorist system [3].

Ukraine has acknowledged the fight against terrorism as one of the priorities of its state policy and is in process of active policy making for providing the effective countering to the terrorist manifestations.

In accordance with resolutions of Security Council of UN №№ 1267 and 1269 (in 1999), 1333 (in 2000), 1363, 1368 and 1373 (in 2001), 1388, 1390, 1438, 1440, 1450 and 1452 (in 2002), 1455 (in 2003), 1526, 1566 (in 2004), decisions of the International regional summit on fight against terrorism, that took place on 06.11.2001 in Warsaw, Declaration on the issues of fight against terrorism, which is approved by resolution of UN Security Council № 1456 (in 2003), and also taking into consideration Declaration on the fight against terrorism (with addition it is the renewed Plan of actions in relation to the strategic aims of European Union in the sphere of fight against terrorism) and Declaration about solidarity in the fight against terrorism, accepted on meeting of European Union (Brussels, 25-26.03.2004), on implementation of commissions of the

President of Ukraine and the Government of the state, as well as the other decisions accepted at international and national levels by Ministry of Internal Affairs of Ukraine, within its competence, the complex of the organizational and practical measures directed on the fight against terrorism, non-admission of the expansion on territory of Ukraine of international terrorist and extremist organizations gets along.

For the last years Ukraine joined all basic international conventions and the protocols to them) on the fight against terrorism and organized crime, in particular:

1. Convention on Offenses and Certain Other Acts Committed on Board Aircraft, signed in Tokyo on 14 September 1963, is ratified by the Decree of Presidium of the Supreme Council of the USSR on 21 December 1987 N 5049-XI;
2. Convention for the Suppression of Unlawful Seizure of Aircraft, signed at the Hague on 16 December 1970 and came into force on 23 March 1972, is ratified by Presidium of the Supreme Council of the USSR on 27 December 1971;
3. Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, signed at Montreal on 23 September 1971 (is ratified by the Presidium of the Supreme Council of the USSR on 27 December 1972); with the Protocol on the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation, supplementary to the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation (1988);
4. Convention on the Prevention and Punishment of Crimes against Internationally Protected Persons, including Diplomatic Agents, adopted by the General Assembly of the United Nations on 14 December 1973. It is signed by de Ukraine in 1974 and ratified by the Presidium of the Supreme Council of the USSR on 26 December 1975;
5. International Convention against the Taking of Hostages, adopted by the General Assembly of the United Nations on 17 December 1979;
6. Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, signed at Montreal on 23 September 1971.
7. Protocol on the Suppression of Unlawful Acts of Violence at Airports Serving International Civil Aviation, supplementary to the Convention for the Suppression of Unlawful Acts against the Safety of Civil Aviation, signed at Montreal on 24 February 1988.
8. Convention for the Suppression of Unlawful Acts against the Safety of Maritime Navigation, done at Rome on 10 March 1988.
9. Protocol for the Suppression of Unlawful Acts against the Safety of Fixed Platforms Located on the Continental Shelf, done at Rome on 10 March 1988.
10. Convention on marking of Plastic Explosives for the Purpose of Detection, signed at Montreal on 1 March 1991.
11. International Convention for the Suppression of Terrorist Bombings, adopted by the General Assembly of the UN on 15 December 1997.
12. International Convention for the Suppression of the Financing of Terrorism, adopted by the General Assembly of the UN on 9 December 1999.
13. UN Convention on the Suppression of Transnational Crime (12 December, 2000, Palermo);
14. European Convention on the Suppression of Terrorism concluded in Strasbourg on 27 January 1977;
15. Program of realization of provisions of Warsaw Convention on Mutual Suppression of Terrorism (the Decree of the Cabinet of Ministers of 14 December, 2001, N 1694);
16. Treaty on Cooperation among the Ministries if Internal Affairs of the States Members of the Commonwealth of Independent States in Combating Terrorism (8 September, 2000);
17. Protocol on Confirmation of Procedure of Organization and Realization of Anti-terrorist Acts on the Territory of the States Members of the Commonwealth of Independent States (7 October 2002, Kyshyniv, ratified by the Law of Ukraine of 7 April 2004 N 1669-IV).

The number of measures are carried out on implementation of provisions of international legal

instruments, forming of national counter-terrorist legislation and organization of the integral state system of counteraction to terrorism.

The Law of Ukraine «On fight against terrorism» of March, 20, 2003 № 638-IV was passed. It is focused on the protection of person, state and society from terrorism, exposure and removal of reasons and terms which generate it. This Law also determines legal and organizational frameworks of fight against this dangerous phenomenon, and determines authority and duties of organs of executive power, associations of citizens and organizations, public servants and separate citizens in this sphere, as well as the order of co-ordination of their activity, guarantee of legal and social defense of citizens in connection with participation in the fight against terrorism.

In accordance with the Article 1 of the noted Law of Ukraine «terrorism is the publicly dangerous activity, which consists in conscious, purposeful use of violence by the taking of hostages, arsons, murders, tortures, intimidation of population and organs of power or accomplishing of other encroachments on life or health of in anything not guilty people or threats of accomplishing of criminal acts with the purpose of achievement of criminal purposes».

The articles 24 and 25 of the noted Law of Ukraine set up the order of acknowledgement of organization as a terrorist organization and envisage the responsibility for terrorist activity, and also responsibility for the assistance to terrorist activity.

The articles 258, 258-1(5) of the Criminal code of Ukraine envisages responsibility for act of terrorism and for creation, facilitation, sponsorship of terrorism, public urge to terrorist acts.

Experience of setting and development of contacts with international counter-terrorist organizations, law enforcement authorities and special services of other states on issues of organization and conducting of counter-terrorist measures is accumulated. One of important component of this activity is co-operation by participation in the organized and conducted by international and national counter-terrorist structures studies, trainings, scientific conferences and exchange by information within the framework of the specialized data bank. In accordance with Resolution of UN Security Council of September, 28, 2001 № 1373 the issues of comprehensive participation of Ukraine in the European and other international counter-terrorist structures are worked over, as well as development and deepening of collaboration with the proper authorities of foreign countries.

Jointly with Sate Security Service the projects of Agreement are developed between Cabinet of Ministers of Ukraine and Government of United States of America in relation to mutual acknowledgement and application of Lists of persons and organizations, that carry on terrorist activity or relate to it, as well as Agreement between Government of United States of America and Government of Ukraine in relation to collaboration for prevention of distribution of, its delivery systems and related materials by a sea-line.

Due to the decision of NATO about the granting to the countries-partners of access to the manual, which was renewed in 2006 in relation to the system of NATO on the reaction on crises (NATO Crisis Response System Manual), the measures on adaptation of the national system of reaction on crisis with the system of countries-members of Alliance are carried out.

In accordance with Law of Ukraine «On fight against terrorism» the interior bodies carry out the fight against terrorism by prevention, exposure and stopping of the crimes made with a terrorist purpose, investigation of which delivered by the legislation of Ukraine to their jurisdiction. In this connection basic directions of operative and service activity are directed on:

improvement of the system of safety and physical guard of basic objects vulnerable in the terrorist relation;

maintenance of public safety and law and order on such objects and round them, as well as in the places of mass stay of people;

fight against illegal migration and non-admission of penetration on territory of Ukraine of persons related to terrorist activity;

disclosure of grave and especially grave crimes, counteract to the illegal trafficking in weapon, explosive, radio-active substances and other facilities of terror.

Jointly with State Security Service (SSC) the tactical and special trainings within the

framework of preventive plans of the counter-terrorist operations «Boomerang», «Alarm» and «Whirlwind», general command and staff studies on separate diversionary vulnerable objects and tactical and special studies in accordance with the Anti-terrorist Center` plan at SSC have been conducted. The interior bodies of Ukraine have also taken part in the «Whirlwind anti-terrorist operations» and «Hireling», which have been conducted by law enforcement authorities of Russia.

The interior bodies carry out the intensified guard of 2,3 thousand of state establishments, objects of life-support and man-caused-dangerous objects (atomic electro stations, oil and complex etc.), 2,9 thousand of objects with firearms and live ammunitions, 14 thousand of places of mass stay of people. The protection of 122 diplomatic and consular establishments of the foreign states have been intensified.

The permanent monitoring of migratory processes with a purpose of reveal and neutralization of intentions of terrorist organizations in relation to transference of their activity on the territory of Ukraine is carried out.

During conducting of a purposeful operations and execution of everyday operatively-official tasks the interior bodies have detained a 14 thousand 785 illegal migrants, including 1 thousand 443 persons who moved as members of 126 groups.

Due to the corresponding measures of law enforcement authorities of Ukraine, worsening of criminal situation and move onto the territory of the states-participants of international terrorist and extremist organizations, committing by them illegal actions, including terrorist acts was prevented.

The unstable situation in the world related to the globalization of terrorism, requires the Ukraine to pay primary attention to subsequent development of current legislation, which would be able to incorporate to the international law and contain the prospect of improvement of law-enforcement activity with the purpose of creation of the effective system of measures of fight against the complex of so called «asymmetric threats», namely: international terrorism, transnational organized crime, illegal migration, illegal trafficking in weapons and drugs.

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A.U. Nashynets-Naumova, PhD in Law
(National Aviation University, Ukraine)

REFORMATION OF THE INFORMATIVE SYSTEM AIRLINES IS IMPORTANT DIRECTION OF ADMINISTRATIVE REFORM IN UKRAINE

In the article main priority directions are certain in relation to making of the international generally accepted standards, that would help to define the investment attractiveness of aviation enterprises, build the system them effective management and control.

Ukraine, undoubtedly, is one of the leading world air-space states. Generally known, that aviation industry is the major index of technical potential of country. Many leading world countries produce an excellent computer, domestic technique, cars, but cannot one by one produce an aerotechics, for this purpose it will be them to unite in corporations, consortia. Ukraine, in spite of economic difficulties, one by one capable to develop and produce competitive, in the world market, aerotechics, using potential accumulated in Soviet Union and modern works.

Will consider matter-position in aviation industry, and also will talk about the prospects of development of this industry in the future. Structural alteration of aviation industry of Ukraine enters into a decision phase. Swinging majority of enterprises was determined in part of forms and methods of restructuring. Now from that, as far as successfully the enterprises of industry will conduct restructuring, will depend it further development.

Aviation industry, as no other, has the opportunity to provide the increase of production of difficult hi-tech goods, leaning on own scientific and technical, productive and skilled potential. It was and in a great deal it will remain important national acquisition that supplies with high-tech in the civil sector of production. Structural alteration of industry envisages stage-by-stage implementation of the tasks, constrained on terms with present material and financial resources, requirements of national and branch economy, necessities of internal and external markets.

Presently the tasks of structural reformation are considerably more difficult of those that decided in previous years, as touch deep quality transformations of enterprises, including related to adaptation to the market conditions. Aviation industry can occupy a due by it place only on condition of capture the innovative way of development, bases of that must be stopped up in the process of structural alteration. Realization of politics, innovative model of structural alteration sent to introduction must become base principle of strategic course.

It should be noted that the market of passenger air traffics has most rapid among all types of transport of Ukraine rates of increase. Development of and regional, and international transportations during the last five years is conditioned by the increase of economy of country and volumes of transit traffic. Basic instruments of public policy of increase of passenger transportations are an input of the cross subsidizing of regional transportations. Ukraine can in future substantially increase the volumes of and passenger, and freight transportations an aviation transport. Firstly, the successful geographical location of Ukraine and presence of international airports, foremost international airport "Boryspil", give an opportunity to the country to attract a ponderable transit passenger stream. To Tom, without regard to small part of aviation transport in the structure of transportations all transport to the sector, transit aviation potential of Ukraine can be confronted with transit potential of pipeline transport of country. Secondly, old traditions of development of aviation industry and transport stipulate the presence of skilled personnel and educational and technical base. Select the state politics will determine the prospects of further market development as from between all types of transport an aviation transport has most specific gravity of international transportations and that is why functions in the system of intergovernmental agreements. Efficiency of foreign policy of Ukraine will play a key role realization business of plans of private participants of market also because the Ukrainian market until now is not liberalized and development of international routes between Ukraine and other world to is this day

regulated at intergovernmental level. Therefore a row of contradictory public statements of public servants of Ukraine is about a future public policy in relation to an aviation transport, and main is a method in that these statements are declared, stipulated the situation of vagueness in relation to future market development among his participants, and also potential investors.

It is not succeeded to carry out an integral and effective corporate management the state the enterprises of industry, it owns (state airports and most airlines of Ukraine are with state shareholding) that. In particular it entailed the origin of conflict round the variants of development of airport "Boryspil". Combination of functions of the economic adjusting and corporate management state enterprises in a civil aviation results in the origin of conflict of interests during realization of management or adjusting. Distribution of functions means the transmission of functions of management enterprises to the professional managers, meantime as executive bodies and regulator organs carry out only the independent technical and economic adjusting and provide terms for development of enterprises, without a right for interference with their economic activity.

Determination of strategy of development of aviation transport and concordance of functioning and development aviation and other types of transport. Creation of effective mechanisms of management of actions state packages is in the enterprises of civil aviation(including of state enterprises) for providing of national interests(expansion of markets of air services and providing of effective control of international markets from the side of companies of Ukraine, increase of economic efficiency of enterprises, increase of highly skilled working seating, increase of tax receivables capacity to the budgets and other). Establishments of only for industry standards, their harmonization with international standards, providing of effective control after safety of aviation(safety of flights, aviation safety, ecological safety), adjusting of market of aviation services for creation of equal terms for all participants of market and providing of national interests of Ukraine, and also creation of the system of reliable protection of consumers. Development of airports is broken by unfavorable tax politics. It envisages enumeration of substantial part of accuses state airports in the State budget, without regard to the high prime price of their activity, necessity of capital investments for providing of certification fitness and development. Leading airports are natural monopolies that predetermine the necessity of input of the economic adjusting of grant of airport services and establishment of collections for providing of balance of interests of users of services (passengers, airlines and other) and airports. The present system of change of size of airport collections upon request of airports and pulled-in in time (four-five months). It limits possibilities of effective financial management airports, as usually does not give an opportunity in good time to react on the changes of prime price of airport services or state of affairs at the market. Development of airports restrains absence of co-ordination of strategies of development of rout network of airlines that use services of airport, and airport. Co-ordination is not adjusted also between airports in maintenance within the limits of one system (for example, between airports there are "Boryspil").

Unlike international a basic problem of regional airports is their subzero work-load. It is related to the small volumes of internal air traffics, subzero financial and technical possibility of most regional air carriers and conditional supersaturating of regions by airports. Absence or small volumes of the state financing not only does not allow to develop the infrastructure of regional airports in accordance with modern standards but also to support accordance to the certification requirements.

On development of separate regional airports negatively the transferrableness of them influenced from a public domain in communal, as local government bodies do not have corresponding sources for their dating and clear strategy of development of these airports.

One of problems of development of civil aviation activity there is an incompleteness of creation, and in a number of cases is imperfection of our normatively-legal base that is reason of lacks of government control of activity of civil aviation.

The air code of Ukraine is accepted in 1993 actually was a maiden attempt to do the system of government control in aviation for new economic terms. Today it is already possible to say, that it answers international standards and universally recognized practice not to a full degree, but in some

moments and conflicts with them (especially in industry of adjusting of activity of aviation of general-purpose).

For an example it is possible to bring a situation over, that is in industry of adjusting of activity of aviation of general-purpose. It is new industry for public organs, because in Soviet Union of aviation of general-purpose it was not, and accordingly there were not rules of such activity. Today appears all anymore proprietors of air courts that want to use them for satisfaction of the personal necessities or necessities of enterprises and organizations, without the sale of services to the extraneous consumers.

Usually the rules of such exploitation of air courts of aviation of general-purpose must provide maximally possible will of activity to the proprietors. It belongs, first of all, to the order of admitting to exploitation of air courts, their state registration and to the order of the use of air space.

Completing the theme of air legislation, want to say, that in government control of activity of civil aviation there are objective and subjective reasons(for example frequent alterations of aviation power require the change of normative acts through disparity to new control system) such matter-position.

However, it is difficult to agree and with suggestions on "creation of the new Air legislation of Ukraine", that is sometimes pulled out on anything levels. It is impossible again to destroy everything, and then develop new rules.

It is a question already not once came into question in aviation public organizations. A way is certain one is perfection of the Air legislation by the successive bringing of "point" changes in corresponding normative acts, bringing of them to conformity to the international standards and practice. In opposite case it is possible to get another transitional period with chaos and lawlessness.

Conclusions

Thus, it is possible to come to the conclusion, that further researches of range of problems of corporate management on the whole, and corporate control in the airlines of Ukraine in particular, must be sent to development of suggestions in relation to perfection of current corporate legislation, namely: removal of situation, when a few normatively-legal acts regulate the same legal relationships, in particular, prescribe his general and special norms.

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I.P. Ustinova, candidate of juridical sciences
(National Aviation University, Ukraine)

THEORETICAL QUESTIONS OF FINANCIAL OFFENCE

This article deals with the analysis of theoretical background of the notion in the sphere of both financial and law responsibility and its structural element – the financial and law sanction. The author researches the real scientific ideas as to the notions "financial and law sanction", "fine". The author also analyses the functions of financial and law sanctions including as the basement of common law theory so as financial law in particular. His special task is to analyses the most characteristic determinants of financial and law sanction.

Question of financial offence deeply and scalene probed in legal financial literature during great while. The specific of concept foresees research of this question and by lawyers by theorists, and financiers, and civilest, and those, who is engaged in a criminal and administrative right. But a look exactly of financiers to this question is important theoretical payment in scientific developments of institute of offence.

In legal literature confessedly is approach after which offence is foundation of legal responsibility. Thus, for every type of legal responsibility main, system the concept of proper depict comes forward a formative element. From the review of right, offence is the display of tyranny, to neglect of those rules, which are approved and set the state for maintenance of social order and providing of rights, freedoms and legal interests of citizens [1, s. 138].

In modern scientific literature there is not the unique decision of concept «offence», by investigation what the different understanding of his essence is both in general theoretic and in of a particular branch, researches. Formulation scientifically – the grounded decision of «offence», him the legislative fixing and realization in law activity acquires today the special actuality in connection with the sharp increase of amount of offences and inability of law enforcement authorities always effectively on them to react [1, p.142]. Long time a concept «offence» was examined only as a legal fact. One of the first decisions of offence was given by S. G. Kotlyarevskiy and. L. Nazarov. On their opinion, offence is a legal fact which shows by itself the illegal act of delict person is guilty [2, s. 40]. A. A. Ivanov names offence of good behavior an antipode and determines him as publicly dangerous, illegal act of man, which harms personality, property, state or society, on the whole [3]. N. S. Malein examines offence as «conscious volitional act publicly dangerous illegal conduct» [4, s. 14]. As offence can be both publicly harmful (administrative offence), and publicly dangerous (crime), and a man can come forward the subject of offence not only, it is considered expedient to complement the above-mentioned decision, expounding him in the following kind: offence – it publicly a harmful or publicly dangerous act (action or inactivity), illegal act of relict subject (physical or legal person), which covets on interests of personality, state and society, on the whole, that guarded a law and which legal responsibility is set for [1, s. 145]. Defining a concept «offence» will pass to research of essence of financial offence. Necessity of selection of financial offence as independent foundation for application of measures of financial responsibility foremost, with the presence of the special legal industry – financial right. One of signs of independence of industry there always is a presence of own institute of compulsion. In the field of financial law such institute is presented in the complex of normative acts, regulative the order of realization of financial activity.

The legislation of Ukraine was contained by the concept of financial offence. It was formulated in p. of a 1.5.3 Instruction about the order of lead through of revisions and verifications by the organs of government control-revision service in Ukraine, ratified the order of Main control-revision administration of Ukraine from 03.10.1997 № 121: «financial offence is an action or inactivity of public, local self-government, subjects of ménage all patterns of ownership, associations of citizens, public servants, citizens of Ukraine and foreign citizens, investigation of

which was become by non-fulfillment financially legal norms, authorities». At the use of such approach of realization of financial offence established in the case of violation financially legal norms [5, S. 114]. With acceptance of the Budgetary code of Ukraine, a legislator formulated the concept of budgetary offence - failure to observe of budgetary process a participant set this code et all normatively legal by the acts of order of drafting, consideration, assertion, making alteration, implementation of budget or report, about implementation of budget (item 16). During the analysis of operating normatively legal find the bases of Ukraine next decisions of financial offence.

Financial offence is an action or inactivity on inspect objects investigation of which was become by non-fulfillment financially legal norms [6]. Financial offence is an action or inactivity of public, local self-government, subjects of ménage all patterns of ownership, associations of citizens, public servants, citizens of Ukraine and foreign citizens, investigation of which was become by non-fulfillment financially legal norms, authorities. Financial offence is an action or inactivity of government bodies, Ukrzaliznici, Derzhspectranssluzhbi, inspect establishments, them public servants investigation of which was become by non-fulfillment financially legal norms. As follows from maintenance of norms which are examined, they considerably differ from offered definition of financial offence and, in essence, are the decision of illegal conduct at industry of financial activity, but not financial offence, because does not set legal grounds for the offensive of financial responsibility for the subjects of offence. The in addition, resulted decisions fasten two forms of conduct of subjects (action or inactivity) though, but does not set the sign of guilt of act. Therefore a question of obligatory presence of guilt in composition financial offence already long time is the article of discussion among research workers in the field of financial law.

As the Russian scientist D Makarov, with forming of the field of financial law of concept «financial offence» in the system of classification of types of offences fully logical, but after the character it to this day quite often associates and equates with administrative misconduct [7, s. 120]. Professor E. Dodin on this occasion pays regard to that instability and ambiguousness of current legislation, which regulates financial activity, generates doubts in relation to legal grounds at the decision of question about the selection of offence financially legal character as independent [8, s. 14]. On the whole such remark is actual to Ukrainian realities. Consequently, until concept of financial offence as unique foundation financially legal it will not be legislatively fastened to responsibility, until then legislative grounds for attracting of person to this type of responsibility it is possible to consider absent.

Analyzing nature of general concept of offence, scientists, as a rule, select the followings signs of offence: offence always is an act (by an action or inactivity); always winy act; an act is publicly dangerous and illegal, that which conflicts with the norms of right; act for the finance of which legal responsibility is foreseen [9, s. 18]. As justly marks O. of E. Leyst, «any offence is a winy and illegal act, harmful or dangerous for public relations» [10, S. 62]. There fore financial offence as has a variety of the special legal fact all signs of illegal act and is violation of the special requirements of financial legislation, which form this industry. A public opinion, as a sign of act, consists in that an act which is determined a crime draws substantial harm public relations which are guarded a penal law, or creates the real threat of infliction of such harm [11, s. 8]. Publicly a dangerous act, as a sign of objective side of corpus delict, must be volitional, that by the display of will of person. Antisocial character is the financial sign of violations of financial legislation. Acts which violate the norms of financial right harm normal financial activity of the state and local self-government.

The next sign of offence is acknowledge illegal of act, that violation of norm of right. Not every act is offence, but only that which is accomplished despite legal orders, that breaks the law. It is or violation of prohibitions, or non-fulfillment of duties. Illegal of financial offence is expressed in broken the participants of financial relations of norms of financial legislation. Offence which contains signs financial is consider a that act which is foreseen a financial legislation only. It can be expressed in non-fulfillment of duties (inactivity) or fiancé of certain actions which do not answer (contradict, violate) normative orders.

The sign of guilt of offence accents attention on that legal responsibility can come only for

winy acts. Guilt as sign of offence specifies on existence of subjective connection between a illegal act and his consequences and person which accomplished such action or inactivity in form intention or carelessness [7, s. 115]. Most financial offences are accomplished in form direct intention, however much latent character of financial offences, and also imperfection of legislative registration of judicial, forms of bringing in to financial responsibility, does not allow law enforcement authorities to finish telling intention and correctly to characterize the actions of offender.

The last sign of offence is punish ability. Under «punish ability» understand the condition of application to the person which accomplished financial offence, negative legal consequences which are contained in financially legal approvals [12, s. 84]. Legal investigation of finance of act which contains the signs of financial offence is application of measures financially legal to responsibility. In the aggregate the transferred signs form the descriptive concept of offence. It fixes general external signs in offences of different kinds, deprives in the process of research from reiterations, sends attention to findings out main idea of this public phenomenon on the whole and opening of differences of him separate kinds. However much the analysis of current legislation which regulates public relations in the field of financial activity enables to draw conclusion, that the norms of current financial legislation do not determine all selected signs of financial offence.

A separate idea deserves attention In. Lisenko, which suggests to go near the problem of selection of financial offence, taking into account composition of offence, which is the aggregate of signs the presence of which grounds to consider a that or other act offence [13, s. 33].

At once becomes clear that this composition is not engulfed the types of offences generally accepted and described in a law. After the object of him it is impossible to attribute to civil, and after a subjective side and subject – to administrative offence. It is the special type of offence, the fiancé of which is foreseen by attracting to the special kind of responsibility with application of unique type of punishment, – financial approvals. For attracting to this kind of legal responsibility in the law of Ukraine or in a code, coming from the theory of right and more main all – from Constitution of Ukraine, there must be the described composition of the proper offence. If there is not composition (all necessary signs), there is offence. Theoretical research of legal nature of violations of financial legislation, and also the direct practical necessities of application of responsibility for their finance propose a requirement in relation to the legislative fixing of constitutional (objective and subjective) signs of these offences.

A model is that, without regard to the ambiguousness of the legislative fixing of concept of financial offence, research workers unanimously carry point in relation to independence of this legal category as foundation financially legal to responsibility. Professor P. Pustoroslev separately in the structure of offences selected financial. To financial offences a scientist in the field of law took above all things tax, in particular, non-payment of tax by a citizen the state after the offensive of term [1].

The row of domestic scientists selects financial offence in the structure of illegal acts. Will mark that majority, both domestic and Russian, scientists are probed financial offence within the framework or tax responsibility, or budgetary, whether in the field of currency legal relationships. Savchenko L. And., Cimbalyuk a.v., Shkarupa In. K., Became deaf in the train aid determine financial offence as violation well-regulated financially legal by the norm of order of mobilization, distributing and use of the centralized and decentralizing funds of money, for which a legislation is foresee legal responsibility [14]. Bud'ko, probing financially legal responsibility for the fiancé of tax offences, under tax offence a harmful, winy act (action or inactivity), which violates the norms of tax legislation for the finance of which it is foreseen financially legal responsibility, understands publicly [12].

Independence of financial offences is determined and in an administrative law also. Separate from them the sphere of administrative offences, not because of position of p. 22 st. 92 Constitutions of Ukraine, financial offences in a theory and practice are selected in the sphere of administrative delict. [15, S. 7]. In opinion of O. of Music, financial offence is a illegal act which trenches upon the order of realization of financial activity set the state and draws application of the

proper approvals, in particular and financial [16, S. 63].

For research of financial offence the advanced studies have an important value of. K. Voronova. It characterizes composition of offence which includes the followings elements in detail: object of offence; objective side of offence; subject of offence; subjective side of offence. To her mind, by the general object of financial offences well-regulated the norms of financial right public relations in the field of financial activity of the state, that in the process of forming, distributing and use of money, mean of budgets and state having a special purpose funds. These relations are in public legal, well-regulated imperative financially legal by norms.

Consequently, we have a sufficient scientific ground of necessity of existence of such legal category as financial offence, and the legislative selection of financial offence in an independent kind will have an important value for confirmation of independence of all institutes financially legal to responsibility.

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S.G. Golovko, candidate of historical sciences,
V.V. Sobkova
(National Aviation University, Ukraine)

PROMINENT RESEARCHERS OF SPACE ERA

The formation and development of cosmonautics in works and scientific projects of prominent researchers of theory and of mastering of circumterrestrial space is lighted in the article. A contribution of native and foreign scientists in the branch of missile technology and their influence on forming of modern space technologies is analyzed here.

One of the greatest achievements of scientific and technological progress in the last century was the creation of automated and manned rocket and space systems, which successful launches enabled man to overcome Earth's gravity, to get into open space and to set foot on the Moon. The achievements of science and technology which are underlying of these bold projects, advanced the time when, the founder of Astronautics, an outstanding Russian scientist Konstantyn Tsiolkovsky predicted, "... mankind will go beyond the bounds of their planet and begin to develop close and distant objects of outer space ...".

This year is rich on prominent dates in history of cosmonautics. In January, 105 years since the birth of Sergei Korolev - academician, chief designer of the first rockets-vehicle and manned ships is celebrated. In June, the scientific community celebrated 115 years since the birth of Yuri Kondratyuk (Alexander Sharheya), native engineer, researcher, pioneer of astronautics. His «star route» opened a way to the realization of one of the boldest ideas of humanity, which was embodied by American astronauts - Flight to the Moon. 125 years ago was born a talented designer Frederick Tsander who worked on the first jet reactive engines. 55 years ago, in October, 1957, the first artificial satellite (FAS) was placed in a circumterrestrial orbit, the start of which put the beginning of practical researching of space.

The way of humanity from fantastic descriptions of space trips to the real embodiment of bold ideas was protracted and difficult. Although the detailed and systematic research of space began comparatively recently (for the point of counting out may be chosen the start of first FAS), however history of studying space, beginning from the first observations of star sky by an old man lasts for many millenniums.

For the development of space particularly important and crucial moment was when, after lengthy discussions about the possible ways of practical embodiment of idea of interplanetary connecting, scientists and designers came to the idea, that to overcome the force of gravity is possible only on rocket engine which will work on reactive basis. Therefore, the development of astronautics and rocketry can outline the following steps: researches of Jet Propulsion by ancient scientists; the usage of powder rockets in military affairs; projects of first aircraft for space flights; theoretical substantiation of usage of resources of Jet Propulsion; experiments with the first jet rocket engines; the first controlled rocket-propelled ballistic missiles; launch of the first artificial Earth satellite and the beginning of systematic researching of space by automated spaceships; flights of manned space vehicles and systems.

On each of these stages successes were achieved due to hard work of researchers and designers from different countries.

One of the first mentions about reactive devices is dated by the IV item B.C. Greek Arkhitas Tirentskiy described a wooden bird which was planned to move using a steam reactive stream which followed from him. Jet engine in the book "Pneumatics" was considered by Heron of Alexandria. First gunpowder reactive rockets (and more precisely, gunpowder primers) were known in Old China. The Chinese warriors applied darts, charged with gunpowder, which flew and burst, and also gunpowder rockets for fireworks. In Middle Ages such devices were met in the countries of Asia, Africa and Europe.

Mentions about similar devices with “unknown mixture” were found in the times of Kiev Rus. About in 1250 Mark Greek described the missiles of different countries in the "Book of Fire". In 1379 the Italian Murtori first used the word "rocket". Zaporozhian Cossacks at the beginning of the XVI century used "rourke" which flew and hit the target, bursted. By such arrows, stuffed with the gunpowder of own production, they defended their fortifications.

From the end of the XVII century in Europe and Russia various rockets were widely used for fireworks, for the guiding of which the special establishments were created. It is known that the students of the Kiev Mohyla academy started fireworks.

Lieutenant-General of the Russian army artillery Konstantin Konstantinov in 1847 designed a missile ballistic pendulum, at which examined the dependence of change of moving forces of rocket on time, and the influence of shape and design of rockets on its ballistic properties. The inventor has created a missile flight range of up to 5 km. From 1867 year he managed the Mykolaiv rocket factory.

Among the designers of artillery rockets we should remember our countryman, Lieutenant-General Alexander Zasyadko, who was born in the village Lyutenka Hadiach County of Poltava province, served in the army of Alexander Suvorov. O. Zasyadko constructed missiles of three calibers: 4 -, 2 - and 2.5 - inch, which in range of flight did not yield to European.

In 1881 the project of aircraft for motion of which there was not necessary in atmosphere was offered by Mykola Kibal'chich, which was born in a town Korop of the Chernigiv region. In 1881 M. Kybalchych was imprisoned as a member of the attempted assassination of Alexander III. M. Kybalchych was accused of making four casting shells for an attempt on March 1. On the walls of the cell researcher whom the prosecutor called "the great specialists and talented inventor," painted a design of an aircraft. Marking the contribution of scientist in the rocketing, a crater on the Moon was called by his name.

For practical realization of numerous projects of reactive aircrafts, which appeared in the second half of the XX century, it was necessary to perform the detailed calculations of both devices and the conditions and parameters of their motion. One of the first scientists, who probed the theoretical aspects of this question there was Isaac Newton, which in his work “World Systems” described the leading out a body from a surface to the orbit of satellite of Earth by using giving it the necessary speed.

The end of XIX – beginning of XX century was characterized by new tendencies in development studies about reactive movement. The special place in the development of cosmonautics belongs to the prominent Russian scientist Kostyantynu Tsiolkovskomu, who executed the detailed theoretical researches and one of the first considered the possibility of their use for practical realization of interplanetary flights. In 1903 the scientist published his classical work "The researching of world spaces with reactive devices". Konstantyn Tsiolkovsky proposed to use multi-stage rockets and circumterrestrial space stations and also expounded the prospects of development of humanity and trips in boundless spaces. Works of K.Tsiolkovskogo made a considerable influence on development of cosmonautics in the whole world.

Upon the first theoreticians-pioneers of cosmonautics an important place takes Yuri Kondratyuk (Oleksandr Shargey), talented engineer and explorer. Oleksandr Shargey was born in Poltava where being a high school student started to work over manuscript “For those who will read in order to build”. He expounded ideas about reactive movement and the use of reactive devices for the space flights. The researcher examines in detail the design of a rocket. Now the suggestion of the researcher to use sun energy to get a rocket fuel (unhitching of the water to components) is still relevant.

In 1929 scientist at his own expense published the work "The conquest of interplanetary spaces", which summarized his researches. When World War II began, Yuri Kondratyuk went as a volunteer on front. A prominent researcher perished in February, 1942 on Kryvtsivskiy springboard. By the name of famous compatriot was named a crater on-the-surface of the Moon and one of minor planets of the Solar system. Yuri Kondratyuk regardless of Konstantyn Tsiolkovsky by other methods showed out basic equation of motion of rocket. A scientist probed the structure of ramjet,

types of fuel for a ramjet, usage gyroscopes for the orientation of space vehicle, extraterrestrial stations and their services, advanced idea of flight to the bodies of Solar system by the special chart, which later will be named the "star route of Kondratyuk". Just after it was carried out the program "APOLLON", which was developed by the American scientists, and which was completed with going out of man on the surface of the Moon.

In one period the time of Kondratyuk our countryman, Georgy Langemak worked as Pioneer of rocket production. He was born in city Starobilsk of the Kharkiv province. In 1934-1937 G.E.Langemak was a deputy chief and main engineer of the Reactive scientifically-research institute. Together with Boris Petropavlovskij Heorhij Langemak was the main designer of jet-projectiles on a hard fuel, which became basis of creation of shells for the known guards mortars in the years of Great Patriotic war – "Katyush". G. Lanhemak is the author of several publications.

One of the first researchers of Jet Propulsion, who tried to convert the problems of interplanetary flights in the plane of their practical implementation, was Frederick Tsander who in his school days checked the calculations of K.Tsiolkovskij and persuaded in the possibility of space flights. From 1917 the inventor worked on the questions of flights to other planets, constructing ramjets and rocket equipment, conducted the mathematical calculations of expedition on Mars, probed the systems of life-support.

Fridrih Cander specified on the necessity of researching of difficult, inserted one in other (multi-stage) rockets, and also combination of rocket with airplane (equipment of the interplanetary ship during a start with wings for a flight in an atmosphere and lowering on Earth), usage as the fuel worked out parts of spaceship. In 1931 year began the collaboration of F.Cander with S.Korolev, when was created GRJP (group of research of jet propulsion). The first members of the group were Tsander, Korolev, Vetchynkin, Pobedonostsev, Tyhonravov, Fedorenkov, Chernovskyi, Sumarokov, Zabotin, Levitsky. Fridrih Tsander headed the group.

The co-ordinator of large group of researchers of jet propulsion and designers of rockets was a prominent scientist and organizer Serhij Korolev, who was born in the city Zhytomyr, studied at the Kiev polytechnic institute. In 1923 S.Korolev constructed his first glider which was found suitable for a construction by the aviation-technical department. In 1932 S.Korolev became the leader of Group of research of jet propulsion. In 1946 he became the main designer of ballistic rockets of distant action and in 1947 he became the member-correspondent of Academy of artillery sciences. In 1954 S.Korolev made a proposition relatively to creation and start of an artificial Earth satellite, which was realized in 3 years, in October 1957. The first satellite was designed as a sphere of mass 83.6 kg and a diameter of 580 mm and had four antennas with length 2,4-2,9 m. The first satellite lasted 92 days and made about 1400 turns around the Earth. In 1958, the scientist was elected to be the Academician of the Academy of Sciences of the USSR, and since 1959 he was working on an automatic station “Luna-1”. Huge success and the result of many years of hard work of the team, led by scientist, became the launch of the first space shuttle with the first astronaut Yuri Gagarin aboard in 1961.

Last November was celebrated the 100th anniversary of the birth of Michael Yangel known scientist and designer in the field of astronautics. Yangel surname comes from the “young” - ladle, iron scoop where Cossacks cooked a meal. Yangel’s family (grandfather) lived in Chernihivschyna and then moved to eastern Siberia. Here in the village Zyryanov Michael Yangel was born. In 1931 he entered the Moscow aviation institute. In 1938 M.K. Yangel went to the USA at personnel representation for acquaintance with the best aviation examples. After studying at the Academy began the collaboration of M.K. Yangelya and S.P. Koroleva. In 1954 M. Yangel went in business trip, which was lasted for 17 years. He was appointed chief designer of one of the leading design bureau (DB) - Mikhail Kuzmich comes to Ukraine, on Pivdenmash. Scientific potential, organizational capabilities, allowed M.K. Yangelyu to convert DB headed by him into the cradle of bold ideas which was incarnated in practice. Under the direction of M. Yangelya the new space-rocket systems were developed. From 1954 to 1971 M.Yangel worked as the main designer of DB “Pivdenne” which carries his name today. In DB “Pivdenne” and production association “Pivdenmash” the strategic rockets of military-oriented of “R-12, - 14, - 16” were developed. From

1962 there work on a long term program “Space” started.

Jet engines are the most important components of rocket and space systems. Over their development and improvement many designers were working. Among them, Valentin Glushko, who was born in Odessa. Being a schoolboy, he studied works of K.Ciolkovskogo and corresponded with a prominent scientist. Together with the employees V.Glushko was engaged in the selection of effective components of rocket fuel. In 1974 on the base of experimental designer bureaus of V.Mishina, successor of S.Koroleva and V.Glushka, other scientific and production organizations, research and production association “Energy” was established. Valentine Glushko became a leader and general designer. Research assistants of “Energy” carried out projects “Soyuz” – “Apollon”, it was placed on the orbit the station “Salute” of the second generation, pilot-controlled ship “Soyuz – TM”, pilotless “Progress”. The biggest achievement was a creation of rocket-transmitter “Energy” and ship of multiple-use “Buran”. The birth of this new rocket-space system is associated with the name of its chief designer V.Hlushko. The main designers of rocket and engines were Sergij Korolev and Valentine Glushko. The collaboration of prominent scientists lasted many years.

A reasonable part in development of the space system engineering played Volodymyr Chelomej, who was born in a teacher-family, graduated from the Kyiv Institute of Aviation postgraduate course of the Academy of Sciences (1939). And already in 1940 25-years-old scientist entered to special doctorate in personnel of the 50 best candidates of sciences from all republics. From 1941 Volodymyr Chelomej worked in the Central institute of aviation motor construction. In 1945 a rocket “10 X” was tested which was started from the airplane of “Pe-8”. On this wing-rocket was tested the first pulsating ramjet constructed by V.Chelomej. During 1945-1954 under the direction of V.Chelomej a few types of wing-rockets were created. His idea of opening of wings in the air has been widely used in a rocket technique. In 1959 the scientist was appointed a chief designer. In his DB was created a rocket-carrier “Proton” and research stations “Proton”.

Except of separate talented researchers, payment of Ukraine to the matter of mastering of space is determined by the concrete projects of designer bureau “South” which was created in Dnipropetrovsk in 1954 as one of main enterprises of the USSR in production of strategic battle rockets, and afterwards space systems. M.Yangel was the first general designer of DB “Pivdenne”. During more than forty-year activity in DB “Pivdenne” were created 26 space vehicles “Space” and “Interkosmos” for researching Galaxy; a 21 space vehicle is for researching Sun; more than 50 space vehicles for researching planet Earth and circumterrestrial space; 11 space vehicles which were pertaining to national economy.

The national contribution to the space mastering is not limited with important achievements of theorists and designers. Many representatives of numerous detachments of cosmonauts are our countrymen (see a table 1).

Table 1

The Ukrainian researchers are in detachment of astronauts

Name astronaut	Place of birth	Name of spaceship	Year of flight
Popovych P.	v.Uzyn Kyivskiy region	“Vostok-4” “Soyuz-14”-“Salyut-3”	1962 1974
Beregovyj G.	v. Fedorivka Poltavskiy region	“Soyuz-3”	1968
Shonin G.	c.Rovenki Luganskiy region	“Soyuz-6”	1969
Dobrovolskyj G.	c. Odesa	“Soyuz-11”-“Saluyt”	1971
Zholobov B.	v. Zburivka Khersonskiy region	“Soyuz-21”-“Saluyt-5”	1976
Lyakhov V.	c. Antratsyt Luganskiy region	“Soyuz-32”-“Saluyt-6” “Soyuz T-9”-“Saluyt-7” “Soyuz TM-6”	1979 1983 1988

Popov L.	c. Oleksandriya Kirovogradskiy region	“Soyuz-35”-“Saluyt-6” “Soyuz-40”-“Saluyt-6”	1980 1981
Kyzym L.	c. Krasnyj Lyman Donetsky region	“Soyuz T-3”-“Saluyt-6” “Soyuz T-10” “Soyuz T-15”	1980 1984 1986
Volkov O.	c.Gorlivka Donetskiy region	“Soyuz T-14”-“Saluyt-7” “Soyuz TM-7”-“MIR” “Soyuz TM-13”-“MIR”	1985 1988-89 1991-92
Artsebarskiy A.	v. Prosyana Dnipropetrovskiy region	“Soyuz TM-12”	1991
Malenchenko Y.	v. Pavlivka Kirivigradskiy region	“Soyuz TM-19”	1994
Kadenyuk L.	v. Klishkivtsi Chernivetskiy region	“Kolumbia”	1997

Among the most essential flights with participation of native astronauts it is possible to mark a flight with Leonid Kadenyuk in composition of a crew “Colombia”, who together with the American and Japanese astronauts during 16 days was on an orbit, conducting experiments.

After a historical overview of the history of space exploration, we can conclude that the development of this branch of science and technology required and will require association of considerable efforts of a large cohort of scientists and engineers from different countries, among which an important role always played Ukrainian researchers. And our state has powerful scientific and technological potential, which is necessary for further effective research and mastering of space, and occupies an important place in the association of space countries of the world.

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O.M. Myronets, I.A. Slobodska
(National Aviation University, Ukraine)

SALE OF MOON AND FUNCTIONS OF LAW

In the article the authors have considered the legal aspects of sale of the Moon and other celestial bodies and purchasing of these objects by natural persons in modern Ukraine. The legal side of this question was discovered. The legal consequences of this type of legal relations were analysed and described. It was discovered the importance to carry out general social functions of law in the sphere of the investigated problem by the state to defence the rights and legal interests of the citizens of Ukraine.

It is very popular to buy piece of land of the Moon or other celestial bodies by Ukrainians and foreigners nowadays. Advertisement and discussions in mass media intensify the interest to this question. The proposition to be the owner of land on the Moon, Mars or Venus is very interesting, but there is a question about legality of this. It is obligatory to consider and analyse the international legal documents, which regulate the space relations, to decide investigated question.

According to the article II of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, which was adopted by the General Assembly of the United Nation Organization in 1967, outer space, including the moon and other celestial bodies, is not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means [1]. There is the same norm in the Declaration of Legal Principles Governing the Activities of States in the Exploration and Use of Outer Space, which was adopted unanimously by the United Nations General Assembly on 13 December 1963. According to the article 3 of this document outer space and celestial bodies are not subject to national appropriation by claim of sovereignty, by means of use or occupation, or by any other means [2].

There is a legal act, which regulates the activities of the states on the Moon and other celestial bodies. This is Agreement Governing the Activities of States on the Moon and Other Celestial Bodies. The Moon Agreement was considered by the Legal Subcommittee from 1972 to 1979. The Agreement was adopted by the General Assembly on 5 December 1979. According to the part 2 of the article 11 of the Moon Agreement the moon is not subject to national appropriation by any claim of sovereignty, by means of use or occupation, or by any other means. According to the part 2 of the same article neither the surface nor the subsurface of the moon, nor any part thereof or natural resources in place, shall become property of any State, international intergovernmental or non- governmental organization, national organization or non-governmental entity or of any natural person. The placement of personnel, space vehicles, equipment, facilities, stations and installations on or below the surface of the moon, including structures connected with its surface or subsurface, shall not create a right of ownership over the surface or the subsurface of the moon or any areas thereof. [3].

On the base of the information it is possible to make a conclusion, that sale of the Moon and other celestial bodies is illegal, because it contradicts to the norms of international space law. But there is a question why organizations, which sale piece of land of the Moon and other celestial bodies, continue their activity legally and why the famous and educated people buy such type of goods? The conflict of international law (collision) relatively the acquisition of right to property on parts of celestial bodies is the reason of this process.

The Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies, which sets, that any celestial body is not subject to national appropriation, does not deprive of this right legal and natural persons. The United Nation Organization tried to shut this problem and proposed the Moon Agreement. This agreement was opened for signing on 18 of December 1979 and entered into force on 11 of July 1984 [4, p. 73]. But during the voting only 6 states-members of UNO from 185 ratified this

document. Nowadays the most part of the states do not want to ratify the Moon Agreement.

According to the article 11 of the Vienna Convention on the Law of Treaties, which was done at Vienna on 23 May 1969 and entered into force on 27 January 1980, the consent of a State to be bound by a treaty may be expressed by signature, exchange of instruments constituting a treaty, ratification, acceptance, approval or accession, or by any other means if so agreed [5]. According to the part 2 of the article 19 of the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies, this Agreement shall be subject to ratification by signatory States.

Nowadays there is the collision in international space law about the problem of sale of the Moon and other celestial bodies. Dennis Hope, the citizen of the United States of America have used this conflict in space law. In 1980 he handed the application to the state department in California and got the document, which is certify his ownership on the all planets of the Solar System and 53 objects, except Earth and Sun. According to the laws in California, if thing has no owner, if there is no other candidate, this thing can become the property of one, who asks about it the first. Mister Hope used this right, after this he told the USA, China, USSA, UNO, waited 3 years term and began the process of sale. The Luna Embassy Commission works since 1980. During this time more than two millions pieces of land of the Moon and more than ten thousand on Mars and Venus were sold. The main company is located in Nevada in the USA. There is the official website of the company (www.lunarembassy.com). The local offices are opened in many different states. For example: Austria, Byelorussia, Denmark, Estonia, Canada, Latvia, Lithuania, Germany, New Zealand, Norway, Russia, Rumania, Hungary, Finland, France, Czech Republic, Sweden, Japan and other. In Ukraine the Lunar embassy department works in Kiev since 2000.

If the person wants to buy the part of the Moon or other celestial bodies, this person must ask any department of the Lunar Embassy, tell his or her name, surname, date and place of birth and place of residence. The person will get the following documents: Certificate about ownership on the Moon, The Lunar Constitution and Bill of Rights and the map of the visible side oh the Moon. The term of preparation of the documents is one day. Delivery on the territory of Ukraine is free. The new owner is registered in the register of celestial bodies owners and after this she or he get the identification code. The dimensions of parcel of land is one acre. It is possible to create the Moon republic and maybe all buyers will get moon citizenship and get Passport of the space investigator. The buyer may chose the location of the part of the Moon or other planets of the Solar System, but in the limits of the territory, which is sold in the moment of the contract. But it is impossible to buy parcel of land of the Moon, which is the territory of the landing of the soviet and american spaceships. Mister Hope wants to create the national park on these territories, which will be free for everybody. There is very interesting proposition on the website of the Lunar embassy to buy the parts of the Moon and other celestial bodies with aim to make a special present or become the neighbour of the famous people, invest money or become the owner of mineral wealth. It is also the effective PR-instrument.

But really all financial operations with celestial bodies are illegal. That is why sale of the Moon and other planets of the Solar System is only the way to get money of the people, who do not know about legal side of sale and purchase of celestial bodies. Mister Hope sells beautiful papers with the location of the parts of the Moon and other planets of the Solar System [6]. “If you are going to buy land on the Moon, you have got to understand that this is for entertainment purposes only. The company selling the land does not have the rights to it, and no other organization on Earth will respect the property right claim” [7].

The ratification of the Moon Agreement is time question. There will be the real question about the actions of the people, who have bought the space property, and their money. It is improbably, that Mister Hope will pay back money. It is obligatory to stop the process of sale of Moon and other celestial bodies. But the states do not want to do it fast. Maybe there is financial interest in this. Mister Hope gives much money to the space investigations. For example, he with government of the USA have sent up the launch to investigate the Moon [8].

According to the part 1 of the article I of the Treaty on Principles Governing the Activities of States in the Exploration and Use of Outer Space, including the Moon and Other Celestial Bodies,

the Moon and all celestial bodies are the acquisition of all mankind. According to the part 2 of the article I of this Treaty outer space, including the moon and other celestial bodies, shall be free for exploration and use by all States without discrimination of any kind, on a basis of equality and in accordance with international law, and there shall be free access to all areas of celestial bodies [1]. That is why it is necessary to explain the collision in the norms of international space law in the field of sale of the Moon and other celestial bodies, which is provided nowadays.

There is sale of the Moon and other planets of the Solar System in Ukraine more than 11 years. But the state does not want to do actions to stop this process. It is possible to regulate this question with the help of law, which is the regulator of social relations in Ukraine. Law influences to the society through the help of functions of law. There are two group of functions of law. They are: general social and special legal functions. Informative (communicative), orientation, educational, evaluational, gnosiological (cognitive), humanistic and other are general social functions of law. Special legal functions are regulative and protective functions. Informative (communicative), orientation, educational functions play very important role in society. The informative function of law informs the people about the will of the legislator and about their rights, freedoms and duties. The role of the educational functions of law is priceless, because this function influences on consciousness, conduct of the people and forming of the person in society. The level of legal culture and legal consciousness in Ukraine, decrease of quantity of offences, esteem to the rights and duties of the members of society, law and state depends on the effectiveness of educational function of law in our state. The orientation function of law describes the reasons of orientations of the legal conduct for all subjects of legal relations in Ukraine.

The state must pay attention to the problem of sale of the Moon and other celestial bodies in Ukraine and take all due measures to stop this process, because it have to defence all citizens of Ukraine. The state must carry out the functions of law, especially informative, educational and orientation. For example, it is necessary to inform Ukrainians about illegality of financial operations with celestial bodies with help of television, newspapers, magazines etc. It is obligatory to pay attention to the legal side of this question to all citizens understand, that to buy celestial bodies is mistake and a right of ownership on the Moon and other planets of the Solar System is illusion. It is necessary to repeat these methods time to time. The state must ratify the Agreement Governing the Activities of States on the Moon and Other Celestial Bodies very fast with the aim to defence rights and legal interests of the citizens of Ukraine. It is necessary to stop the activity of the Lunar embassy in Ukraine by legal methods after the ratification of the Moon Agreement. It is obligatory to shut the department of this company in Ukraine and stop sale of celestial bodies, because this type of business is offence. It is unreal to punish for this offence in Ukraine, because there is the collision in international space law. But the state can and must defence the citizens of Ukraine and take all due measures for this. This step is necessary, because the citizens can esteem only the state, the law and the state power, which can really defence them.

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V.O. Zuieva, candidate of political sciences,
V.B. Cherevatuk, candidate of historical sciences
(National Aviation University, Ukraine)

CERTAIN ASPECTS OF LEGAL RELATIONS IN INTERNATIONAL CARRIAGE BY AIR IN UKRAINE

The article deals with certain aspects of legal relations in international carriage by air in Ukraine and provides a description of the framework of legal regulation of international carriage by air handled by Ukrainian airlines.

The relevance of this study is driven by two key factors. In the first place, the issue of Ukraine's integration with European and global economy and prospects of its development as a transit country increase the needs of efficient legal regulation of Ukrainian airlines' activities at the international level. In the second place, a crucial challenge is to bring the Ukrainian legislation that regulates legal relations in international carriage by air in Ukraine in line with global standards.

This range of problems has been covered in studies of such scientists and experts from Ukraine and abroad as M. Boguslavsky, V. Bordunov, V. Butylin, B. Yeliseyev, V. Cubinsky, V. Kulik, S. Pereverzeva, M. Puchkova, P. Rabinovich, O. Stremoukhov, G. Shmeliova, V. Shchelkunov, L. Yashchenko and others.

It is notable that in recent years the market of air passenger carrying operations has been rather fast-paced (except 2009). Gradually over 11 years air passenger traffic of Ukrainian airlines has grown almost six-fold (compared to 2000). Material factors that contribute to better performance of local airlines are further route network expansion and increasing flight intensity to the destinations already developed together with upgrading the aircraft fleet at the same time. Apart from that a considerable emphasis is currently placed on activities aimed at promoting flight safety and improving the quality of service. A significant contribution to increasing the traffic volume is made by putting new airport facilities into operation on the threshold of EURO-2012 as well as rehabilitation of the existing facilities, which are fitted with advanced equipment, innovative technologies and systems [1].

The aforementioned gives reasons to believe that transportation operations involving state-of-the-art aircraft both internationally and in Ukraine are of large-scale, regular and rather complicated character. That calls for explicit legal regulation of carriage by air, establishing rights and obligations of those involved in the transportation process, specifying transportation safety liability and security of all parties involved in carriage by air.

Nowadays transportation operations involving aircraft of Ukrainian airlines are regulated by the national legislation and international treaties. However recently there has been a trend to change legal regulation of international carriage by air and to make the legal regulation of liability of those involved in this process stricter.

Legal regulation of transportation relations is recognized as crucial at the current development stage of our country, and at this very moment there is an issue of changing the current legislation and of adopting a new law to regulate the process of handling carriage by air including the international one. Thus, the Concept of Adaptation of the Ukrainian legislation to the EU laws approved by the Resolution №1496 of the Cabinet of Ministers dated August 16, 1999, recognizes the carriage legislation as one of the top-priority areas to be adapted to the EU legislation [2].

Legal relations in international carriage by air in Ukraine are regulated by the applicable Ukrainian legislation and a number of international treaties. The guidelines of the Air Code of Ukraine, the Civil Code of Ukraine, the Economic Code of Ukraine and provisions of international legal treaties, in particular the Montreal Convention of 1999 that came into effect for Ukraine on May 6, 2009 on the base of the Law of Ukraine "On Ukraine's accession to Convention for the Unification of Certain Rules for International Carriage by Air" dated December 17, 2008

(hereinafter referred to as the Montreal Convention) are closely intertwined [3]. The latter became the summary of new economic and social standards applied to the carrier's liability and brought up to date the obsolete guidelines of carriage by air contained in the Warsaw Convention of 1929.

It should be noted that the Warsaw system that was in effect before has in recent decades become virtually inoperative. Out of eight instruments only two are still in force [5]. Thus, adoption of the Montreal Convention was aimed at two main things: codification of rules of international carriage by air in one document (taking into account the most up-to-date guidelines of the Warsaw system) and modernization of liability mode of an air carrier (primarily with regard to passenger carriages). First and foremost it should be mentioned that the Convention refers to the so-called international carriage by air. According to Paragraph 2 of Article 1 of the Convention the expression international carriage means any carriage in which, according to the agreement between the parties, the place of departure and the place of destination, whether or not there be a break in the carriage or a transhipment, are situated either within the territories of two States Parties, or within the territory of a single State Party if there is an agreed stopping place within the territory of another State, even if that State is not a State Party. Carriage between two points within the territory of a single State Party without an agreed stopping place within the territory of another State is not international carriage for the purposes of this Convention [4].

Secondly, the Convention invalidated the procedures and considerably increased the carrier's liability limits.

It is by no means unimportant that one of the main peculiarities of the Montreal Convention is the absence of carrier's liability limits (compared to the Warsaw Convention that established the limit of liability for causing death or severe bodily injury to passengers) [3]. Thus, the carrier's liability for the damages in the amount exceeding 100 000 Special Drawing Rights (SDR), which cost rate is calculated every day, is not limited. According to Paragraph 2 of Article 21 of the Convention the carrier shall not be liable for such damages, if the carrier proves that such damage was not due to the negligence or other wrongful act or omission of the carrier (at the same time for the proven damage not exceeding 100 000 SDR for each passenger, the carrier shall be liable regardless of the carrier's guilt.

If the carrier proves that the damage was caused or contributed to by the negligence or other wrongful act or omission of the person claiming compensation, or the person from whom he or she derives his or her rights, the carrier shall be wholly or partly exonerated from its liability to the claimant to the extent that such negligence or wrongful act or omission caused or contributed to the damage. When by reason of death or injury of passenger compensation is claimed by a person other than the passenger, the carrier shall likewise be wholly or partly exonerated from its liability to the extent that it proves that the damage was caused or contributed to by the negligence or other wrongful act or omission of that passenger. This Article applies to all the liability provisions in this Convention, including paragraph 1 of Article 21 [3]. As per Article 22 in the case of damage caused by delay as specified in Article 19 in the carriage of persons, the liability of the carrier for each passenger is limited to 4 150 Special Drawing Rights [3]. In the carriage of baggage, the liability of the carrier in the case of destruction, loss, damage or delay is limited to 1 000 Special Drawing Rights for each passenger unless the passenger has made, at the time when the checked baggage was handed over to the carrier, a special declaration of interest in delivery at destination and has paid a supplementary sum if the case so requires. In that case the carrier will be liable to pay a sum not exceeding the declared sum, unless it proves that the sum is greater than the passenger's actual interest in delivery at destination [3].

In the carriage of cargo, the liability of the carrier in the case of destruction, loss, damage or delay is limited to a sum of 17 Special Drawing Rights per kilogram, unless the consignor has made, at the time when the package was handed over to the carrier, a special declaration of interest in delivery at destination and has paid a supplementary sum if the case so requires. In that case the carrier will be liable to pay a sum not exceeding the declared sum, unless it proves that the sum is greater than the consignor's actual interest in delivery at destination [3].

In the case of destruction, loss, damage or delay of part of the cargo, or of any object

contained therein, the weight to be taken into consideration in determining the amount to which the carrier's liability is limited shall be only the total weight of the package or packages concerned. Nevertheless, when the destruction, loss, damage or delay of a part of the cargo, or of an object contained therein, affects the value of other packages covered by the same air waybill, or the same receipt or, if they were not issued, by the same record preserved by the other means referred to in paragraph 2 of Article 4, the total weight of such package or packages shall also be taken into consideration in determining the limit of liability [3]. According to air law professionals, Ukraine's joining the Montreal Convention will make it possible to bring the regulations of Ukrainian law in line with international standards regulating the carrier's liability, as well as contribute to flight safety through enhancing carriers' liability [6]. This approach, in its turn, will promote increased attraction of the national carriers' services in international traffic and gaining extra competitive benefits by the Ukrainian carriers in the course of handling carriage by air compared to the carriers of the State Parties of the Warsaw Convention [6, p. 142].

It's indisputable that currently the adoption of the draft Law of Ukraine "On peculiarities of state regulation of the air carriers' activities related to carriage of passengers and cargos by air" (hereinafter referred to the draft Law) [8] should be considered a positive trend in development of the national legislation. The main target of adoption of the draft Law is the necessity to bring the legislative instruments in line with the Air Code of Ukraine and laws of the European Union [8].

In summary it should be noted that legal regulation of international carriage by air handled by Ukrainian airlines calls for refinement based on a detailed scrutinizing of the guidelines of the ratified Montreal Convention. Besides, a special focus should be given to implementation of advanced EU practices, in particular, those referring to establishment of the appropriate institutions for protection of passengers' violated rights, authorized not only to settle disputes, but to monitor airlines' activities as well.

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I.M. Sopilko, candidate of juridical sciences
(National Aviation University, Kyiv, Ukraine)

THE PROBLEM OF AIR LAW SYSTEM

In the article it is explored approaches to understanding of air rights in law and its place in the law of Ukraine.

In the modern jurisprudence an urgent problem is the effectiveness of the current legal science, compliance status and conditions of social life focus on solving critical social problems and to build a legal civil society. In the following context the formation of new conceptions became not by chance the main problem of the modern jurisprudence. These conceptions are referred to the Euro and integration problems of the law system development, ensuring of rights and liberty of person, harmonization of legislation, increase of the civil and legal culture. In this article scientific researches are very important, which deal with distinguishing of new branches of law in the Ukrainian law system.

Mentioned processes are reflected in the law system, which is developed by new norms of the law. The new legal institutions and branches of the law may be created by the norms of law. Thus, we must admit quite reasonable opinion, that some system can integrate new elements and to be open to the further differentiation. The question about a content, form and structure of law is the problem of jurisprudence, development of which is connected with improving of current legislation codification of the subjects (in order to improve its quality and efficiency of public relations regulation), because P. Rabinovich notices, "the system of law is the objective basis for the systematization of legislation" [1, p. 79-82].

Thus, according to V.V. Kostytsky, the legal system of each country includes such structural units as the field of law. This legal system is in constant dynamics. Other branches of the law is forming and consolidating equally along with traditional fields of law, in particular, such as constitutional, civil, criminal, administrative, financial, labor, civil procedure, and criminal procedure, commercial and procedural law. The environmental law is generally recognized as the complex branch of the law. It is still discussed the further development of economic law as an independent branch of the law, including the air law [2, p. 93] .

The historical formation of the air law in Ukraine wasn't independent for a long time, but it was presented by the legal doctrine and practice of air legislation of the USSR. Only when Ukraine became an independent country, the development of its air law was observed [3, p. 8].

In the scientific community the meaning and role of the air law are generally recognized. It's recognized as the necessary scientific background of the national domestic and foreign policy formation of Ukrainian aviation, providing of safety and efficiency of its operation and effective use of the national airspace, legal enforcement of adopted policy in this area.

Manifestation of the integrity of law is not only its division on public and private, system of law as a principle of its "life" and law development. Also manifestation of the integrity of law is the development of industrial structure of law and the formation of complex branches of law, the interaction of law and legislation, harmonization of law in the context of globalization. General criteria of the system of law division are object and method of legal regulation. The subject of the air law regulation is considered to be relations, which take place in aviation, specifically in the aviation transport section.

It is likely that such an understanding of the subject of air law is determined by the scope of previously existing Air Code of Ukraine (1993). Today the new Air Code of Ukraine has been adopted, according to which "Air Code of Ukraine regulates airspace users to meet the interests of Ukraine and its citizens and ensures the safety of aviation[5]. There are several definitions of the air law, reflecting the wider understanding of the subject of air law.

Here it is, for example, one of the definitions which is given by the Internet - "Air Law is a complex of knowledge of relevant regulations which govern civil aviation." This definition does not hold up, because it narrows the subject of legal regulation, but this definition turns to legislation, that is fundamentally wrong.

According to the authors of the textbook "Air Law" - Air Law as a branch of the legislation of

Ukraine is a holistic system of laws and acts right, which contain the principles and norms of air law. All of the principles and norms of air law are contained in Air Code of Ukraine, laws of Ukraine, Decrees of the President of Ukraine , Cabinet of Ministers of Ukraine acts, statutes, orders of the Ministry of Transport and Communications, aviation regulations, instructions, specifications, etc., issued by other public authorities [4, p. 104].

Since the independence of these issues in the state, it has been resolved two major interrelated tasks:

1) Legal framework for the natural sovereign authorities of Ukraine as an independent sovereign state according to its airspace which is located above Ukrainian territory;

2) Legal regime of airspace usage and legal provision of international air links between Ukraine and other countries.

The previous information testifies that the air legislation and air law was finally created as a separate branch in the legal system in Ukraine - [4, p. 115], interpretation of this branch is ambiguous among scholars and practitioners.

Modern air law is complex, as it contains the constitutional norms(sovereignty over the airspace), civil rights (passenger and cargo transportation, transportation of the owner of the aircraft, and aviation operations in the national economy, etc.), administrative law (the registration of aircraft and airfields, construction of facilities in areas of airports, their labelling, administrative responsibility for violations of air transport), Criminal Law (responsibility for the offense in aviation such as aircraft hijacking, etc.).

Ukrainian Air Law regulates the activities of the national civil aviation, which includes domestic flights within the territory of Ukraine, international flights in the sovereign airspace of other countries and territories outside the state (open sky), domestic passenger and cargo within the territory of Ukraine, as well as works and special services in the sphere of material production and non-production sphere, flights of foreign aircraft over the national territory of Ukraine.

In order to complete the formation of Ukrainian Air Law system it is necessary to enter to the sphere of its influence regulatory activity by separation of the structural elements of air, which next to the land and territorial waters (territorial space) is no less important part of national sovereignty - the air space of Ukraine.

That is why, a qualitatively uniform system of public relations is creating as a result of these activities of the use of air space of Ukraine created, governed by principles and norms of air law in Ukraine. This system can be divided into the following groups of relations:

- Relations which arise directly between the state (government agencies) and national airspace users both within the national airspace and beyond;
- Relations which arise between the state (official bodies) and foreign users of the airspace of Ukraine;
- Relations which emerge between national air carriers;
- Relations that occur between domestic and foreign air carriers;
- Relations which arise between operators of all types of aircraft and customers;
- Relations that arise between the state (government agencies) and entities those carry out activities of separation from the air of its structural elements [4, p. 225].

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I.O. Rozum, assistant,
(National Aviation University, Ukraine)

THEORETICAL AND LEGAL ASPECTS OF THE USE OF MEASURES OF SECURITY FOR AN ADMINISTRATIVE CLAIM BY THE STOP OF THE ACTION OF THE DECISION OF A SUBJECT OF IMPERIOUS PLENARY POWERS OR HIS SEPARATE POSITIONS WHICH ARE APPEALED, IN ORDER OF THE REALIZATION IN MATTERS IN RELATION TO THE APPEAL OF DECISIONS, ACTIONS OR INACTIONS OF SUBJECTS OF PUBLIC ADMINISTRATION IN INDUSTRY OF AVIATION AND USE OF AIR SPACE OF UKRAINE

Coming from the maintenance of part 2 article 4 the Air code of Ukraine government control of activity in the industry of aviation and the use of air space of Ukraine consists in forming of public policy and strategy of development, the determination of tasks, functions, terms of activity in the industry of aviation and the use of air space of Ukraine, the application of safety of aviation measures, acceptance of obligatory aviation rules of Ukraine, in realization of state control after their implementation and the establishment of responsibility for their violation. In this aspect an explanatory influence of the subject of public administration (which is carried out the last within the limits of clear normatively – certain and fastened: jurisdiction plenary powers, procedure and form) is directed in the plain of creation of the regulated law consequences in maintenance and structure materially – legal relationship of sides with the purpose of the achievement of the concretely certain and imperatively – conditioned right state of the model of the conduct of his subjects.

In the modern terms of the creation of the state, gradual becoming of Ukraine as the sovereign and independent, democratic, social, legal state, the processes of subsequent successive implantation into the structure of public legal relationships of mechanisms of providing of law and order and legality in the sphere of public administration acquire primary and integrative values in system intercommunication with others.

The organs of legislative, executive and judicial powers carry out the plenary powers in the limits set Constitution and in accordance with the laws of Ukraine (part 2 article 6 of the Constitution of Ukraine).

Taking into account the legal orders of part 2 article 2 of the Codes of the administrative legal proceeding of Ukraine (farther – CALP of Ukraine) to the administrative courts any decisions, actions or inactivity of subjects of imperious plenary powers can be appealed, except for the cases when in relation to such decisions, actions or inactivity another order of judicial realization is set by the Constitution or laws of Ukraine. Providing and guaranteeing the legal marketability equitable right of subject in public – legal relation in part of the appeal of decisions of a subject of imperious plenary powers in a judicial order is sure the important elements of the legal state.

The presentation of administrative lawsuit, and also openings of the proceeding on administrative case do not stop the action of the appealed decision of a subject of imperious plenary powers, but the court in the order of security for an administrative claim can stop the operation of the decision of subject of imperious plenary powers or his separate positions which are appealed (part 3 article 117 CALP of Ukraine). Taking into account the orders of the legal norm of part 1 article 117 CALP of Ukraine the court can decree a decision about the use of measures of security for an administrative claim after the solicitor of the plaintiff or on its own initiative if there is an obvious danger of damnification to the rights, freedoms and interests of the plaintiff to the decision-making on administrative business, or defence of these rights, freedoms and interests will become impossible without the use of such measures, or for their renewal it is necessary to make considerable pushes and charges, and also if there are obvious signs of illegality of the decision, action or inactivity of the subject of imperious plenary powers.

As I. Timchenko [1, p. 14] marks taking into account the possibility of the application of the simplified order of the use of the measure of security for a claim, foreseen by article 117 CALP of Ukraine, and the possibility of abusing the judicial right from the side of a plaintiff, the absence of balance of «private» interest and «public» interest of the state and society becomes obvious on the whole in to the dispute about an appeal of the normatively, – legal act. It's also necessary to emphasize that an appeal of the decision of a subject of imperious plenary powers on the maintenance is difficult judicially – by the legal instrument of providing an equitable right of a

subject proper materially – legal jural relationship the use of which influences the system of rights and legal interests of an indefinite circle of subjects, as for the initiatives of one subject the element of the legal system of the state can be abolished or changed, the action of which spreads on the wide circle of the people who do not accept the direct participating in consideration and decision of the proper administrative dispute. Thus, the fact is that the concept of «the decision of a subject of imperious plenary powers» is utilized in the structure of the construction of the legal norm of part 3 article 117 CALP of Ukraine in its general value, although, as I. Timchenko marks [1, p. 14], with all the probability, there was a decision of a subject of imperious plenary powers, which carries an individual character. Coming from a general purpose, the use of measures of security for an administrative claim is a court application in realization of which there is an administrative case, judicially – legal measures of the guard materially – legal interests of a plaintiff, which guarantee the implementation of the decreed decision accepted in connection with the presentation for his benefit [2, p. 312]. For this reason, the author of the article disagrees with a wide interpretation of part 3 article 117 CALP of Ukraine (in part of the use of such a measure of security for an administrative claim in cases in relation to an appeal of any decisions of a subject of imperious plenary powers, but not those (decisions) which carry individual character exceptionally).

Taking into account likeness of the mechanism of the legal adjusting of the order of an appeal normatively – legal acts within the limits of the legal system of the Russian Federation, it is needed to notice that judicial practice of the latter does not acknowledge the possibility of stopping the action of the normatively – legal act as the measure of security for a claim. The legal position of the Supreme court of the Russian Federation, lighted up in point 14 of the Decision of the Plenum of the Supreme court of the Russian Federation from November, 29, 2007 № 48 «About the courts practice of consideration of businesses in relation to an appeal of normatively – legal acts fully or in part» is based on that «meaning that in accordance with part 7 article 251 of CPK of the RF the presentation of the statement about an appeal normatively legal act in the court does not halt an action of this normatively – legal act, after the solicitor of declarant, a judge is not right to take measures providing on grounds, foreseen by article 139 of CPK of the RF» [3]. It is necessary to emphasize that in the Decision of the Plenum of the Higher administrative court of Ukraine from March, 06, 2008 № 2 the position was already reflected in relation to non-admission of application of positions of part 3 article 117 CALP of Ukraine in some categories of businesses by the Higher administrative court of Ukraine.

In addition, another problem aspect of application of a legal norm of part 3 article 117 CALP of Ukraine is a determination of the real law consequences of the use of such a measure of security for an administrative claim, as a stop of the action of decision of a subject of imperious plenary powers. The security for a claim is the judicial measure of a temporary character, directed on non-admission of the origin of circumstances which can complicate the implementation of the court decision. Thus, the use of measures of security for an administrative claim must correspond to the judicial purpose of an application of the legal institute of security for a claim and must not result in actual acceptance of a court decision in business, which is a legal dispute in essence decided administratively.

That's why, the use of such a measure of security for an administrative claim, as a stop of the action of the decision of a subject of imperious plenary powers or his separate positions which are appealed, on the basis of part 3 article 117 CALP of Ukraine, on the maintenance cannot result in complete renewal of the legal state materially – legal relationship between the sides of the administratively – legal dispute which existed before the acceptance of the appealed decision, as in such a case an accepted measure of security for a claim should actually be considered as a quasi-solution in case, which the lawsuit requirements of a plaintiff are satisfied.

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S.T. Goncharuk, professor
(National Aviation University, Ukraine)

ADMINISTRATIVE COERCION IN THE FIELD OF CIVIL AVIATION SAFETY

Questions about the features of the application of the administrative coercion in the field of civil aviation safety are brought up in this article.

Ensuring of the public safety and order in the field of air transport is very important considering that this mode of transportation is associated with air moving of a large number of people and huge cargo traffic.

An important component of the civil aviation security ensuring is its legal framework. Therefore appropriate measures of administrative coercion are widely used in this area along with other measures to ensure its legal security. In general, administrative coercion, as one of the main methods of the public administration, is the one part of ensuring the proper, safe and undisturbed operation of air transport.

Relevance and scientific novelty of the following issue are that today in Ukrainian science there is almost no comprehensive scientific study of the effective application of the administrative coercion measures in the field of civil aviation. Only certain aspects of these problems recently attracted the attention of scientists such as: L.M. Baran, R.T. Baran, V.K. Hizhevskyy, N.V. Darahanova, E.K. Yerashov, G.G. Retarded, L. G. Shostak, L.V. Filippov at alias.

Exploring the following issues, first of all, the concept, content and basic properties of administrative coercion, particularities of the use of its activities in the field of civil aviation should be defined, the mechanism of legal framework in this area must be clarified, the scope of administrative relations must be examined, which is the subject of administrative and legal protection of the measures, the attention of scientists, legislators and practitioners must be attracted to a number of existing problems in this area.

Administrative coercion is the application of complex enforcement measures of moral, material or physical influence on the will and behaviour of members of administrative relations by executive agencies and other competent entities in accordance with the law in order to ensure public order and public safety, prevention and suppression of offenses and punishment of offenders [1, p. 131]. This type of coercion is a form of the state coercion (in addition to criminal, civil, disciplinary coercion, etc.). It is also a system of the psychological or physical impact on the consciousness and behaviour to achieve a clear set of responsibilities, development of social relations within law enforcement and justice [2, p. 163].

The peculiarity of the administrative coercion is that its measures may be applied if offenses are present (primarily administrative), or absent.

Taking into account the multiplicity of the administrative coercion, there are different criteria for the classification of its enforcement activities, but the most of domestic and foreign scientists who are majoring in administrative law are the supporters of separation of administrative and coercion measures, depending on the nature of the impact and purpose of the application into three main groups:

- Measures of the administrative caution (preventive);
- Measures of the administrative termination;
- Measures of administrative punishment (administrative penalties) [3, p.221].

In the group of the administrative termination it is separated a distinct subgroup of the isolated measures in cases of the administrative offenses, which include:

- Bringing the offender (Article 259 Administrative Law);
- Administrative detention (Article 261 Administrative Law);
- Personal inspection and review of the things (p. 264 Administrative Law);
- Removal of the objects and documents (265 Administrative Law);
- Removal of driving and inspection of drivers for intoxication (Article 266 Administrative

Law) [4].

Often among these measures it is pointed out also administrative and remedial measures, such as coercive measures aimed to eliminate the negative consequences of the crime and the restoration of violated rights (violations of the legal status) [5, p. 285].

Usually in the field of civil aviation, administrative and preventive measures are expressed as certain restrictions and these measures are applied to ensure public safety and public order and prevention of various offenses in this area. The most common of these are the following measures: 1) request of the termination of the individual action, 2) verification of documents, and 3) an overview of things 4) temporary restriction or prohibition of the public access to certain areas or facilities to ensure public order, public safety, health, 5) restrictions or prohibition of the air transport traffic in non-flying weather or otherwise, 6) administrative supervision for people for which this supervision is determined and the control of convicts to penal sanctions in case of extradition, especially when offender is carried to his domestic country by the air transport; 7) the right to enter into and to the airport facilities in the case of a hazard (e.g. mining) and others.

Among these measures in the field of air transport it is often used different types of inspection, including technical, personal, things and goods, control the security carry-on, baggage and cargo, mail and on-board supplies; personal control of the security of passengers and crew of the aircraft; before flight inspection and maintenance of an aircraft, personal identity checks on cargo vessels, etc.; licensing; certification; sanitary and quarantine measures and others. Inspection is carried out at the airport or at the city air terminal. If some passenger refuses of the baggage inspection at the airport, the carrier has the right to terminate the contract by turning the charge for transportation less of the prescribed fee. Transitional provisions of control are used in the course of the corresponding control to ensure the safety of civil aviation, approved by the Cabinet of Ministers of Ukraine 02. 08.1995, the number 592 [6].

Thus, control in the civil aviation field is an effective coercion measures of a preventive character. Among other things, the control is carried out during the compliance with the license conditions of the economic activities such as the provision of services of the passengers and cargo with the help of air transport, and implementation of aviation and chemical works. According to "Procedures for monitoring compliance with licensing conditions for economic activity in the provision of services of the passengers and cargo with the help of air transport and licensing conditions for business aviation and chemical work implementation" control subjects entity licensing conditions for these types of activities are engaged State Aviation Service as the licensing authority and the State Committee of Ukraine for Regulatory Policy and Entrepreneurship as a specially authorized licensing body within its authority by conducting scheduled and unscheduled inspections [7].

Measure of administrative suspension is the kind of the administrative coercion which is used by the authorities (their officials) in accordance with the law and due to the course. It is aimed to force termination of offenses, eliminating their harmful effects and to ensure the prosecution of offenders.

Go to the range of measures which are used in the field of civil aviation, the following measures are: bringing the offender, administrative detention of people, vehicles, personal inspection, inspection of vehicles, goods, cargo demand to stop illegal actions, the immediate physical impact, the use of special equipment, and in cases of law, and weapons to criminals, ban use of certain objects and things (cameras, mobile phones, etc..) removal and detention of certain subjects, objects and documents, cargo, baggage, and airlines can be deprived of their licenses and permits, etc.

The administrative penalty is the last link in the system of administrative coercion. It is applied to teach the person who committed an administrative offense according to the law, to respect the rules of coexistence and to prevent the commission of administrative violations by the offender as well as by others. Specific types of administrative penalties are provided in Article 24 of the Administrative Law of Ukraine. They are divided into basic and additional, and they are imposed on those who are guilty.

By the Code of Ukraine of administrative offenses it is provided such types of administrative violations in the field of civil aviation:

- Violation of safety (Article 111 Administrative Law);
- Abuse of the aircraft (Article 112 Administrative Law);
- Violations of the international flights (Article 113 Administrative Law);
- Violation of the fire safety rules for air transport (Part 2 of Art. 120 Administrative Law);
- Violations of the transport of dangerous substances and articles on air transport (S.3 Art. 133 Administrative Law);
- Violation of rules aimed at ensuring the safety of cargo on air transport (Art. 137 Administrative Law) [4].

By committing these offenses it can be imposed such administrative sanctions as: warning, fine, chargeable withdrawal subject that has become an instrument of the commission or the direct object of an administrative offense, confiscation of the object.

The special features should be included of the application of administrative responsibility in the field of civil aviation. It is that cases of administrative violations in this area but officials authorized to consider air transport and other entities of administrative jurisdiction, which are very difficult to review. In particular, people, who can consider cases on administrative violations in this area, are: the head of the specially authorized executive body in the field of civil aviation of Ukraine and his deputies, Chief Inspectorate of the specially authorized executive body in the field of civil aviation of Ukraine and his deputies, inspectors and regional Inspectors specially authorized executive body in the field of civil aviation of Ukraine, heads of airlines and airports and their deputies, chief of transportation airlines and airports, aircraft commanders, officers authorized in the field of transport, carrying out control and audit functions, chief sanitary and epidemiologic department, officials of the transport police, judges and others. In the field of legal regulation of safety in civil aviation available not resolved problems are. These problems are required a further legislative solution. In particular, it concerns the issue of timely removal of the aircraft control by pilots and other crew members who are in a state of intoxication, and it is important to bring them to justice in the future.

The provisions of Art. 130 Administrative Law are not concerned to pilots who control an aircraft being intoxicated. However, such cases of control are numerous. Therefore it is necessary to establish a severe degree of administrative responsibility for the category of violators by making appropriate amendments to Administrative Law.

Some other defects of the administrative and tort law are negative, including some gaps, ambiguity of terms, conflicts between national and international legislation on the issue of qualifications of certain acts which infringe on the safety of civil aviation. Sanctions of provisions of the Administrative Law are outdated and ineffective, which establish liability for administrative offenses against the security of civil aviation. In addition, Administrative Law in the following part is characterized mainly with not quite completed structure of law, often specifying, where the norm is referred by the Code. It would be useful to explain in Administrative Law, what is meant by the term "rules of international travel" to clarify the disposition of Art. 113 Administrative Law and so on. It should be supported the proposal of A.V. Filippov due to expediency of administrative liability for violations of airspace and for violations of the aircraft safety, unless it is led and could be led to serious consequences. Such violations are quite common and they threaten to flight safety [8, s.72]. To bring the national legislation and legislative activity due to the European standards, it is important to develop common rules for the approximation of the national legal framework governing civil aviation, to the relevant provisions of the European Union, approved of the Concept of the legal framework of civil aviation of Ukraine in view strategy of integration into the European Union Regulation on Code of aviation regulation in Ukraine. [8, s.72]

Thus, it should be noted that administrative coercion plays a leading role for the proper security in the civil aviation, prevention of various offenses, and in the fight against crimes in this area.

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O. Gusar, senior teacher
(National Aviation University, Ukraine)

AIRCRAFT STAFF AS A SUBJECT OF AVIATION ACTIVITY

Determined the place of aircraft staff among subjects of aviation activity. Reviewed the notion of "aircraft staff" and its legal personality. Established the dependence of professional and coordinated activities of aircraft staff in aviation activity as being focused on the safety of air transport.

Satisfying the needs of the population at a quickly overcoming distances in comfort, luggage transportation accomplished by air transport.

Indicators of airlift growth show on a huge demand and need for the development of air transport. So in general over the past 11 years (except 2009) the volume of passenger traffic of Ukrainian airlines has increased almost 6 times. It should be noted such factors as expanding route network, increasing the intensity of flight dominated areas along with updated fleet positively affect the performance of domestic airlines activity.

In 2011 the services of Ukrainian airlines flew 7.5 mln. passengers that is almost 23 percent more than in 2010. The number of domestic airlines transported cargo and mail in this year amounted to 92.1 thousand tons, which is 4.8 percent more than the previous 2010. Overall in 2011, regular flights between Ukraine and world countries carried out 9 domestic airlines (to 48 countries) and 56 foreign (from 33 countries). During the year, Ukrainian air carriers started operating on a regular basis for 13 new international routes.

Civil aviation activity cannot be considered without realization that Ukraine is one of the few countries in the world carries the complete cycle of aviation activities - from designing aircraft engines and aircraft for operation, maintenance and repair. Educational and scientific activities are also important, since they provide training, efficiency and safety of aviation industry.

According to E.P. Zhelibo, N.M. Zawerucha, V.V. Zatsarnoho, the activity is specifically human form of activity, a necessary condition for the existence of human society, which has included in the deemed change and transformation in the interests of human environment [1, p . 18]. This view is shared by other scholars, such as Y.O. Chyrva and O.S. Babiak, who believe that activity - a specific form of relationship to the world, which content is deemed its change and transformation in the interests of people, which includes the purpose, features, outcome and the process [2, p. 6].

Thus, human activity - it is always special, specific expression of human activity.

State through implementation of the sublegislative, organizational, executive and management activities of state authorities (mostly executive) influences on all subjects of legal relations in civil aviation.

Aviation safety should be understood as a complicated complex phenomenon that consists of many elements: aviation safety, environmental, fire, aviation safety information, which causes the complexity of relationships and their subjects. Subjects of aviation relations - are members of the relationships with legal personality, endowed with certain rights and duties enshrined in the legal norms. Legal personality implemented through capacity (ability to have rights and duties), capacity (the ability to implement given rights and duties) and delictual dispositive capacity (bear legal responsibility).

The ability of subject of aviation jural relationships independently, strong-willed, conscious actions (directly or through a representative) to realize the rights given to him and fulfill his obligations (capacity) is shown in the real behavior (activity) of specific subjects.

In general, the volume and content of legal personality of Ukraine aviation staff is determined by laws and issued based on legally normative acts, which contain the relevant rules of law. The exact amount of rights, duties, responsibilities of Ukraine aircraft staff set by standards of administrative law is determined by a number of circumstances such as age, health status, availability of appropriate education, qualification, authorizations, certificates of such persons, etc. and is regulated by many normative acts of administrative and legal nature, including aviation rules,

statutes, regulations, qualifying characteristics, etc. [3, p. 61.15-61.19].

Special rights and duties of Ukrainian aircraft staff are derived from fundamental rights, freedoms and responsibilities of legal subjects stipulated by the Constitution of Ukraine.

Under aviation activity is understood organizational, industrial and scientific activity of natural and legal persons with aim of airlift requirements satisfying, implementation of aviation operations and services. Analogous interpretation of the definition of "aviation activity" occurs in a number of regulations, namely: Air Code of Ukraine of 19.05.2011 № 3393-VI, Order of 05.07.2010 № 430 "On approval of Rules certification of operators engaged in operation of civil aircraft for the purpose of commercial transportation in accordance with OPS 1", Order of 9.02.2010. № 68 "On approval of the Provision on Inspector of air monitoring at the State Aviation Administration", Order of 19.05.2010r. № 256 "On approval of Rules on investigating aviation accidents and incidents in aviation of the Armed Forces of Ukraine."

The system of the subjects of administrative and legal regulation of flight operating safety rules include the President of Ukraine, National Security and Defense Council of Ukraine, Cabinet of Ministers of Ukraine, and central government bodies (including the Ministry of Infrastructure of Ukraine, Ministry of Internal Affairs, Ministry of Ecology and Natural Resources of Ukraine, Security Service of Ukraine), the Council of Ministers of Crimea, local state administrations and local governments (especially in the environmental safety of aviation) and several others. Most of these bodies carry out administrative and legal regulation of flights safety within the exercise of their basic functions. President of Ukraine as the head of state, guarantor of the Constitution of Ukraine in accordance with art. 106 of the Constitution of Ukraine ensure the national security state, and thus a portion of - flight safety.

A special place in the system of aviation activity occupies aviation staff. By definition of aircraft encyclopedia, aviation staff – is workers of civil aviation whose activity is directly associated with its use.

The term "aviation staff" was firstly introduced in legislation in the former Soviet Union in 1983. Then, according to Article 7 of the AC of the USSR, it was determined that workers of civil aviation whose activities are directly aimed at the objectives of civil aviation belong to aviation staff [4].

Legislatively determined that aviation staff – are people who have had special professional training, with a certificate and carry out flight operations, aircraft maintenance, air traffic management, technical operation of ground communication, navigation, surveillance, (Article 1 item 9 of AC of Ukraine).

A person who belongs to the aircraft staff must meet the requirements to the qualification sign for occupational, state of health and a properly executed certificate in accordance with Ukrainian aviation regulations.

So, from people of aviation staff depend the implementation of flight operation, testing and maintenance of aircraft and air navigation services, air traffic and airspace use, and flight safety and aviation security as a whole.

In this connection, to the people of aircraft staff AC of Ukraine has established the following imperative requirements (Article 49 of AC of Ukraine):

- firstly, a person who belongs to the aviation staff must meet the requirements to the qualification sign for occupational, state of health and a properly executed certificate in accordance with aviation regulations of Ukraine.

- secondly, certificate is issued separately for each specialty for people of aviation staff. In the certificate can be carry marks on performing of some functions provided by other specialties.

- thirdly, person from aircraft staff must have a certificate during the professional activity and conduct such activity in accordance with the conditions and limitations provided be the certificate.

Persons who are not belong to aviation staff are allowed to aviation activity in the order prescribed by the appropriate authority of government regulation of aviation of Ukraine. All aircraft staff consists of certain individuals - "aviation community" or "aeronautical community". Investigation of the use of these terms [5], lets to make a conclusion that the term "aviation

community" or the term "aeronautical community" is used to denote the same concept (different translation from Russian of "aviatsionnyi spetsialist"), and therefore these terms are synonymous. “Aviation community” / “aeronautical community” - these are individuals who have had special professional training and are the owners of the relevant certificate of aviation staff.

Thus, in Ukraine (Art. 49 of AC of Ukraine) [6] found that the presence of the certificate is required for such specialties persons of aircraft staff:

1) the pilot of the aircraft;
2) manager of air traffic control (air traffic controller);
3) staff of the maintenance operations of aircraft;
4) test crew members;
5) a member of the crew of the passenger cabin (cabin crew);
6) flight operations officer.

Complement of aircraft staff can be determined, depending on different criteria in different ways. The provisions of the Convention on International Civil Aviation (ICAO) aircraft staff is divided into two groups - depending on the flight, or on the ground person of aircraft staff performing his professional duties.

The first group includes individuals of aircraft staff who perform their main functions certainly in the flight.

This group includes as persons of flight crew, as defined in the above Appendix 1 and all others of the crew of an aircraft, for example, flight radio operator, operator, cabin crew, as well as those inspectors and instructors, whose functional duties include responsibilities for overseeing the activities of persons of the crew of an aircraft in flight. This group may also belong to other categories of aircraft staff persons who perform basic duties in flight (persons who perform management of flight test services and participate in research as members of the flight crew).

The second group includes aircraft staff individuals who perform their main functions certainly on the ground.

This, above all, the experts performed in regulation and air traffic services; specialists performed in the organization and maintenance of aircraft and all kinds of flights specialists performed in aviation security and aviation safety in general and other individuals. These individuals of aircraft staff traditionally defined as "ground aircraft staff" [7], or using the terminology above, Appendix 1 - "other aircraft staff".

In Russian Federation compliment of aircraft staff established in the other way.

By Article 52 of AC of the Russian Federation [8] determined that aircraft staff includes: aircraft staff of civil aviation, aircraft staff of state aviation and aircraft staff of experimental aviation.

That is, in basis of division of aircraft staff in the Russian Federation selected criterion of staff belonging to different types of aviation, namely:

firstly, to civil aviation - aviation, that is used to secure the needs of citizens and the state economy;

secondly, to state aviation – aviation that is used for performing military, border, police, custom or other public service, as well as for mobilization and defense missions;

thirdly, to experimental aviation - aviation that is used for research and development, experimental, research, and to test aviation and other equipment.

Summarizing, we can conclude that there is no single, sustainable division of aircraft staff. Depending on various criteria, composition of the civil aviation staff is defined differently.

Resolution of the Ministry of Transport of Ukraine of 17 July 2002 N 488 approved Handbook occupations job descriptions of employees "Air transport", which clearly defined classification of professions leaders, professionals, experts, technical staff and workers. In Handbook issued rights and duties, what "must know", qualifying requirements. In addition to the requirements set forth in the respective job descriptions, workers of air transport should know and do follow the rules and regulations on labor protection, labor health, fire safety, electrical safety, safe conduct of work, perform internal labor rules.

The main components of administrative and legal status of aircraft staff of Ukraine are: the corresponding rights, duties, access to professional activities, and legal responsibility of aircraft staff.

Category of administrative and legal status allows to consider the rights, duties, responsibilities of aircraft staff of Ukraine in integral, systematic and determined as not only the potential ability of aircraft staff to participate in administrative and legal relations, but his real involvement in this relationship. And if the general (constitutional) status of individual and citizen is characterized by a certain constancy, static according to all persons and citizens, it contains in the rules of constitutional law and is independent of changes in various specific circumstances, the administrative and legal status of Ukrainian aircraft staff is quite dynamic, agile, characterized by constant development, which is associated with the development of the field of civil aviation of Ukraine and, accordingly to this, with the development and improvement of its legal framework.

The question of responsibility of aircraft staff of Ukraine as a subject of delinquency on air transport is necessary to determine not only depending on the nature of the delinquency but also on the conditions of its commission, department participation, time and place of perpetration. That is why amenability may be administrative, disciplinary, criminal.

For example, "civil aircraft staff who is not officials" is the largest number of subjects of aviation activity. To this subgroup we refer natural persons with whom was concluded the labor contract and who working in enterprises, institutions and organizations of civil aviation sector as a permanent and part-time as people whose work is governed by labor law. Similarly to the same subgroup belong persons who are working under civil contract (by labor agreement) in the field of civil aviation. Aircraft staff referred in Article 49 of AC (cockpit crew of an aircraft, co-pilot, panel operator, attendant, etc.) is a group of civil aircraft staff who is not officials.

Analysis of regulatory legal acts lets to set that group - "aircraft staff who are officials of bodies of air transport" includes officials of enterprises, institutions and organizations irrespective of ownership and subordination, subject to administrative responsibility for the delinquency, associated with incompliance established safety rules and other regulations on air transport if observance of the adopted rules of flight safety and other standards included in their employment duties.

Type of legal responsibility (administrative, criminal and etc.) may depend on the natural person’s status, "head" or "subordinate". In the process of government orders of the head between the head (official) and subordinate (sendee of the power available) set defined legal connection, which causes the occurrence of the relevant legal consequences of rights and duties of the executor, who shall perform the disposal of officials. It is, however, the presence of official powers in relation to employees provides for the presence of the head (official) higher compared with other persons, administrative responsibility for one and the same delinquency.

There are situations when, for example, administrative delinquency committed by "aircraft staff (e.g., pilot of the aircraft) is not in the performance of his official duties but during his legally prescribed rest time.

Unlawful activity (action or inaction), errors of people of aircraft staff, who took part in preparing and ensuring flights, are often directly affect the ability to ensure the safety of flight in one way or another, sometimes quite difficult and special situation.

That is why the successful solution of targets of providing with flight safety in general and safe activity of aircrafts staff particularly depends on how clearly, systematically, at all levels, operate all subjects of civil aviation as well and smoothly functioning air transport system. Thus, the activity of all subjects of civil aviation should be focused on prohibition, prevention of air accidents, and in case of attack - to minimize the negative consequences of these events and carried out systematically, consistently, purposefully.

Strong companies that care about safety as a priority component of the aviation business and about its own image, pay much attention to skills development. The good reputation of the airline shows the appropriate level of professional training.

Today there is not only a practice of aviation specialists training in Ukraine but also abroad,

the State Aviation Administration has the authority to recognize training of aircraft staff. The reason of the recognition of its training is to show the appropriate knowledge and skills of the candidate, the assessment of which is determined by the State Aviation Administration.

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O. Begliy, Ph. D. (Law),
(Nation Aviation University, Ukraine)

SATELLITE NAVIGATION: HISTORY AND PROSPECTS

In the article the organizational-legal problems of the creation of the Global navigation system with the use of space technologies

Introduction

Today we are witnessing significant growth of the intensity of continental and trans-oceanic transport stream. Continue to improve marine and air transport, and the sizes of ships and aircraft are gradually growing. At the same time, was gaining momentum new type of transport - space, which until that serves only space tourists, but not far off its entry into impressive in its scope and objectives of the programme the development of the resources of the moon and deep space. All this puts on the agenda of the increased requirements to the safety of navigation. Even security is significantly busiest Maritime routes and air lines can be achieved best by subject to the mandatory use of satellite navigation [1-4].

Historical preconditions

The first space navigation system (SNS) GLONASS (the USSR, since 1991 - Russia) and NAVSTAR (USA) have been developed as an exclusively military. However realities of today have shown not only the economic benefits of the use of these satellite systems for the solution of the national problems of control of motion, but also found political aspects, allow you to integrate the efforts of the international community for the progressive development of space navigation, not letting go of the field of view of questions of national safety of Russia and the United States.

Moreover, despite the certain successes in cooperation between the Ministry of defence of the USA with the U.S. Department of transportation, civil users continued to perceive the SNS NAVSTAR, first of all, as a military system, and to feel the lack of confidence in the possibilities of its structure fully meet their needs. Therefore, it was natural enough grounds of the USA in the beginning of 90-ies. SNS civil purpose DPS (Global Position System), which became, thus, the first real component of a future Global navigation satellite system (GNSS).

As in the case of the SNS NAVSTAR, the jurisdiction of defence of the Russian Federation over the GLONASS system impedes its use of civil users. In the opinion of Russian lawyers contradictions between integration trends and national security requires additional efforts to reach a reasonable compromise. Nevertheless, given the monopoly of the USA on the market of such services and proximity of operational characteristics of the GLONASS up to the standards of the United Europe, international users still interested in large-scale use of the SNS Russia.

Decisions X ICAO Navigation conference

On the X ICAO Navigation conference, which took place in 1991, the United States initiated the use of national SNS to provide international air transportation for a term of 10 years, and two years later had offered ICAO and IMO the use of GPS as a component of Global navigation satellite system (GNSS). After that the Russian authorities have acted with the initiative regarding the use of SNS GLONASS for the same purpose.

In 1996, the ICAO and the IMO adopted the above mentioned proposals of the us and the Russian Federation on the use of space navigation systems GPS and GLONASS as components of a future GNSS.

In recent years much attention to the development of space navigation means the EU, with which Ukraine has agreements on participation of the national space industry in the creation and the development of a European satellite navigation system GALILEO.

But, nevertheless, there is still a certain number of contradictions, which constrain the use of national and regional space-based navigation systems for the construction of a future GNSS.

Firstly, by this time, virtually ignored the necessity of accounting for expenses related to the

establishment of national or regional component of a future GNSS.

Secondly, despite the wider understanding and recognition of the benefits associated with the use of satellite navigation, there is a threat that is not all groups of users (aviation, marine, road and rail transport, etc.) will have the opportunity to achieve their requirements in the development of a future GNSS.

Third, there are serious concerns in terms of how costs associated with the establishment and operation of the future GNSS will be equitably shared between users. Proceeding from this, the most relevant was the elaboration of possible ways of international legal solution of the problem of large-scale use of civil users of the existing pumping station with the prospect of transition to a future GNSS.

Recommendations UNISPACE III and UN General Assembly

Process the creation of international legal base of the future GNSS «gained a momentum» after consideration of this issue in the framework of the UNISPACE III and subsequent recommendations of the UN to address the UN Committee on Outer Space and ICAO to improve their coordinating role in the area of creation of such a database.

In particular, in the documents of the UNISPACE III was written «program of concrete actions»:

- to create a global multi-functional satellite system of navigation and positioning on the planet in the first place to provide a high degree of regional and global cooperation;
- coordination of actions of the interested States and international organizations in the exploration of the possibilities of individual SNS for the assessment of their compatibility and the development of subsystems of the second generation;
- ensure that international legal tools provided with continuous access to global navigation satellite signals civil users;
- determination of the authoritative international organizations ICAO, IMO and the International Telecommunication Union (ITU) responsible for the implementation of measures for the protection of the radio-frequency spectrum in which there are all of GNSS to interference from other radio transmitters, or redistribution of these the frequency with commercial interests [2, C.56].

While the «program of concrete actions» - it is rather the organizational basis of cooperation of States with international organizations directly concerned in the construction and subsequent operation of GNSS. At that, the «measures»almost ignored the necessity of accounting for expenses related to the creation of the above-mentioned system, that is, the costs of which shall be equitably divided among the owners of the existing pumping station and the different categories of States-users: the holders of the regional or national complementary segments, designed and the States which are only consumers of the services.

In 2001 there was established the Working group on GNSS, the main result of four years of work of which was the creation, in 2005, on a voluntary basis of the International Committee on global navigation satellite systems (ICG). In the ICG includes two States with national The pumping station (DPS - the United States and GLONASS - the Russian Federation), member States of the EU (GALILEO), as well as UN member States (including Ukraine), which shall make efforts to GNSS development and the use of its capabilities with a view to the use of space technologies. In addition, several authoritative international organizations (among them the United Nations Committee on outer space and ICAO, ITU, COSPAR), are involved in establishing the standards of use of satellite navigation signals and contribute to the application of new technologies.

Pursuant to the recommendations of UNISPACE III in 2001 there was established the Working group on GNSS, the main result of four years of work of which was the creation, in 2005, on a voluntary basis of the International Committee on global navigation satellite systems (ICG). In the ICG is composed of two States, with the most developed national pumping station (GPS - the United States and GLONASS - the Russian Federation), member States of the EU (GALILEO), as well as member States of the UN Committee on Outer Space, which shall make efforts to GNSS development and the use of its capabilities with a view to the use of space technologies. In addition, several authoritative international organizations (among them the UN Committee on Outer Space,

ICAO, ITU, COSPAR) participate in the development of standards of use of satellite navigation signals.

UN GA Res. 61/111 of 14 December 2006, the UN General Assembly the International Committee on global navigation satellite systems was recognized as an informal body for the development of space navigation [8, P. 8].

ICG and the first achievements

For the implementation of its activities the International Committee on GNSS (ICG), has created four working groups:

- Working group A on compatibility and interoperability of navigation systems. Presiding over the Russian Federation and the United States.
- A Working group B to improve the quality of GNSS services. Preside India and the European Space Agency.
- Working group C on the dissemination of information to consumers. Chaired by the UN Office for Outer Space Affairs.
- Working group D on interaction with national and regional administrations and international organizations. Chairing the International Federation of Surveyors (FIG), the International Association of Geodesy (IAG) and the International GNSS Service (IGS).
- The International Committee on GNSS set up another working body, the Forum providers, consisting of the main owners of the existing and future GNSS and their augmentations - the us, Russia, EU, China, India and Japan.

The development of global navigation satellite systems (GNSS), beginning with the individual programs to the present time has reached such a level, when the world was created or designed already been many such systems and their functional additions. In the future a variety of international and national programs will exist in parallel, providing support for a variety of interdisciplinary and international events.

In the course of discussions at the national, regional and international levels, it was repeatedly emphasized that GNSS can be used successfully in various fields. As new GNSS and regional augmentations is becoming increasingly crucial question on the coordination of programme plans of existing and future operators in order to improve the efficiency of services of GNSS.

At the present time in addition to ongoing work in their area of all ICG working groups involved in the organization and carrying out of the numerous regional workshops on training and infrastructure development, with an emphasis on capacity-building in developing countries [9, P. 3-5].

The work of the UN Office for Outer Space Affairs in the framework of the programme on GNSS applications is conducted on the following directions: (a) training for capacity-building in developing countries; (b) promote the use of GNSS technologies for scientific and applied research; (c) the implementation of the International initiative for the space weather; (d) organization of regional workshops on GNSS applications [10, C.2-3].

Conclusions

At the present time in the world there are two SNS with the claims on the status of GNSS, built on the basis of KA NAVSTAR and SPACECRAFT GLONASS, each more or less specific features of the Global navigation satellite system. However, if the GPS, with the orbit of the Earth full grouping within 24 NAVSTAR satellites can provide the provision of navigation services in the global dimension, the Russian segment, unfortunately, still can not boast the same level of services. These circumstances do not yet allow us to speak about the closest prospects of the completion of construction of GNSS on the principles set forth in the Report of the ЮНИСПЕЙС-III.

Therefore, the international organizations as well as individual state, probably, will want to independently oversee they created systems that complement GPS. Such surveillance can be provided in the international or regional agreements.

Despite the widespread understanding and recognition of the benefits associated with the use of satellite navigation, there is a threat that not all groups of users (aviation, marine, road and rail

transport, etc.) will have the opportunity to achieve their requirements in the development of systems of the second generation. There are also serious concerns in terms of how costs associated with the establishment and the operation of the system can be fairly shared between different users.

But, of course, only the development and adoption at the UN level of generally accepted principles of construction and use of a future Global navigation satellite system can give a significant impetus to the process of international-legal support.

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Z.I. Boyarska,
Candidate of historical sciences, Assistant Professor,
(National Aviation University, Ukraine)

NEW ASPECTS OF LEGAL REGULATION OF THE USE OF AIR SPACE IN UKRAINE

The article analyzes the current state of legal regulation of the use of Ukrainian airspace by aircrafts of state and civil aviation, and airborne vehicles.

Over the independence years Ukraine has witnessed the formation of air law within its legal framework. This is due to the fact that since 1991 Ukraine has been solving inter-related tasks: on one side – the legal enforceability of the sovereign state power of Ukraine as a state of international law to its airspace, on the other – establishing the legal regime for the use of airspace of Ukraine.

It should be noted that over Ukraine's independence years scientists have conducted research into certain aspects of the air law of Ukraine, which has shaped a specific approach to defining the essence and place of the air law in Ukraine's legal framework, and this approach has received a rounded reflection in "Air Law of Ukraine" [1], the first textbook published on the post-Soviet terrain. This initiated the research and studying of a new branch of law.

In this relation we should state that the object of scientific research was mainly activities of the civil commercial aviation. Undoubtedly, its activities are the most vital part of aviation activities in the broader meaning. However, it should be mentioned that present-day aviation activities also involve the usage of various airborne vehicles – from air-balloons and aerostats to unmanned vehicles. Yet the matters mentioned here haven't received any coverage in print during Ukraine's independence. Given the above this issue is indeed relevant and presents scientific as well as practical interest.

Let us point out that in the Air code of 1993 a civil aircraft denoted aircrafts engaged in air transportation of passengers, mail, cargo [2, Article 15]. In the same article the aircraft qualified as state aircraft if it was used by military, customs, border and police services, and was registered in the state register of state aircrafts. As to other types of aircrafts, the Air Code of 1993 singled out experimental aircrafts designated for testing, research, development and technological works, as well as aircrafts of sporting purposes, amateur design aircrafts, aerostatic aircrafts and auxiliaries affecting flight safety [3].

In this connection it should be noted that the new Air code legally formalized segregation of aviation into state and civil [4, Article 4 i.4]. Namely, civil aviation carries out air transportation and aviation works, as well as flight operations for personal purposes and is divided into commercial aviation and general aviation - the so-called "small aircraft" used in private purposes and regulated by simplified rules and requirements. Thus, the concept of small aircraft has been formalized in the Air code of Ukraine.

Having made legislative segregation of aviation into state and civil, the legislator had in mind that all aircraft belonging to one or another type of aircraft realize their mission through the use of airspace.

So, along with the definition of an operator of airspace, which was put into use by the Air Code of 1993 [5, Article 5], it also legally formalized introduction into usage of the notion of Ukraine's airspace users - individuals and legal entities that in due course have the right to all activities related to the use of air space of Ukraine [6, Article 1, p.53].

Among the users of airspace the Air Code also singles out unmanned aerial vehicles (UAV), whose scope of use is constantly increasing.

The development of UAVs started in some countries as early as the 60 of the XX century, with planned use in intelligence sphere for the purpose of special operations behind enemy lines, obtaining intelligence, patrolling the sea and land borders, detecting illegal movement of military forces, usage in local wars and armed conflicts, given that the UAVs can be continuously over a

certain area with the change of vehicles in the air.

In recent years problems to be solved UAVs, significantly expanded: radio electronic effects, the ability to participate in "psychological warfare" shock attacks, suppression of enemy air defenses, the use in fighting drug trafficking, carrying out search and rescue works, in meteorology, communications and relay organization, monitoring of the territory and waters, large industrial plants and railroads, ports, pipelines, power lines etc..

So, it is already widely believed that the creation of new highly efficient unmanned systems and expansion of the range of tasks will lead to the formation of a new type of aviation - unmanned.

However, the legislation of Ukraine for a long time did not provide for the legal classification of aircraft and the legal status of the UAV.

Given the widespread use of the UAV in current conditions, they are already referred to as air traffic participants. Thus, the new Air Code of Ukraine states that unmanned aircraft shall be an aircraft designed for flight without a pilot on board, whose flight management and control are exercised by a special control station that is located outside the aircraft [7]. However, given the size of such devices, in Ukraine the State Register of civil aircraft of Ukraine does not register unmanned aircraft with weight not exceeding 20 kg and those that are used for entertainment and sports activities [8].

The importance of using UAVs cannot be overestimated – both in military and in civil spheres. According to Defensetech.org, the total of 32 countries are currently developing over 250 models of unmanned aerial vehicles [9].

Ukraine is an active developer of such aircraft. They regularly find their place at international and domestic exhibitions at booths of "Ukrspetsexport" in France, India, UAE, Ukrainian "Aviasvit XXI" and others. Domestic UAV developers pay attention to increasingly expansion of their range of application - from purely military sphere to the civil one.

For the development of this promising trend, in Belarus there is a special governmental scientific and technical program "Multipurpose unmanned aircraft systems and technology of their production". In the U.S. and the EU there are also promising research projects, in particular, DARPA, within whose framework there are experiments to create a multi-UAV that can stay in the air without maintenance for 5 years [10]. Such UAVs often make flights at an altitude of 15240 m and above are invisible due to their small size.

Research programs within the Single European Sky SESAR (European Union) and Next Gen (USA) aimed to meet the growing demand for air transportation in the coming decade due to airspace capacity while increasing safety and reducing the negative environmental impact.

A wide range of application of UAVs was shown at the first Moscow Exhibition "Unmanned Multipurpose Vehicle Systems UVS-TECH". It attracted over 30 leading Russian enterprises and major companies from Great Britain, Italy and Israel. Some UAV models, presented at the exhibition, have a universal power-plant and, when using removable sets of equipment, are intended for aerial photography, broadcasting and rebroadcasting of television and radio signals; conducting environmental assessments; delivery of medicines, food, mail; provision of emergency assistance in the elimination of accidents and disasters in remote areas and areas dangerous to humans; conducting engineering, radiation, chemical, biological prospecting; delivering emergency special cargo (up to 300 kg); monitoring the situation during wildfires and peat fires, ice reconnaissance, air monitoring of TEC [11].

We can say that nowadays UAVs represent one of the most fast-growing sectors of not only military industry but also in civilian areas. Thus, over the past 5 years the number of unmanned aerial vehicles in the U.S. and EU in the defense sector has increased 136 times, and in other non-military areas it has increased 50 times [12]. So today it is accepted that UAVs offer a new promising direction for the activity of the modern aerospace industry of the leading countries of the world.

This drew particular attention at the unmanned aircraft issues conference that took place in Brussels (2011) under the auspices of the European Defense Agency (EDA) and the European Commission. The event was attended by over 450 government representatives and industry

representatives from all EU countries. Thus the conference analyzed the prospects for UAVs production and technological development and the prospects for expanding the scope and economic effect of such activities. Special emphasis was placed on the dual purpose of UAVs, the possibility of their use for both civilian and military tasks [13].

Thus today financial benefits of the use of UAVs and their greater environmental safety are obvious. With a wide range of tasks UAVs can perform, they allow to significantly reduce the risks to human life when used in high-risk operations.

According to the information of the European Defense Agency, which was distributed at the conference, this sector offers a promising chapter for the entire aerospace and aviation industry of Europe where the European Defense Agency and European Commission already share common tools for innovation implementation in a wide range of business and small and medium enterprises.

Considering the above one can find the regulation concerning unmanned aerial vehicles trafficking by the joint civil and military system of air traffic of Ukraine set in the new Air Code of Ukraine quite reasonable (14, article 8). As for flights of foreign civil unmanned aerial vehicles, they are to take place only subject to the special permission of the competent authority for civil aviation, which is issued in accordance with the Ministry of Defense of Ukraine within the procedure prescribed by the aviation regulations of Ukraine [15, article 46, p.5].

Still it should be noted that, unfortunately, the new Code remained lacks any clearly stated regulations on the activities of private, business, sports, small aircrafts, and operation of public aviation organizations.

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Y. Yeryashov, S. Homyachenko
(Nation Aviation University, Ukraine)

ADMINISTRATIVE-LAW REGULATION SAFETY OF AN AIRCRAFTS FLIGHTS

This article is dedicated to the complex concept of "safety of an aircraft flights" as defined in national legislation and its own view on the definition of this category.

The appearance of aircraft heavier than air and capable of flying both within the territory of registration and more than one state, which later was named "aircraft" was needed in the national and international legal regulation of flight. One of the aspects of legal regulation of aircraft safety is the use of high-tech and science intensive products, such as an aircraft.

Signs of an aircraft is that it is an aircraft that is kept in the atmosphere due to its interaction with the air other than interaction with air reflected from the earth's surface and can maneuver in three dimensions.

According to the Air Code of Ukraine of 19.05.2011, № 3393 - VI (item 20, part 1 of article 1) "aviation safety state civil aviation sector in which the risk of job losses to people or property is reduced to an acceptable level as a result continuous process of determining the level of risk and control it and kept at a level or declining further in the areas of aviation safety, aviation security, environmental protection, economic security and information security. "A flight safety as part of aviation safety «state in which the risk of injury or damage is limited to an acceptable level" (paragraph 21 part 1 of Article 1 of this Code) [1].

Terminological definition of the flight of aircraft in the national legislation was first given in the Air Code of Ukraine in 1993 "during the flight of an aircraft shall mean the moving of airspace and crash" (part 2 of article 51) [2].

If we consider the flight of an aircraft from a legal point of view it can be defined as "institution of national and international air law in the course of which certain subjects of national and / or international law, enter into relations governed in accordance with the regulations rules of national law or national legal and international legal systems to achieve specific objectives in accordance within the sovereign or the sovereign and the open air space" [3, p.356].

The issue of safety remained and will remain relevant as long operated aircraft of different purposes, including aircraft and civil aviation. Is constantly improving the design of aircraft, means and methods of operation, pilot training, issue airworthiness aircraft, air safety, which is constantly under review by representatives of operators and research institutions. These processes represent most acute problem of lack of new methods of management of safety, identifying threats and appropriate sources danger's of air transportation, and then continue to become more relevant [4, p.85].

In the State program of aviation civil aviation security definition of "flight safety" is missing. However, describing the features of the act of unlawful interference with the legislature uses the phrase "endangers the safety of an aircraft in flight" in several interpretations. And only when describing the act of unlawful interference as unlawful and intentional use of the device, substance or weapon used category "Safety" (but in the airport, airport) [5].

The literature of civil aviation safety be discussed as an integrated process that provides safety, protection of civil aviation against acts of unlawful interference (aviation safety) and environmental protection from the harmful effects of air (environmental safety) [6, p.312]. The same position justifies in their work and A. Filippov, which considers the safety of civil aviation as part of transport security, which in turn is part of the national security of Ukraine and concluded that the safety of civil aviation including flight safety, aviation safety, environmental safety of civil aviation [7, p.9].

At one time in 2009 by the Cabinet of Ministers of Ukraine № 273 on March 5, approved the Conception of the State program of flight safety to 2015. In our opinion, the program would be an effective tool in ensuring the safety defined ways and methods of problem solving and the expected results and determine its effectiveness. Unfortunately, due to certain reasons the said order was canceled in April 2012.

In terms of flight safety system approach should be seen as a systemic phenomenon.

Therefore, the order of the State Service of Ukraine for Aviation Safety of 25.11.2005, № 895 approved the Regulations on the management of flight safety in aviation. This order of flight safety - a comprehensive description of air transport and aviation, which determines the ability to operate without threat to life and health and safety management system - a structured and documented system that enables operations personnel to provide effective security operations.

In literature, the technical direction the concept of "Safety" is defined as a "complex characteristics of air transport and aviation operations, which determines the ability to operate without threat to life and health" [8, p.551].

Safety as a complex phenomenon that depends, in our opinion, the following factors:

−firstly, the state of airworthiness of the aircraft;

−secondly, from meteorological conditions that use the aircraft depending on its tactical and technical characteristics;

−thirdly, the human factor, therefore the ability and the ability to use acquired skills and knowledge of members of the crew in its use in flight situation that fall under signs "safety of flights".

Of course, this is not an exclusive list of factors that affect on the safety of aircraft operations.

In legal encyclopedia regulation is determined as the State's using all legal means might impact on social relations with a view to streamlining, consolidation, security and development, and impact on behavior and consciousness of citizens by proclamation of their rights and responsibilities, setting specific permissions and prohibitions, adoption of new regulations, etc. [9, p.369].

Administrative-law regulation of social relations in every area of existence of society and human activities including regulation of safety of aircrafts, is derived from the definition provided by regulations. Given the above, we can make a conclusion.

Conclusion

Given that atmosphere air and international airspace is a common property of mankind and the airspace over the territory of the state is the national territory, we can provide the following definition of administrative-law regulation safety of an aircrafts flights: it is the State's might impact on operators of aircraft and other subjects 'objects of aviation through the adoption of regulations of varying legal effect (as well as authorization to the national legislation of regional and universal international agreements) for safe using aircrafts for the purpose of transportation within the state territory and the international airspace in order to achieve the objectives of the flight.

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N.V. Vdovenko (National Aviation University, Ukraine)

LEGAL REGULATION OF FLIGHT SAFETY: FEATURES OF LEGAL REGULATION

The question of legal regulation of flight safety is investigated on the basis of analysis of current legislation and international instruments.

The problem of civil aviation security existed since the first flight of aircraft. Significantly, the first legal act regulating the flight of aircraft is the decision of the Paris police on April 23, 1784, which dealt with security, licensing system of flight was introduced and some rules for fire safety balloons were established [1, p. 46]. Accordingly, the preservation of life and health is one of the most important principles of civil aviation. Universal Declaration of Human Rights and the Constitution of Ukraine in Part 1, Art. 3 declare that human life, health, immunity and safety are the highest social value [2], similar principles are fixed in current legislation on transport. Thus, according to Part 1, Art. 16 of the Law of Ukraine "On transport", transport companies must ensure the safety of life and health, operational safety of vehicles, the protection of the environment [3]. This principle is also enshrined in the concept of development of civil aviation of Ukraine [4]. In practice, it means, that the subjects of aviation can not justify the insufficient level of security of its great cost, loss-making security measures or deterioration of competitiveness of enterprises. So, the above follows that an aircraft that can not finance the providing of the proper level of civil aviation security, should not be allowed to aviation activities. But the principle is no doubt that certification requirements for aviation entities to provide security must be reasonable and adequate to degree of threat.

On the priority of the situation shows Decree of the President of Ukraine "On pressing measures to ensure aviation of Ukraine" which notes that: "The providing of aviation safety is the priority objective of government regulation of aviation activity" [5].

Thus, according to the Constitution of Ukraine and in accordance with the Decree of President of Ukraine "On public service of Ukraine for ensuring aviation safety oversight" (hereinafter - Decree) [6] and to improve state regulation of the use of airspace and air traffic services, the conditions for implementation the measures envisaged Air Code of Ukraine [7] for the ensuring safety of aircraft operations, aviation safety, quality work and services in this area was established Statel Service of Ukraine for ensuring aviation safety oversight.

It should be noted that the decree does not partly accord 94/56/YES Directive, such as Article 6 of Directive established that the agency engaged in investigation of aviation accidents, should be functionally independent, in particular from national authorities on aircraft, while State Aviation Service is included in the structure of the Ministry of infrastructure, and therefore is not independent as required by international legal legislation.

As with any phenomenon of objective reality, a system of flight safety management should be considered as a complex entity. So the first thing to start with the question of what aspects including to the concept of "flight safety" and that the components of security.

Flight safety can not be separated from the technical safety of the aircraft, qualifications and training of pilots, air traffic control, air traffic services, procedures and conditions of carriage of different types of cargo and baggage, factor AUI and the meteorological situation.

As you know the fundamental acts in the regulation of flight safety is: Convention on International Civil Aviation (Chicago, 1944; next - Chicago Convention), which provides the formation of the International Civil Aviation Organization (hereinafter - ICAO), which Ukraine joined in 1992, and Air Code of Ukraine, adopted in 2011 (hereinafter - PKU) with the following modifications [7, st.129].

Although the main principles of the Chicago Convention are relating to the establishment and activity ICAO, Article 37 of the Chicago Convention requires Contracting States to cooperate "in achieving the greatest possible uniformity of rules, routes and support services on all matters in branch which such uniformity will facilitate air navigation and improve it "and provides the

adoption and improvement of the ICAO international standards and recommended practices and procedures regarding: communication systems and auxiliary air navigation facilities, including ground signs; characteristics of airports and landing fields; laws on air traffic and practices of control air traffic; issuing certificates of pilots and maintenance personnel; suitability of aircraft to fly; registration and identification of aircraft; collection and exchange of metrological information; log books; aeronautical charts and tables; customs and immigration rules; aircraft in distress and investigation of accidents and other matters relating to safety, regularity and reliability of air navigation, the necessity that may arise from time to time.

Thus, according to Articles 54 and 90 of the Chicago Convention, the adoption of relevant international standards and recommended practices relates to the duties of the Council of ICAO, which formulates them for convenience in the Applications to the Chicago Convention and immediately notify all contracting States of taking action. The relevant application are accepting by majority of two-thirds votes of the session, which is convened for that purpose, and are entering into force within three months after sending Contracting State (or within any other longer period which is set by the Council), if only for this period the majority of contracting states to the Council do not declare its opposition to such applications.

Applications are binding for all contracting states, except those in accordance with article 38 of the Chicago Convention, reported ICAO on the correspondence between their own practices and practices that set international standards.

Currently there are 18 Applications to the Chicago Convention (including mandatory and for Ukraine).

Yet the Chicago Convention does not provide the formation of certain state control and administrative bodies, rightly leaving the institutional structure of flight safety management in the area of responsibility of a Contracting State.

According to Article 5 of the Air Code, entitled "State regulation of activities in the field of civil aviation", competent authority for civil aviation implement the national policy and strategy of development of aviation of Ukraine, performs state regulation of activities in the field of civil aviation in the following areas:

implementation of comprehensive measures to ensure flight safety, aviation, environmental, economic and information security;

creating conditions for development of aviation, air transportation and maintenance, performance of aviation operations and aircrafts flight general aviation;

organization of using of the airspace of Ukraine;

representation of Ukraine in the International Civil Aviation Organization and international relations in civil aviation.

These areas should be noted supervision for safety surveillance aircraft operations.

Article 10 "Aviation Safety" ACU suggests that in order to ensure the safety of civil aviation authority for civil aviation provides a set of measures designed to prevent aviation accidents by:

establishing criteria for aviation safety;

establishing the required level of aviation safety;

analyze and determine the existing level of aviation safety;

scheduled and unscheduled inspections, inspection of subjects and objects of aviation;

the timing and control over the subjects of aviation;

prohibition, revocation, suspension or change of any type of flight and aviation in the event of threats to the security of aircraft or their non-established standards and aviation regulations of Ukraine;

revocation, suspension of certificates, licenses, permits, restrictions on rights granted to these documents, cancellation of approval of candidates in accordance with paragraph ten of this article;

imposition of fines and other measures to ensure aviation safety.

Legal regulation of civil aviation is performing by taking in due course regulations and the adoption by the competent authority of civil aviation aviation regulations of Ukraine, regulating civil aviation and airspace use in Ukraine.

Aviation regulations define and regulate the procedure of aviation activities of Ukraine for ensuring the aviation safety and environmental safety.

Aviation regulations of Ukraine are developing in accordance with standards and recommended practices of the International Civil Aviation Organization regulations, of the International Association of Transport, the European Organisation for the Safety of Air Navigation (Eurocontrol), other international aviation acts and subject to EU legislation in the field of civil aviation.

Aviation regulations include regulations that govern the supervision and control of flight safety and order of measures to protect aviation against acts of unlawful interference in its activities.

There are also a number of regulations, intended purpose which is to regulate safety, including, and flight safety. Among them we should mention:

- State Program aviation safety of civil aviation;
- Procedure for making a decision on the departure from the rules for flying devices;
- Instructions for the transport of goods by air;
- Instructions on procedure to ensure aviation safety during air transport and works outside Ukraine;
- Rules for certification of aviation security services in Ukraine;
- The program of training of aviation security;
- The program of aviation security quality control subjects.

Thus, the flight safety management system consists of certain elements of the legal validity (international and national acts) connected and complementary.

The first one is connected with the desire of every sovereign state to enter on its territory a system of national air standards, which not only takes into account the specifics and level of development of civil aviation of the state, and most conducive to the creation of optimal conditions for its political, economic, scientific, technical and other interests. This trend, based on international legal principles of sovereign equality, territorial supremacy and independence, forces a State to introduce its rules on aviation safety.

But there is another trend that leads to the unification of various national aviation regulations and the creation of a unified system of international technical standards for civil aviation. The basis of this trend is the internationalization of economic life of modern society and technological progress, which encompasses and extends its influence on Civil Aviation.

Design and implementation in practice of many countries the uniform international law (which is standard ICAO), governing relations in the field of civil aviation is essential. Creating a unified system of technical aviation regulations promote safety of flight of civil aircraft on international routes as well as eliminates the need for pilots in different national rules.

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M.M. Antonenko (National Aviation University, Ukraine)

ACCESS MODE TO SPACE DATA AS ETHICAL PRINCIPLE OF SPACE ACTIVITIES

The article is devoted to the problem of determination of the mode of access to the different types of space data. The basic prospects of the international fixing of opening mechanism of information of space data are exposed, and also the basic possible forms of adopting principles are analyzed.

The 20th century observed a sharp jump in the development of technologies, including space technologies occupying a special place among them. For the first time ever in the history a man came out in the open space and got a great potential in the environment monitoring. The data being obtained from satellites contribute to improvements in various areas of life. Now the development of space technologies directly determines the level of economic and social development of states.

In addition to using space data for economic purposes, their use can significantly reduce the impact of natural disasters and emergencies, playing a significant part in the development of science. Though the data application is differentiated, at the moment there are no relevant legal access modes to the space information, depending on the intended use.

There is now a need to develop these terms of reference. Division of legal access modes to the space information was studied by a lot of foreign scholars, among whom the works of A. Pompidou, H. Harris, L. Yongxiang should be emphasized. O. Beglyi, professor, was among the native scholars, who developed the problem of ethical principles of the space activities.

For the first time considerable attention was paid to this issue in the development of ethical principles of the space activities by the Working Group on the Ethics of Outer Space, COMEST, in 1998 – 2002. Of course, the ethical principles of space activities ceased to be an option element and were used in a lot of agreements on various aspects of human life. As a result of COMEST work, it was suggested to continue the development of differentiated access modes to the space information aimed at their consolidation internationally as a part of the ethical principles of space activities.

The most useful way is to divide space data into three main types:

1) Scientific data
2) Ecological data
3) Commercial data

The purpose of scientific data usage is to determine the development of scientific level in the framework of research projects. Free exchange of such information will accelerate the scientific progress and perfect international scientific collaboration that will improve implementation of UNISPACE-III recommendations to enhance the role of space technologies in life improvement, especially in the fight against global challenges to the humanity.

Attention should be paid to establishing such a mechanism of access to scientific space data, which free access will have a special significance for developing countries. Due to the complexity of adaptation and development of space data by scholars of developing countries, creation of diversified scientific initiatives taking into account the needs of developing countries is necessary.

Ecological information is characterized by a certain peculiarity, which is directly related to the objectives of its use, including as follows:

- environmental protection;
- weather forecasting;
- prevention and control over consequences of emergencies and disasters.

Based on a high social value of such information, as well as the critical timing of its disclosure it is necessary to provide for immediate disclosure of environmental information in the event of an emergency.

The cases, when for the effective management of the consequences of emergencies one state needs to disclose information to another state for the needs of a third state should be also emphasized. It seems logical that such information should be also disclosed immediately and

without obtaining the consent of the state, the data on the territory of which are provided.

Moreover, it seems necessary to simplify the mode of data exchange for weather forecasting. Enhancement of international cooperation in this issue will contribute to the efficiency of weather events forecasting that must have positive economic consequences for all the countries worldwide.

As to the commercial information, it must be consolidated the priority to economic benefits in order to guarantee reimbursement for the expenses incurred while obtaining such information and developing space technologies. First and foremost, this includes the data records for the Earth's surface and the information associated with the use of communication technologies. This type of information should be provided only on the appropriate payment basis. The ideal organization for such a procedure of information selling is the one that will satisfy both the seller and the buyer of space data.

The issue of providing with commercial data on preferential terms for the developing countries is still open. Taking into account the level of economic development of such countries, their acquisition of space data at full cost turns to be impossible. One of the solutions to this situation is possibility of providing with free data obtained in the previous years, which have a relatively low resolution. Such data, being obsolete for the developed countries, can significantly stimulate economic and social development of the Third World countries.

Moreover, increase of educational space programs for the developing countries is necessary because provision with space information without proper training of specialists will not be significantly effective. In this case we have in mind not only training of specialists in the field of space technologies, but also educational programs of economic, mathematical and other areas that will provide with an opportunity to use the obtained information more effectively for the economic development of lagging countries.

The issue of access mode to space data requires its subsequent development. As to the possible forms of consolidating ethical principles of space activities associated with access to space data, the following options can be singled out:

1) Adoption of a separate international-and-legal document on ethical principles of space activities, in which one part will be devoted to the access mode to space data;

2) In the process of the development of international space law through the adoption of a comprehensive agreement on space activities, such as the UN Convention on the High Seas, to consolidate the ethical principles in a separate section of the agreement, which will include the principles of access to space data;

3) In the process of upgrading of the existing system of international agreements by specifying the existing regulations and consolidation of the rules regarding the outstanding issues within the existing agreements, it is reasonable to pay attention to the access mode to space information within one of the existing agreements.

Analyzing each of the identified options, advantages and disadvantages of each can be identified. Upgrading of the existing space agreements seems appropriate at the present stage of the international space law development. This way has the closest perspectives and, in the context of the principles of access to space information needs only to harmonize the states' positions as to their ethical principles content, and after that their consolidation at the level obligatory for the states is possible in a relatively short period of time.

The adoption of a separate international agreement dedicated to the ethical principles of space activity, compounded by the lack of agreement on the need for the positions of the fixing of ethical principles in the framework of an international treaty. Creating such a document are more difficult task, however, in contrast to the version of the modernization of existing agreements, it will have a greater effect and be under a more progressive aspirations.

As for the adoption of a comprehensive basic agreement on the international space law, it seems to be the most promising and appropriate. A lot of the existing international regulations dealing with space activities are obsolete and do not meet the new realities of space activities, primarily due to the commercialization and globalization of the international space activities. This option is the most radical and comprehensive way to overcome the problems, and certainly will lead

to more tangible results. However, due to the lack of the states' agreed positions on lots of issues that relate to international space law, the adoption of such an agreement must be preceded by a long international discussion of its future provisions. Therefore, the adoption of a comprehensive international agreement on the international space law is possible only in the long run. It should be taken as a strategic goal and focus on its achievement in the future.

Taking into account the above-mentioned, it may be noted that the adoption of the principles of access to space data is a topical issue that needs to be solved as quickly as possible. It is proposed consolidation of three different access modes to space data, which relate to commercial data, ecological data and scientific data.

The issue of access to different types of space data needs to be discussed subsequently on the international scientific and political level, as well as the issue of consolation of the ethical principles form on access to space data.

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N.M. Korchak,
Candidate of legal sciences, associate professor,
(National Aviation University, Ukraine)

ANTIMONOPOLISTIC REQUIREMENTS ABOUT ACTIVITY OF STRATEGIC ALLIANCE «UKRAINIAN AVIATION GROUP»

In materials of theses of a conference are examined the questions about expedience of association of resources of airlines on the whole and in particular are outlined antimonopolistic requirements about activity of strategic alliance «Ukrainian aviation group».

In a preamble to the Law of Ukraine «On protecting of economic competition» from 11.01.2001 is marked its direction. It is the effective functioning of economy of Ukraine on the basis of development of competition relations [1]. By such method a legislator formulated presumption of positive influence of contentionness between the subjects of menage on an economy on the whole. A competition is declared as a fundamental factor of economic development. is selected. Between the special principles of air law exudes the principle of «open-skies». On its basis a right of the use of air space of the state is fixed for realization of international air shipments by the subjects of air legal relationships, which are registered on territory of other states [2, p. 16].

With the purpose of decision of questions which are related to providing of competitiveness on internal and external markets ferrymen try to coordinate the efforts by creation of alliances of airlines. And as right marked Z.V. Mokrinska, any airline competes not only with separate ferrymen out of alliance but also it competes with alliance on the whole, with all its network, financial and production power [3, p. 76].

Strategic alliance «Ukrainian aviation group» was founded at the beginning of 2007 by the Ukrainian airferryman the «Aeroworld» which was created in 1994 yet and by the third after size airline Ukraine «Donbasaero». Its rout network includes over 70 regular open-wires to 32 countries of the world. An alliance agreement between the noted airlines was supported by Ministry of transport and connection, State administration of Ukraine, Fund of national property which presents the state in composition of the shareholders of the «Aeroworld» and also concertedly with the Antimonopolistic committee of Ukraine. In fact in accordance with st. 10 of the Law of Ukraine «About defence of economic competition» can be settled the separate concerted actions of menage subjects by the Antimonopoly committee of Ukraine or Cabinet Ukraine at terms if such actions have by the result perfection of production, acquisition or realization of commodity; technical-technological, economic development; development of small or middle businessmen; optimization of export or import of commodities; development and application of compatible technical conditions or standards on commodities; rationalization of production.

As a result of deep research of situation on the markets of air traffics gave the Antimonopolistic committee of Ukraine permission on making alteration in the concerted actions as a conclusion of the Additional treaty from December, 30, 2009 between «Aeroworld» and «Airline of «Donbasaero» as entering into it of «Dniproavia» which was created in 1931 yet. Granted permission is given for a term on one year (to December, 1, 2011) with imposition of obligations on the participants of the noted concerted actions. In accordance with an agreement about Strategic Alliance of airline plan to unite a technological, production and commercial resource. In particular, is foreseen formation of general network of routes, association of parks of air ships and scheduling general flights within the framework of agreement [4, p. 61].

Taken participants of alliance obligations conditioned foremost with the necessity of formation of just prices on internal air traffics and the association of resources which is dictated by the necessity of creation of favourable terms for its participants to compete with foreign airlines which will be able to go out to the market on condition of tacking of Ukraine to Agreement «About open-skies».

Nowadays activity of alliance «Ukrainian aviation group» is under intent Antimonopolistic control. As reported a press-centre of the Antimonopolistic committee of Ukraine from 22.09.2011 «Aviation company «Dniproavia» was the unique airferryman after routes «Kyiv – Dnipropetrovsk – Kyiv», «Kyiv – Ivano-Frankivsk – Kyiv», «Kyiv –Lugansk – Kyiv», «Kyiv – Lviv – Kyiv», «Kyiv – Odesa – Kyiv», «Kyiv – Sevastopol – Kyiv», «Kyiv – Uzhgorod – Kyiv», «Kyiv – Kharkiv – Kyiv» and «Kyiv – Tchernivtsi – Kyiv» in a period of flying navigation of IATA «Winter 2010-2011». According to prices on the airline tickets of which in 1,3-1,7 times were higher than tariffs on the air freight of passengers after a route «Kyiv-Simferopol-Kyiv» on which in an indicated period worked four airlines and was a competition. Cost of transportations of «Airline «Aeroworld» after a route «Kyiv – Donetsk – Kyiv» exceeded in general the tariffs of PRAT «International airlines of Ukraine» on an air freight after an analogical route. In particular maximal tariffs in the «economic class» are higher in 1,7 times and minimum tariffs in «business-class» are higher in 1,8 times. Seeing in such actions the signs of violation of competition legislation, the Antimonopoly committee of country obliged «Aviation company «Dniproavia» and «Airline «Aeroworld» to bring the tariffs on services in carrying passengers on regular internal routes to the level which would exist at the terms of considerable competition at the proper market. In same queue the authorized representative of «Airline «AEROWORLD» who was present on the meeting of Committee reported about the decline of tariffs on separate air traffics and readiness of subsequent price-cutting on airline tickets especially on condition of the planned decline of tariffs on aeroport services.

Conclusions

Taking into account marked by us higher it is possible to draw conclusion that creation of alliances of airlines can take place both within the limits of air space of separate country and at the international market of air transportations. In same queue the unique alliance «Ukrainian aviation group» is a system of balanced, mutually beneficial partner relations and mutual obligations of airlines and foresees an association on the principles of competition legislation with the purpose of development of Ukrainian market of air transportations on the way of signing of Agreement about open-skies.

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N.V. Filyk, Candidate of legal sciences,
O.V. Zubrytska, Senior lecturer
(National Aviation University, Ukraine)

ASPECTS OF INTELLECTUAL PROPERTY RIGHT IN THE AVIATION FIELD

The article deals with certain aspects of legal protection of intellectual property objects in the aviation field. The authors analyze some peculiarities of legal protection of industrial property objects, in particular inventions and utility models.

In recent years the accent of social and economic development of the countries all over the world has moved from production to intellectual activities. The experience of the developed countries shows steady and purposeful tendency to the priority of such social activities as science, technique, culture, creative work. The new priorities of social activities require due legal protection of all types of creative work. Therefore, at the end of the last century many countries started to renew intellectual property legislation, especially the laws concerning its legal protection. The new laws on intellectual property protection were adopted and international organizations revived their activities relating to legal protection of creative results in many countries.

Nowadays the interest to technical creative activities in the aviation field has dramatically grown. In this article we analyze in detail certain aspects of legal protection of intellectual property objects in accordance with the effective legislation of Ukraine.

Modern production requires new scientific and technical progress, numerous up-to-date solutions from our researchers. New goods and production means play a very important role in the renovation and replacement of outdated manufacturing technologies and, in that way, are the most effective means of using the industrial branches of economy.

Industrial property is one of the components of intellectual property. Industrial property is the result of scientific and technical creation which may be used for the benefit of society in any sphere of human activities.

Industrial property rights are subjective rights to the various results of intellectual creation – technical and untechnical which are given special legal protection because of their great importance in the field of economic activity, production and trade.

Industrial property objects are engineering solutions which are used in production: inventions and know-how, industrial and aesthetic solutions known as industrial designs.

Industrial property right is the institution of civil law that regulates relations connected with technical creation. Unlike copyright industrial property right is realized in the other sphere of creative work dealing with natural laws of the material world. They do not reveal the individuality of their creators as copyright objects do. That is why objects of technical creation are reproducible. They may be created separately, by different persons, so they must be officially registered. Moreover, the results of technical creation are intended to solve practical tasks and have practical significance.

In the scientific literature there are two approaches to the industrial property objects: wide and narrow.

Paris convention for the protection of industrial property of the 6 of March 1883 includes the following objects of the industrial property: inventions, industrial models, trade marks, commercial (brand) and geographical names and also repression of unfair competition.

Ukrainian researchers refer to the objects of industrial property only those specified by the current legislation: inventions, useful and industrial models, topography of integrated circuit, rationalization proposals, species of plants, breeds of animals, commercial and geographical names, trade marks (for goods and services), commercial secrets, scientific discoveries.

Patent law objects which are the results of technical creation are essential in the group of the industrial property objects. They include inventions, utility models and industrial designs. First of

all patent legislation must promote the development of scientific and technical creation and use its achievement in the national economy of Ukraine. Patent legislation is formed actively as such form of protection of creative results meets the requirements of market economy, though it is not perfect.

The second group of industrial property objects includes the means of individualization of goods and services: trade marks, commercial and geographical names.

The other group includes non-traditional objects of intellectual property. They are: commercial secrets, rationalization proposals, arrangement of integrated circuit, species of plants, breeds of animals, scientific discoveries.

Industrial property is one of the components of intellectual property. Industrial property is the result of scientific and technical creation which may be used for the benefit of society in any sphere of human activities.

Industrial property rights are subjective rights to the various results of intellectual creation – technical and non-technical which are given special legal protection because of their great importance in the field of economic activity, production and trade.

Industrial property objects are engineering solutions which are used in production: inventions and know-how, industrial and aesthetic solutions known as industrial designs.

The most common industrial property objects on aviation field are inventions and utility models.

It is significant that registration of industrial property objects is of great importance: the exclusive right belonging to the creator of the certain intellectual product or another authorized person is not recognized without registration and obtaining special certificate. Regardless of the title of protection – patent or certificate – it is an individual act of the authorized state authority that certifies the priority, exclusive rights of its owner, sometimes determines the authorship and qualifies the result of intellectual activities (e.g. patent for invention).The term of validity and legal protection of relevant subjective rights on the part of the state is limited. The term of legal protection is limited for such objects as inventions (20 years), utility models (10 years), topographies of integrated circuits (10 years). For other objects of industrial property there is an opportunity of prolongation of above-mentioned document in case of payment to keep the protection document in force (the term of validity of the patent for industrial designs is 10 years with the opportunity of its prolongation).

Registration procedure is not obligatory for all objects of industrial property. In particular, the legislation does not require any obligatory procedures for legal protection of commercial (firm) names.

The subjects of industrial property right are the patentees and other persons who gained these rights according to the contract or law.

Under the Civil code of Ukraine the subjects of patent law are an inventor, an author of the industrial design and other persons who gained the rights to these objects according to the contract or law.

An inventor is an expert in the technical sphere who created the invention or is the author of the utility model.

An author of the industrial design is a natural person whose creative work resulted in this work.

Article 12 of the Law of Ukraine “On protection of rights to inventions and utility models” says: “a person who wants to acquire a patent and is entitled to it should file an application to the Agency”. If a person who wants to acquire a patent is legally incapacitated an application is filed by his representatives in the name of this person.

Only the State department of intellectual property may be an examiner of applications for industrial property objects. The State department of intellectual property represented by the State enterprise “Institution of industrial property” is the only state authority which examines applications for industrial property objects.

Patent attorney is another participant of legal relationships in the sphere of industrial property right. Patent attorney is an expert whose duties are to act on behalf of natural or legal persons: to

file applications and obtain titles of protection for industrial property objects in our country and abroad, represent their interests in the patent offices, courts etc. Legal status of these persons is regulated by the Provisions on representatives dealing with intellectual property cases (patent attorneys), Provisions on the state registration of representatives dealing with intellectual property cases (patent attorneys), Provisions on the State patent commission for certification of representatives dealing with intellectual property cases (patent attorneys), Provisions on the Board of Appeals of the State Patent of Ukraine.

Patent attorneys deal with all issues in the sphere of industrial property allowed by legislation.

The objects of industrial property are protected by multilateral system of international legal protection of industrial property. The system of international legal protection of industrial property includes international legal acts and activities of international organizations.

According to the Law of Ukraine "On the protection of rights to inventions and utility models" any person has the right to patent an invention (utility model) in foreign countries. Before submitting an application for obtaining the title of protection for the invention (utility model) to the Department of a foreign country an applicant must submit an application to the Public enterprise "Ukrainian institute of industrial property". At the same time he must inform the State Department of intellectual property about his intentions to patent an invention (utility model) in foreign countries.

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V.M. Bilousov, Senior lecturer,
O.V. Zubrytska, Senior lecturer
(National Aviation University, Ukraine)

LEGAL REGULATION OF AIR TRANSPORTATION OF PASSANGERS AND CARGO IN UKRAINE

The article deals with the issues concerning legal regulation of air transportation of passengers and cargo in Ukraine, in particular: legal status of participants of aircraft operations, terms and conditions of the contracts of air transportation and liability of the subjects of air transportation.

Air transportation of passengers and cargo in Ukraine is regulated by the Civil Code of Ukraine as of January 16, 2003, Economic Code of Ukraine as of January 16, 2003, Air Code of Ukraine as of May, 19, 2011, and the Law of Ukraine "On liability of carriers during international passenger operations" as of December, 2, 2010, the Order of the Ministry of transport and communications of Ukraine № 216 of April, 23, 2010 "On approval of the Rules of air transportation of passengers and cargo in Ukraine" (registered in the Ministry of Justice of Ukraine 11.09.2010 № 669/17964), other normative acts and general provisions on the rules of transportation and rendering services. Ukraine is an active participant of international community and applies the norms of various international transport agreements and conventions which are of great importance for international transport operations and unification of Ukrainian transport legislation, in particular: the Convention for unification of certain rules relating to international carriage by air (Montreal, May, 28, 1999, effective in Ukraine since May, 6, 2009), Warsaw Convention, signed in October, 12, 1929, effective in Ukraine since November, 14, 1959) and additional conventions and protocols.

In accordance with the legislation of Ukraine, the subjects of legal relationships are an air carrier and a passenger.

Air carrier is a business entity that provides services connected with air transportation of passengers, cargo, mail, carries passengers and (or) cargo for payment and (or) for hire, has a license of air transportation of passengers and (or) cargo, and a relevant document permitting to operate a particular air line issued by an authorized body of civil aviation in accordance with legislation of Ukraine. (clause 8, article 1, clause 1, 3, article 92 of the Air Code of Ukraine). Foreign air carrier may provide services connected with air transportation into and out of Ukraine, within the territory of Ukraine, landing in the territory of Ukraine with commercial purpose, provided that the relevant license and certificate issued by an authorized body are available (article 95 of the Air Code of Ukraine).

Passenger is a natural person being carried by aircraft with consent of air carrier in accordance with the contract of air transportation, except crew members and other specialists on board the aircraft, workers of the aircraft operator, authorized representative of the relevant national regulating authority and persons accompanying cargo (clause 75, article 1 of the Air Code of Ukraine).

Legislation specifies other participants of legal relationships connected with air transportation: airline and aircraft operator. Airline is a business entity that provides services connected with air transportation of passengers, cargo, mail (clause 8, article 1 of the Air Code of Ukraine). Aircraft operator is a legal or natural person that operates or offers services of aircraft operation (clause 36, article 1 of the Air Code of Ukraine).

Air transportation services are provided on the ground of the contract, general provisions of which are specified in the article 64 of the Civil Coda of Ukraine. Under the contract of air transportation one part (the air carrier) is obliged to carry another part (the passenger) to the destination point, in case of checking in luggage the air carrier is obliged to deliver it to the destination point and give out to the person who has the right to claim luggage; the passenger is

obliged to pay the relevant fare, in case of checking in luggage the passenger is obliged to pay for its carriage (part 1, article 910 of the Civil Code of Ukraine).

The above-mentioned contract is bilateral, i.e. both parts have rights and obligations. In particular, the air carrier undertakes to carry passenger to the destination points, and the passenger undertakes to pay the relevant fare. The passenger has the right to refuse air transportation and to get payment back in accordance with the procedure established by legislation of Ukraine. Refuse of air carrier is a refuse to carry the passenger or his luggage, except the cases specified by the Air Code of Ukraine, in particular: health care, protection, undue registration of documentation (passport, visa, ticket etc).

In case of breach by the parties of their obligations under the contract of air transportation they incur civil liability specified by the contract unless otherwise established by the Civil Code of Ukraine, other laws, transport codes (statutes).

Breach of the terms of the contract leads to liability of the air carrier:

1) civil law acts contain the list of violations resulting in liability of air carrier;
2) civil laws provide for limited liability for loss, shortage or damage of cargo (luggage);
3) the Air Code of Ukraine specifies the grounds for exemption of air carrier from liability.

Violations of the contract of air transportation resulting in liability of air carrier include:

1) failure to provide transport facility;
2) delay in departure of passenger and failure to deliver passenger to the destination point in time;
3) delay in cargo (luggage) delivery;
4) loss, shortage or damage of cargo (luggage).

In accordance with the article 924 of the Civil code of Ukraine the air carrier incurs limited liability for loss, shortage or damage of cargo, luggage, mail at the amount of accrued loss unless the latter proves that loss, shortage or damage occurred not through its fault. However, such limitation does not provide for possibility to claim loss of profit, so, in our opinion, full liability of air carrier should be compulsory.

Air carrier must take all necessary measures to avoid delay in transportation of passengers and luggage. In case of force-majeur circumstances, in particular: adverse weather conditions, case of emergency, strikes, riots, civil disturbance, embargo, acts of hostility, nuisance, unsettled international relationships, technical problems or other hardships that threaten flight safety or make the flight impossible, the air carrier has the right to cancel or delay the flight, or to cancel reservation without notifying the passenger.

The air carrier is exempted from liability for delay if delay in transportation of passenger does not exceed permissible terms or delay is caused by force-majeur circumstances.

The rules of air transportation of passengers and luggage specify that the passenger is fully responsible for obtaining all necessary travel documents: visas, permits etc., as well as for complying with all applicable laws relating to entry, exit and transit of the country. The air carrier does not incur liability for failure by the passenger to obtain such documents, visa, or to comply with such applicable laws. At the request of the air carrier the passenger must produce to authorized persons of the air carrier, agents of relevant government authorities all entry, exit or transit documents, due health certificates and other documents required by applicable laws, and allow the air carrier to make and keep copies of such documents. The air carrier has the right to refuse transportation if the passenger fails to comply with applicable laws or duly register the documents (i.e. absence of visa, funds, return ticket etc.).

Much attention is paid to the rule according to which the air carrier is not responsible for losses resulted from failure to comply with applicable laws by the passenger. For instance, if the passenger does not have entry visa to the country or other permits it is impossible to accommodate the passenger at the hotel at the expense of the air carrier if there is no hotel at the airport, since leaving the territory of an airport without visa is considered as violation of international immigration law. Thus, airline is not responsible for losses resulted from absence of visa.

The passenger is entitled to compensation from the air carrier in case of failure to carry,

cancellation or long delay of the flight in accordance with the procedure established by the Civil Code of Ukraine, Air Code of Ukraine, aviation rules of Ukraine and international treaties.

Thus, air transportation of passengers and luggage in Ukraine is regulated by the contract of air transportation, general provisions of liability law of the Civil Code of Ukraine (chapters 47-53), special norms (chapter 64 "Transportation"), Warsaw and Montreal conventions that prevail over domestic laws.

The Civil Code of Ukraine and the Air Code of Ukraine contain general provisions concerning liability of the air carrier. Although such liability is clearly regulated by provisions of international conventions and treaties ratified by Ukraine, it is necessary to bring the norms of domestic civil laws to conformity with the provisions of above-mentioned international legal acts.

Although legal regulation of the contract of air transportation of passengers and luggage needs further theoretical and practical analysis, adoption of a new version of the Air Code of Ukraine by Verkhovna Rada is an important step for Ukraine for the development of air transportation service in general, and, in particular, transportation of passengers and luggage.

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A.O. Gelich, candidate of legal sciences, senior teacher,
(National Aviation University, Ukraine)

PROBLEMS OF DETERMINATION OF THE CONCEPT «SAFETY OF CIVIL AVIATION»

The problem questions of determination of concept «safety of civil aviation» are lighted up in materials of theses of a conference.

Safety of civil aviation is the constituent of safety of transport, which is in same queue the constituent of national safety of Ukraine coming from determination of the last as protected vitally important interests of man and citizen, society and state which is contained in st. 1 Law of Ukraine «About bases of national safety of Ukraine» [1]. Such assertion fully conforms to those determinations of national safety which are given in a legal doctrine [2, p. 783; 3, p. 676]. In fact a general purpose (national safety) can not be attained without providing of safety of civil aviation and safety of transport on the whole. For this reason it is necessary foremost to stop for finding out of essence of term «safety» examining safety of civil aviation.

Thus, under safety understand the «state when something threatens» [4, p. 115] anything or «absence of danger, safety, reliability» [5, p. 167] and also «position when a danger threatens to someone, something» [6, p. 38], «state of protection» [7, p. 207]. Normative sources determine a term «safety» as «absence of impermissible risk which is related to possibility of task of any harm» [8, p. 3]. In opinion of scientists safety shows the aggregate of mediated by the sources of enhanceable danger of relations which are regulated by the legal, technical and organizational norms with the purpose of prevention and removal of threat life and health of people, financial values and external environment [9, p. 21].

Concept «safety» means «absence of danger», absence of some threats according to etymology of this word. Dangerous and safe are the states, opposite to each other. To another oppinion danger is understood by the state of threat, possibility of damnification, hoodoo to anybody, anything [6, p.338]. Under threat is understood «possibility or inevitability of origin of something dangerous, annoying. That which can cause some evil, trouble» [4, p. 15]. Safety and threat of damnification are concepts similar by value.

According to a concept «safety of civil aviation»,its legal determination is contained in the Air code of Ukraine [10], in particular in st. 1. It is marked that safety of aviation is the state of industry of civil aviation for which the risk of losses task for people or property goes down to the acceptable level as a result of continuous process of determination of danger's level and management by it and contained at such level or goes down farther in the spheres of flights safety, aviation safety, guard of natural environment, economic security and informative safety.

However unlike a national legislation the analysis of legal literature gives grounds to assert about absence of attempts to give the scientifically grounded determination to a concept «safety of civil aviation» and also its constituents. Such attempts were done only in scientific and technical literature. Thus, is the opinion of A. V. Filippov [11] which is fully legitimate. There is an interpretation of safety of aviation which is offered by V. P. Babak and his coauthors: «complex property of an aviation transport system to execute the functions without the task of losses (whether with minimum losses) to the system or population in interests of which it develops» [12, p. 17].

Also we need to pay regard that next to a term «safety of aviation» is a term «aviation safety» which is used in st. 1 of the Air code of Ukraine [10]. It is determined as «protecting of civil aviation from the acts of illegal interference which is provided by the complex of measures with bringing in of human and financial capitals». We need to mark that the concepts «safety of aviation» and «aviation safety» are not equal on a volume and they nowise can not be equated.

Conclusions

Thus, coming from the analysis of current legislation the concept «safety of civil aviation» means the state of normal and safe activity of aviation and aviation objects for which dangerous

factors are controlled in international and national legal acts on certain, preliminary certain level.

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Kh.V. Kmetyk, Cand. Sc, Assistant Professor,
N.V. Trotsyuk, Assistant,
(National Aviation University, Ukraine)

SPECIFICS OF LEGAL REGULATION OF THE CIVIL RESPONSIBILITITY OF AIR CARRIERS: INTERNATIONAL-LEGAL ASPECT

In this article authors examines the specifics of legal regulation of the civil responsibility of air carriers, especially in the international legal sphere.

Air transportation is one of the most dangerous areas of the human activity. High risks and considerable extent of damages caused by these activities make lawyers of the whole world more and more often attend to legal analysis of the mechanism of civil liability of air carriers (airlines).

Liability of the air carriers (airlines) is one of major and most acute problems of the international air law. In this case one can speak of collision of commercial and financial interests of shipment companies, cargo owners and passengers. Therefore this question is in the focus of international conferences of all levels and is the subject of both theory and practice.

Main international-legal acts which govern order and limits of responsibility of air carrier are the Warsaw Convention [1], the Hague Protocol, the Guadalajara Convention, the Guatemala Protocol and the Montreal Convention [2].

Let`s analyze the order, grounds and limits of responsibility of air carrier under the Warsaw and Montreal Conventions.

The issue of airlines responsibility for causing injuries to passengers and damaging luggage along with delays in their carriage, which presents the main problems with regards to responsibility, is settled in the Warsaw Convention which was adopted in Warsaw on October 12th, 1929 and signed by 31 countries. This international act contains a number of general provisions as well as important practical instructions in this area. According to Art. 17-19 of the Warsaw Convention air carrier is liable for:

- ✓ any accident in which a passenger suffers death or injury if the accident occurs on board an aircraft or in the process of the passenger`s embarking or disembarking;
- ✓ damage sustained in the event of the destruction, loss or damage of any registered luggage or goods;
- ✓ damage occasioned by delay in the carriage by air of passengers, luggage or goods. [1].

The principle of air carrier responsibility for caused damages is rather clearly defined in the Warsaw Convention. According to Art. 20 the carrier is released from liability if he proves that he has taken all necessary measures to avoid the damage or that it was impossible for him to take such measures.

Thus, the air carrier liability in the Warsaw Convention is based on fault/ guilt; besides the burden of proof of its absence is laid upon carrier. These important provisions are clearly expressed in the text of the Convention and are generally accepted [3, p. 104]. Moreover, particularly stipulated is one of the most common situations which happen in practice that eliminates blame of the carrier – presence of the injured person`s guilt. According to Art. 21 of the Warsaw Convention the carrier is partially or wholly exempt from liability if he proves that the damage was caused by or contributed to by the negligence of the injured person and the Court considering the issue admit it possible to use in this case provisions of its own internal law [1].

Foreign courts in their decisions usually come from the fact that referring to use of the necessary measures of the general character by the carrier is not enough him to prove his innocence (and therefore not be liable). The carrier shall prove the existence of certain circumstance, which led to his failure to fulfill the air transportation contract, and cannot be treated as his guilt. In case of unclear reasons which led to violation of air transportation contract the air carrier is adjudged guilty under general rule and shall be liable for it.

It is considred that the rules of the Warsaw Convention of guilt as a condition of air carrier`s liability refer only to carriage of passengers, cargo and baggage, but not to hand luggage (unchecked baggage) that remains with the passenger. Concerning hand luggage only limit of the carrier's liability is foreseen. Therefore, the conditions of carrier`s liability at non-preserving of hand luggage shall be determined in accordance with the provisions of internal law that is applicable to contracts of international carriage.

Limit of the carrier`s liability defined by the Warsaw Convention is as follows: 125,000 francs per each passenger, 250 francs per kilogram of goods and luggage and 5,000 francs per hand baggage of each passenger (Art. 22). According to the Hague Protocol the first of these limits was doubled and amounted to 250,000 francs.

The above limits shall apply to damage caused to a passenger, luggage, hand baggage and cargo as well as to delay in their shipment. Above this limit the court in accordance with its national law can adjudge the plaintiff the compensation for all or the part of the incurred court charges. In case of non-preserving goods and luggage consigned with registered value the carrier will be liable to pay a sum not exceeding the declared sum, unless he proves that the interest of a passenger (cargo owner) is greater than the actual value.

The above standards of air carriers` liability were actually valid till enactment of the Hague Protocol on September 23th, 1955 on amendment to the Warsaw Convention. Signed by 27 countries, this Protocol changed and amended provisions of the Warsaw Convention of 1929. The changes were brought about not only by technological progress in civil aviation but also by change in economic factors and organizational forms of international air traffic. These are issues of the Protocol which amended the concept of international air transportation and entered a number of changes in processing shipping documents at air carriage.

Another innovative step in amending the Warsaw Convention was signing of the Guadalajara Convention on September 18th, 1961, additional to the Warsaw Convention for setting some rules concerning international air transportation performed by a person not being an air carrier under the contract. The main objective of the latter is the separation of air carrier: a) the contracting carrier, and b) the actual carrier. Also, this convention envisaged joint responsibility of the contract and the actual carrier to passengers and shippers [4].

It is worthwhile mentioning that Warsaw Convention, Hague Protocol, Guadalajara Convention form the basis of the so-called `Warsaw System` air carrier liability.

Afterwards, rather `severe competition` on the international air transport market pushed new revision of conventional standards of institute of the air carrier responsibility. Most important from legal point of view was retreat from the principle of guilt as a necessary requirement for the liability of airlines under air carriage contract.

Thus, the Guatemala Protocol, signed at the international conference in Guatemala on March 8th, 1971, envisaged increase of limits of liability: a) objective liability of air carrier for damage caused to a passenger (except for cases when damage is caused by passenger`s health or his guilt – up to 1.5 million gold francs (or roughly $ 100,000), b) limit of liability of air carriers for the delay in air traffic at presence of air carrier`s fault was set at the level of 15.000 francs per passenger.

Further, "Warsaw System" air carrier liability has been updated by amendments entered by the Montreal Protocol № 1-4, adopted at the diplomatic conference in Montreal in 1975 [4].

Subsequently, due to necessity of updating the extensive Warsaw System (Convention with Annexes: Hague Protocol, Guatemala Protocol) and to secure standards of air carriers liability that meet the requirements of modern aviation the new agreement which became effective on November 4th, 2003 – the Montreal Convention – was signed at the ICAO on May 28th, 1999. Parties to this Convention are 86 countries, including Ukraine [5].

The Montreal Convention became valid for Ukraine on May 6th, 2009 under the Law of Ukraine `On Ukraine's Accession to the Convention for the Unification of Certain Rules for International Carriage by Air` of 17.12.2008. The main feature of the Montreal Convention is absence of the limit of liability of air carrier; it aims to protect individuals in case of air accidents.

The Montreal Convention of 1999 was the result of continuous work on improvement of both

the mechanism of carrier`s responsibility and on the issue of unification and consolidation of all valid documents of the Warsaw System. It is worthwhile considering in detail provisions of the Montreal Convention regarding liability of air carriers in comparison with the Warsaw Convention.

In accordance with the provisions of the Montreal Convention a new principle of compensation was introduced, under which compensation for damages amounts to 100,000 Special Drawing Rights (1 SDR established by the International Monetary Fund corresponds to $13.7) per passenger. For comparison, the maximum amount that can be obtained for damage to life or health of a passenger under the Warsaw Convention is 250,000 francs (about $20,000), unless under the consent of a passenger and air carrier the transportation agreement sets a higher amount (amounts stated in francs in the Warsaw Convention of 1929 are converted into currency value and amount to 65.5 mg of gold at the standard of fineness of nine hundred thousandths) and under a court`s decision. Under the Montreal Convention the court`s decision is not required where the damage does not exceed 100,000 SDR.

The Montreal Convention also sets the new limits the carrier's liability for delay of aircraft and for damages caused during transportation. The delay may result in the loss of 4150 SDR (about $5000) to the carrier.

The Montreal Convention entered changes into solving the problem of the carrier`s liability for destruction, loss, damage or delay of baggage [5]. According to paragraph 2 of Art. 17 of the Montreal Convention the carrier is liable for damage sustained in case of destruction, loss or damage of checked baggage only provided that the event which caused the destruction, loss or damage took place on board an aircraft or during any period within which the checked baggage was in the charge of the carrier. However, the carrier is not liable if the damage resulted from the inherent defect, quality or vice of the baggage. In the case of unchecked baggage, including personal items, the carrier is liable if the damage resulted from the fault of its servants or agents.

Thus, the Convention divides the entire luggage into two categories: registered and unregistered. The carrier`s liability will depend on the category of damaged baggage. With regard to checked baggage the Convention establishes absolute carrier`s liability, since it occurs in any case, regardless of his fault, unless the damage occurs as a result of the defect, deficiency or quality of the luggage, or when the negligence or fault action or inaction of the passenger caused or contributed to damage of baggage. However, the liability system for unchecked baggage is completely different. This system can be described as subjective, because the carrier`s liability will depend directly on presence of guilt of the carrier`s agents or servants [6, p. 84]. Regarding setting the limits of carrier`s liability for loss, damage or destruction of baggage, the limit of the carrier`s liability changed from 250 francs (about $ 20) per kilogram under the Warsaw Convention to 1.000 SDR per passenger under the Montreal Convention.

The Montreal Convention has also extended protection of passengers and in addition to four options of jurisdiction established by the Warsaw Convention (at domicile of the carrier, at its principal place of business, at a place of business through which the contract has been made or at the place of cargo destination), added the fifth option, which allows victims to sue the responsibility of the carrier at the place of their residence [5].

Another indisputable advantage of the Montreal Convention is that it introduces two-level system of compensation. The first level - an objective responsibility in the amount of 100,000 SDR regardless of the fault of the carrier. The second level is based on the presumption of guilt of the carrier, which implies no limitation of liability at all.

Summarizing the above we can conclude that the Warsaw Convention governs various types of civil liability: tricky liability for damage to life and health of passengers, because such liability arises from breach of absolute subjective rights; contractual liability for loss, damage and delay of baggage and cargo, since it arises due to improper fulfillment of the contract of carriage [7, p. 76]. Contrary to the Warsaw Convention the Montreal Convention is very progressive in terms of the provisions on civil liability of air carriers. However, till now it has not solved the problem of multiple liability schemes established by the documents of the Warsaw System. In order to make the mechanisms defined in the Montreal Convention work, it is necessary that as many countries as

possible joine it and refused from the documents of the Warsaw System. However, not all countries are willing to join it because of too high, to their mind, limits of liability and continue to use the Warsaw Convention, the Hague Protocol, Guatemala Protocol. That is, the problem of multiple schemes of liability of air carriers remains unsolved till today.

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V.P. Kozireva, candidate of legal sciences, associate professor,
(National Aviation University, Ukraine)

LEGAL METHODS OF PROCEEDING IN SOLVENCY OF AVIATION ENTERPRISE

The legal methods of proceeding in solvency of aviation enterprise are examined in the materials of theses of a conference.

Every modern state aims to provide stability of economic development and firmness of the economic system. Aspiring the indicated aims to achievement the state lines up the concrete model of economic infrastructure. For today one of key elements of economic infrastructure of the state is a legislation about insolvency (bankruptcy) which is the legal form of expression of certain economic processes which flow in the state on the stage of development of public relations. Passing to the new terms of menage in Ukraine brought many aviation enterprises over to bankruptcy and some of them put on the verge of bankruptcy. Experience of other countries with the developed market economy testifies that destruction even one separately taken subject of economic activity brings negative consequences not only for it and its creditors but also for all society on the whole. In connection with it every state aims to create such system of facilities of warning of bankruptcy which would be directed on non-admission of confession of debtor a bankrupt in the case of presence of signs of possibility of debtor.

Warning of bankruptcy is legal methods proceedings in solvency which have signs of possibility taking away directed on non-admission by the economic court of decision about confession of debtor by a bankrupt and opening of liquidating procedure. One of facilities of warning of bankruptcy is sanitation of aviation enterprise.

By the plan of sanitation it can be foreseen such groups of measures on proceeding in solvency of aviation enterprise. They are measures of the operating restructuring and measures of the financial restructuring.

To the first group of measures belong measures of organizationally technical character. They touch the leadthrough of repair, technical modernization and expansion of material and technical base, realization of organizational actions in relation to optimization and perfection of its work. Taking into account a cost and duration of these measures, it follows to acknowledge that their realization has long-term character and can not make off and give a perceptible positive effect in terms, statutory Ukraine "About proceeding in solvency of debtor or confession it bankrupt" [1] for the leadthrough of procedure of judicial sanitation. This Law assumes extending procedure of sanitation only to 18 months. Such term is insufficient for realization of the noted measures but without their embodiment it is impossible to talk about proceeding in stable solvency of aviation enterprise on long duration prospect. On this account it is possible to foresee only beginning of realization of the noted measures in the period of procedure of sanitation by the plan of sanitation.

List of measures of the operating restructuring which is foreseen by this plan of sanitation is not all. In the process of realization of the program of modernization of enterprise there can be a requirement in embodiment of others which are not foreseen by the plan of sanitation of measures. The sequence of realization of measures of the operating restructuring can change depending on financial, technical, organizational, market or other factors and circumstances which are instrumental in more early or more late realization of that or other measure.

To the group of measures of the financial restructuring are attributed measures which are directed on bringing in of money of investors for financing of the operating restructuring and also on restructuring of debt enterprises before creditors, the requirements of which are included to the register of requirements of creditors. Such measures will allow on results procedure of sanitation delivered from overdue debts to halt realization in business about bankruptcy and to pass to functioning of aviation enterprise in the ordinary legal mode.

Except of the use of measures on proceeding in solvency which are foreseen by the plan of

sanitation during procedure of sanitation managing sanitation provides stable current economic activity of enterprise for what he must accept all necessary measures and provide their financing due to the money of enterprise or adopted money (bank credits and others like that).

In subsequent activity of aviation enterprise is enlargement of airferrymen with the purpose of scope as possible of more wide spectrum of various open-wires that allows to diversify risks and financial streams.

The most expedient on conditions that folded is the use of measures in direction of expansion and update of material and technical base of aviation enterprise for strengthening of it market positions and subsequent improvement of financial position.

Conclusions

Consequently, measures of the operating restructuring connected with repair and update of basic productive assets of aviation enterprise and have for an object creation of such production complex which would answer the world standards of reliability, quality and comfort of maintenance of passenger and freight air traffics and would allow this enterprise to go out on the profitable level of economic activity. It is foreseen to attract loan sources to the measures of the financial restructuring for financing of the program of technical modernization of enterprise and also to conclude a world agreement in obedience to which to foresee the postponement of settling debt with the subsequent arranging on the installment system of their payment. It must give time to an aviation enterprise for realization of measures of the operating restructuring, returning of loan money attracted for financing of these measures and to accumulate a money in sufficient volumes for beginning to reckon with debts which will be restructured in obedience to a world agreement. If financial pressures are caused by the action of external factors it is necessary to apply mixed control system by a debtor. In addition, there is an urgent requirement in the leadthrough of repair and continuation of resource of part of production capital assets for support of them in the suitable for exploitation state.

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V.M. Malyshko,
Candidate of legal sciences, associate professor
(National Aviation University, Ukraine)

RESPONSIBILITY FOR VIOLATION OF LEGISLATION IN INDUSTRY OF CIVIL AVIATION

In the materials of theses of a conference are examined economic and legal responsibility about violation of legislation in industry of civil aviation for the antilegal actions of legal and physical entities, activity of which is connected with the use of air space of Ukraine.

Economic and legal responsibility is determined as a duty of subjects of economic activity for sufferet by them offences to stand negative burdensome consequences of property or unproperty character as a rule which are foreseen by approval of norm of right.

V.K. Mamutov examines economic and legal responsibility as pointing of an economic organ unfavorable economic consequences directly to the applied statutory approval (limits of responsibility of economic character) for done offence [1, p. 178].

Such understanding of legal including economic and legal responsibility not only got support and confession in the general theory of law but also fixing in a current legislation in particular in st. 216 GK of Ukraine [2].

Legal and physical entities carry responsibility for illegal actions by law. Their activity is connected with the use of air space of Ukraine, development, making, repair and exploitation of aerotechics, realization of economic activity in industry of civil aviation, maintenance of air motion, providing of safety of aviation.

Financial approvals as a fine are used for offence in industry of civil aviation to the legal entities (subjects of aviation activity) in such cases: exploitations of air ship without documents which give a right to execute flights or with violation of term of action of such documents or requirements set by them; violation of requirements of the article of a 118 Code [3] in relation to obligatory of aviation insurance of civil aviation; violation of rules and order of the use of air space of Ukraine; implementation of flights on an air ship out-of-time servicing air ship of grant of services in carrying passengers or load by an air ship without the proper license and so on.

Air Code of Ukraine foresees all types of illegal activity and also kind of fines for the subjects of air transportation in Ukraine.

Affairs are examined about offences in industry of civil aviation by the authorized organ on questions of civil aviation, as a result of the consideration is accepted a decision.

The right to examine offences and to exact have leader of the authorized organ on questions of civil aviation and his deputies, government controllers and authorized on the leadthrough of verifications public servants of the authorized organ on questions of civil aviation on behalf of the authorized organ on questions of civil aviation.

Fine can be imposed on a legal entity who is the subject of aviation activity during six months from the day of exposure of offence but do not later than in three years from the day of his feasance.

Fines are imposed for every perfect offence separately in the case of feasance of legal subjects of aviation activity two or more offences.

Protocol is the foundation for consideration of business about offences in industries of civil aviation which are marked in st. 127 Code [3].

Making protocols about offences in industry of civil aviation is the right of leader of the authorized organ on questions of civil aviation and his deputies, government controllers and authorized on the leadthrough of verifications public servants of the authorized organ on questions of civil aviation, leaders of air-ports, chiefs of aviation security of air-ports services or their deputies.

Conclusions

Business about offence in industry of civil aviation is examined in fifteen day term from the day of receipt of the protocol about offence in industry of civil aviation by the authorized organ on questions of the civil aviation.

A fine is paid not later than fifteen days from the day of handing or sending the copy of decision of the authorized organ on questions of civil aviation about imposition of fine receipt by the subject of aviation activity.

In case if a fine is not prepaid in terms, fourth part of this article is set. The forced implementation of decision about imposition of fine is carried out by government executive service in it.

Sums of fines are set off in the State budget of Ukraine..

Decision in business about offence in industry of civil aviation can be appealed in a court in an order that is set by law.

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Olga V. Onishchenko, Ph.D. in Law, Associate Professor,
(National Aviation University, Ukraine)

SOME PECULIARITIES OF THE USE OF PERSONAL DATA

Nowadays the activity of human beings is not possible without providing information about themselves to other members of society, public authorities and civic organizations. As stated in Article 2 of the Law of Ukraine "On information" of 02.10.1992 [1], everyone has the right for information, envisaging the possibility of free obtaining, use, dissemination, storage and protection of information, necessary for exercise of their rights, freedoms and legitimate interests. And wide spread and application of information technology, global information systems, keeping of automated databases significantly simplifies the exercise of this right by citizens. But, despite all the advantages, there is one significant drawback: there is a high risk of unauthorized invasion in a private life of human being and illegal use of "private" data.

On January 1, 2011 the Law of Ukraine "On protection of personal data" of 1.06.2010 [2] came into effect. Adoption of the Law was the result of Ukraine's joining the European Convention for the Protection of Individuals with regard to Automatic Processing of Personal Data of 1981, which came into force for our country on 01.01.2011. [3]

Providing of personal data by a person is usually connected to the entry into certain legal relations (labor, civil, commercial, etc.). However, the implementation of the Law is not always consistent with the provisions of other regulatory acts.

Details or aggregate of details about natural person, who is identified or can be specifically identified, is a personal data. The primary sources of information on natural person are: documents issued in his/her name; documents signed by him/her; details that a person provides about himself/herself. Thus, information about employees that are reflected in personnel documents, including the age, date and place of birth, place of residence, identification number, social status, benefits under the law should be regarded as personal data, which in its totality make a personal data base or its part.

On the other hand, the employer, in accordance with current legislation of Ukraine, is obliged to have certain personal data of its employees. Thus, documentation of enterprises, institutions and organizations in electronic form and/or in the form of files that contains personal data of employees structured in some way is also considered as personal data base or part of it.

The ground of the right for use of personal data is consent of the subject of personal data for processing of his/her personal data. According to Part 2 of Article 11 of the Law of Ukraine "On information" of 02.10.1992 [1], collection, storage, use and dissemination of confidential information about a person is not allowed without his/her consent, except the cases determined by law and only in the interests of national security, economic welfare and protection of human rights.

As stated in Paragraph 1 of Part 1 of Article 11 of the Law of Ukraine "On protection of personal data" of 01.01.2011, the ground of right to use the personal data is the consent of the subject of personal data for processing of his/her personal data. Thus, on one hand, the legislator empowers a natural person with the right to give consent for the use of his/her personal data and, on the other hand, provides for administrative and criminal responsibility of the holder of personal data for its use without such consent.

At the same time, the mentioned Law does not stipulate what the holder of personal data bases has to do, if the subject of personal data refuses to give consent for use of his/her personal data.

According to Article 24 of the Labor Code of Ukraine [4], while concluding the employment contract, a citizen must submit a passport or other identification document, labor record book (employment history), and in cases stipulated by legislation, - also the document about education (specialty, qualification), about the state of health and other documents.

According to Part 1 of Article 22 of the Labor Code of Ukraine, unjustified refusal of employment is prohibited. Accordingly, it is not possible to conclude an employment contract with a person without collecting, and further, keeping and using of his/her personal data. It is also impossible to refuse hiring due to the fact that a person is not giving consent for the use of his/her personal data.

This problem is becoming relevant in one more aspect. After strengthening measures of liability for violation of the Law, employers have begun actively requesting employees to give consent for the use of their personal data, which had actually been received while hiring. The majority of employees sign such agreement "automatically", but some do absolutely refuse. Again, the question arises what the employers have to do so that they do not bear responsibility for illegal processing of personal data? As of today, one may count only on the State Service of Ukraine for Protection of Personal Data that it will understand the existing situation while conducting its inspection.

In view of the above, there are several options to solve the situation. When it comes to personal data that a person must necessarily submit while entering into one or the other legal relations under the current legislation, one should proceed from the fact that consent is presumed. Thus, it is not necessary to provide it separately. At the same time, the natural person retains all rights for his/her personal data foreseen by the Law. This can be done by including into the Law a provision about the cases when consent of the subject of personal data is not required. For example, the processing of personal data of employee for exercising rights and performing responsibilities in the field of labor relations, calculation and payment of taxes and duties does not require consent of the employee. Other option is to foresee an algorithm of actions for the holder of personal data in case, if the subject of such data does not give consent for its use.

Interesting is the approach of Russian legislators. In particular, Article 9 of the Law of Russian Federation "On personal data" of 08.07.2006 stipulates that this Federal Law and other federal laws provide for cases of compulsory provision of personal data by the subject of personal data with the aim to protect the foundations of constitutional order, morality, health, rights and legitimate interests of other persons, ensuring national defense and state security [5].

I would also like to draw attention to a problematic issue of destroying of personal data of employees. Pursuant to Paragraph 2 of Part 2 of Article 15 of the Law of Ukraine "On protection of personal data" of 01.01.2011, personal data in a personal data base shall be destroyed in case of termination of relationship between the subject of personal data and the holder or manager of the base, unless otherwise provided by law. In labor relations, such "termination of legal relations" will be termination of employment agreement between the employee and the employer. However, according to the List of typical (model) documents that are created in the activities of public authorities and local governments, other enterprises, institutions and organizations, with indication of the time periods for storing of documents, approved by the Order of Main Archival Administration under the Cabinet of Ministers of Ukraine No. 41 of 20.07.1998, personal files of employees must be stored for 75 years [6].

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N.B. Shust,
Doctor of Social Sciences, Professor
(National Aviation University, Ukraine)

THE FORMATION OF PROFESSIONAL COMPETENCE AND CAREER DEVELOPMENT IN THE SYSTEM OF LIFELONG EDUCATION

Annotation: *The author analyzed the features of formation of professional competence in the system of lifelong education*

Since Ukraine has got access to the international educational programs, the education is considered as a quality of conformance to the actual results of market conditions; indicator of material, technical and resources provision; complex indicator of prestige and economic efficiency factors; indicator of content perfection, accomplishment of technologies and evaluation system of achievements; indicator of investment suitability.

Therefore, the formation of modern society and changes in the socio-economic and intellectual development of the state requires training of a new generation of specialists and improvement of lifelong professional education. The implementation of this strategic task involves updating of the content and structure of higher education. That is: 1) adaptation of education to the needs of the economy and society; 2) reproduction of human resources for industry, science and education.

The basic principles that determine the development of higher education in Ukraine in this field are:

- creation of space for innovation on the basis of educational and scientific support;
- supporting of social context of higher education;
- adaptation of system of higher education in Ukraine to the norms, standards, basic principles of the world educational space.

In this context, world leaders in combining teaching and research activity are higher educational establishments that are educational, research and scientific-industrial complexes and closely associated with business and industry.

Universities have become generators of new knowledge of theoretical and practical orientation. This is due to the features of modern higher educational establishment as a research institution. In particular, this is:

1) ability to generate and provide transfer of modern knowledge;
2) focus on research and development, especially on basic research;
3) availability of training system of specialists with scientific degree;
4) high level of information openness and integration into the international system of science and education;
5) formation of special intellectual environment, scientific and technical and economic space (for instance, technoparks, various clusters) etc.

A positive step in the activity of the government of Ukraine is taking measures to ensure the priority development of education in Ukraine in order to improve the functioning and development of innovative education in Ukraine, improving its quality and accessibility, its integration into the European educational space, preserving national achievements and traditions.

The country aims to create conditions for increasing computer literacy of the population.

The government proposes to carry out activities, aimed at developing pre-school and vocational education, providing information and communication technologies into the educational process of general education establishments, improving the work with talented young people, improving the quality of natural and mathematical education, supporting the leading universities of Ukraine to enter the number of higher educational establishments, that are recognized all over the world.

Conclusions

It should be emphasized that professional competence effects career development and strategic objectives of higher education in this regard are:

- to activate policy of forming an attractive internal labor market;
- to stimulate the formation of middle class as a factor of social stability;
- to develop and implement targeted programs, which support the equalization of demographic development of the regions of Ukraine with regard to the particular features of each region;
- to prepare an inventory and reconcile uncoordinated variety of social programs;
- to reform the system of social care to strengthen its focus on vulnerable social groups.

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O.O. Starytska, senior lecturer
(National Aviation University, Ukraine)

FEATURES OF CONSUMER PROTECTION IN AIR TRANSPORT OF UKRAINE AND THE EUROPEAN UNION

In the article author examines the features of protection of passengers, as the consumers of air transport of Ukraine and the European Union

Transport industry is one of the most important spheres of social life, which is designed to meet the needs of people in traffic. Development and adaptation of the transport legislation of Ukraine is not only based on national programs, but also on the achievements of scientific and technical Progress and of borrowing practices of the legal regulation of this sector in different countries.

Transport sphere in territory of Ukraine is represented by different species, one of which is an air. The main advantage which lies in the rate delivery of passengers and cargo express both small and long distances. That is why, the peculiarity of transport consumer protection, the main accent in the legislation focuses on the safety of users of transport.

Thus, European transport policy, in the development of regulations in this area, particular attention is drawn to the fact that every user must enjoy the use of a transport system that would meet their needs and expectations [5, c. 415].

In view of the absence of a clear and complete settlement of consumer protection in the aviation transport sector of Ukraine, will try to figure out how the passenger can protect their right to the proper and quality services. It is necessary to note, that this area of relations between the passenger and the carrier will be subject of the rules that govern the same services. The current Civil Code of Ukraine regulates only the regulation of the air transportation, but does not protect the rights of consumers-passengers. Although in Part 1 of Art. 101 the new Air Code of Ukraine which has been accepted 19 May 2011, resolved that the competent authority for civil aviation controls over compliance with air carriers and other business aviation regulations air transportation of passengers, baggage, cargo and mail and their compliance and rules established by international treaties of Ukraine and Ukraine aviation regulations, particularly regarding the rights of passengers and consignors which use services of the air transport, and requirements for consideration of the passengers and consignors. Also, in Part 2 of the same article noted that in the case of such appeal authority for civil aviation makes decisions about: 1) absence of a breach of carrier legislation, including aviation regulations Ukraine, 2) the presence of a breach of airline requirements legislation, including aviation regulations of Ukraine, with the number of violations and the date by which the violation must be corrected [1, art. 101].

We believe that the negative moment of such situation is the fact that our countrymen usually buy tickets to economy class without worrying about the issue of quality of service and flight. Domestic consumers are willing to suffer poor service because the main purpose of "air service" is to fly to the place of destination and desirable for little money.

That is why, the bill "On protection of air passengers in the event of denial of boarding, cancellation or delay of their flight" provided the basic rights of passengers in the event of denial of boarding, cancellation or delay of their flight. Thus, the bill provides for the rights of passengers: the passenger rights for denial of boarding the flight, the right to compensation, the right to refund amounts or for another route, right to care, the rights of persons with limited mobility and other persons with special needs entitled to compensation [2, art. 3 – 11].

However, there are also positive moments. In particular, the present air passenger services market, both in Ukraine and in Europe and the U.S. is growing rapidly, creating in this competitive relationship. There is a direct war for the consumer, and weapons in it are the quality services, a complete and accurate information available pricing, etc. [5, p. 415].

When travelling by air for business or pleasure, you have certain rights when it comes to

information, delays, cancellations, overbooking and damage to your luggage, thanks to EU rules. The rules apply even if there are extraordinary circumstances which caused the flight disruption. These rights apply to scheduled domestic flights within an EU country and to charter flights leaving or arriving at an EU airport. For flights arriving from outside the EU, these rights only apply to EU airlines.

The area of air passengers´ complaints is covered mainly by two pieces of legislation: EC Regulation 261/2004 and the Montreal Convention. In addition, principles of contractual law may apply.

The Regulation came into force within the EU Member States in February 2005 and governs air passengers' rights when flights are either cancelled or delayed or when passengers are denied boarding. It applies to all flights departing from a Member State airport and all flights arriving in these countries if the airline has a license issued by an authority in a Member State.

The Regulation states that if a flight is cancelled or a passenger is denied boarding, airlines must offer the passenger the choice between being re-routed or reimbursed. If the passenger chooses re-routing to the final destination at the earliest opportunity, the airline must provide care until he reaches his final destination. This includes providing meals, refreshments, communication facilities, and in those cases where a re-routing cannot occur on the same day, the airline must provide hotel accommodation and transportation between the hotel and the airport. If the passenger chooses to be reimbursed, the airline no longer has a duty to provide care and the passenger must make other travel arrangements himself.

The Montreal Convention (1999), which came into force in November 2003, has been ratified by around 130 countries, including all the EU Member States, and regulates the delay of passengers, as well as the delay, damage or miscarriage of their baggage.

The Convention is applicable on international flights, in those instances where both the country of departure and arrival have ratified the Convention. It has been transposed into EU law

by Regulation 889/2002 and is therefore applicable to all flights within the EU, both domestic and international.

The main rule set out in the Convention is that the air carrier is liable for losses suffered by passengers unless the air carrier can prove that it or its servants and agents took all measures that could reasonably be required to avoid the damage or that it was impossible for them to take such measures.

When a passenger decides to purchase a flight from an airline, the flight from A to B, the greement is governed by contract law just like any other type of contract. There are no common rules on the purchase of services, so in each instance it will be the domestic national legislation that will apply and which will determine the remedies in case of breach of contract. If the passenger is a consumer, EC legislation on unfair commercial practices and unfair terms will also apply to these agreements.

If you check in on time for a flight and there is a significant delay, the airline must provide you with meals and refreshments, hotel accommodation, if necessary, and communication facilities.

The airline also has to give you a written statement about your rights as a passenger. When the delay is 5 hours or more, the airline should also offer to refund your ticket, but only if you decide not to take the delayed flight. There is no financial compensation for delays.

If there are too many passengers booked for the seats available, the airline firstly has to call for volunteers willing to give up their seats. It is only then that an airline can decide not to take certain passengers on board. It is then obliged to offer you financial compensation. You are also entitled to meals and refreshments, hotel accommodation, if necessary, communication facilities and a written statement about your rights as a passenger.

If your flight is cancelled due to reasons within the airline's control, the operating airline should provide you with either a refund of your ticket or alternative transport to your final destination. Under certain circumstances and, if the cancellation is not as a result of a *force majeure* incident, the airline has to pay you financial compensation.

It also has to give you meals and refreshments, hotel accommodation, if necessary,

communication facilities and a written statement about your rights as a passenger.

Also, you may claim compensation for destruction, damage, loss or delay of your luggage on a flight by an EU airline, anywhere in the world [3, 14 – 16].

In some circumstances, when a consumer cannot reach an amicable solution dealing directly with the airline and where the intervention of ECC-Net proves unsuccessful, and where there is neither a designated ADR body nor can the assistance of an NEB be offered, the consumer is left with no other option but to pursue the matter further through the courts.

Taking legal action is complex by its very nature; however, taking legal action in a cross-border context involves signii cant expense, time, language problems, and travelling to the country of the air carrier. Given that ECCNET or any other network acting at a European level cannot assist consumers in taking legal action, in most of these cases consumers are not prepared to go to court, particularly if the cost of doing so would exceed the amount of compensation claimed [4, p. 15].

We believe that the state must also be taken certain steps. In particular, the national policy of detailed regulation of relations between the passenger and the airline, as it would be desirable for legislation to prescribe that the consumer can expect in case of violation of his rights.

In conclusion, the purpose of European Nation report in the sphere of aviation is to help build a more secure and improved climate for consumers who are travelling by air to, from and within the European market. Consumers should be able to travel safe in the knowledge that airlines will respect their rights and that the rules will apply equally to all airlines. Knowing your rights is good, but being able to exercise them is better.

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S. Vyshnovetska, Candidate of Law,
V. Vyshnovetskyy, Candidate of Law
(National Aviation University, Ukraine)

FEATURES A SENIORITY PENSION YEARS EMPLOYED PILOTS AIRCRAFT UKRAINE

Article is devoted to the substantiation of expediency of the preferential pension pilots of aircraft in terms of pension reform. In particular, analyzes the features of the pension for long service employees pilots of civil aviation and flight personnel of the Armed Forces of Ukraine.

Whereas civil aviation is one of the basic industries, we believe that special pensions for workers in this field should be saved. So, to fully analyze each specific provision that provides for additional guarantees for this category of workers. One of these safeguards is a pension for retirement.

According to Art. 51 of the Law of Ukraine "On Pension Provision" of November 5, 1991 [1] pension seniority established certain categories of people employed in jobs that produce the loss of professional performance or fitness for onset age, pensionable age. That is, the right to this type of pension is not a general range of citizens, as retirement age, and only certain categories of workers listed set out in Articles 52, 54 and 55 of the Law of Ukraine "On Pension Provision", and other special regulations instruments. Among workers who are entitled to a pension for long service in the art. 52 mentioned Act specified certain categories of workers of aviation and flight trial ended.

It is necessary to distinguish between workers of civil aviation pilots and flight personnel of the Armed Forces of Ukraine. Regarding the second should be noted that based on the content of art. 3 of the Law of Ukraine "On social and legal protection of servicemen and their families», a person belonging to the military [2]. Thus, in accordance with Art. 15 mentioned the retirement of these persons is governed by special law.

Thus, according to Art. 1 of the Law of Ukraine "On pensions for persons released from military service, and some others" [3] such persons set out in the presence of this law of service in the military are entitled to a lifetime pension for long service. According to Art. 5 persons exempt from military service and other persons who are entitled to a pension under this Act, and their family members may be appointed (at their request) pension under and in accordance with the Law of Ukraine "On Compulsory State Pension Insurance" .

Article 12 of the Law of Ukraine "On pensions for persons released from military service, and some others" were provided for retirement for years of service regardless of age if they are on day release from the service seniority of 20 years and more. With the adoption of the Law of Ukraine "On measures to ensure the legislative reform of the pension system" on July 8, 2011 [4] was amended to this article, under which pension for years of service to persons appointed officers, warrant officers and warrant officers, soldiers and military service of long-service contract, other persons specified in paragraphs "b" - "e" of Article 1-2 of this Law, who occupied positions of pilots and the floating of the submarines of the Armed Forces for at least 20 years old, regardless of age if they have on day release from the service seniority of 20 years and over, except for persons referred to in Article 5 of this Act.

Retirement for years of service to persons with seniority of 20 years and over, was designed in a 50 per cent, for each year of service over 20 years - 3 per cent of the amounts of money (Article 13 of the Act). The maximum amount of pension calculated under this Article shall not exceed 90 per cent was appropriate amounts of money. With the adoption of the Law of Ukraine "On measures to ensure the legislative pension reform" in the part of the second century. 13 Law of Ukraine "On pensions for persons released from military service and certain other persons" as amended, under which the maximum pension must not exceed 80 percent is the appropriate amounts of money.

According to Art. 43 maximum amount of pensions, appointed pursuant to this Act (including bonuses, increases, supplementary pensions, targeted financial aid, pension for special merits before Ukraine and other payments to the pension established by law) may not exceed twelve times the minimum retirement age set cording to Article 28 of the Law of Ukraine "On Compulsory State Pension Insurance". With the adoption of the Law of Ukraine "On measures to ensure the legislative pension reform" of this century. 43 described as follows: "The maximum amount of pension (including bonuses, increases, additional pension, targeted financial aid, pension for special merits before Ukraine, indexing and other payments to a pension by law, except for extra allowances to certain categories of persons have made special contributions to the country) can not exceed ten subsistence minimum established for persons incapacitated. Article 2 of the Law of Ukraine "On measures to ensure the legislative pension reform" also provides that the maximum pension, designed according to the Law of Ukraine "On pensions for persons released from military service and certain other persons" shall not exceed ten living wages, established for persons incapacitated.

In c. 17, which defines the types of services and times, are transferred to the seniority for the pension, stipulates that the seniority in the appointment of pension under this Act additionally counted the time of their training (regardless of training) in civilian universities, and in other schools, after which the officer is assigned (special) degree, to join the military service, service to the police, state fire, authorities and civil protection units, the tax police or the State Criminal-Executive Service of Ukraine or by appointment appropriate office within five years at a rate of one year of training for six months service.

In appointing pensions to persons who are entitled to a pension under this Act, are only full years of seniority or insurance record without rounding the actual amount of seniority or insurance experience forward.

These calculations determine the seniority and preferential conditions pensions to persons who are entitled to a pension under this Law, the Cabinet of Ministers of Ukraine. Thus, according to the Cabinet of Ministers of Ukraine "On procedure of calculation of seniority, appointment and payment of pensions and financial assistance to officers, warrant officers, Midshipman, military long-service and military service under the contract, party officers and ranks of police and their Family »№ 393 of July 17, 1992 [5] to seniority pensions to count on favorable terms a month of service for two months to work in flying jet and turboprop aircraft, except aircraft types listed above - one month of service for six weeks to work in flying aircraft.

Define categories of civil aviation and the order of their pensions regulated by Article 54 of the Law of Ukraine "On Pension Provision" dated November 5, 1991 and the Cabinet of Ministers of Ukraine № 418 of July 21, 1992 "On approval of regulations on pensions for long service employees of aviation and flight trial of the "[6].

Cabinet of Ministers of Ukraine № 418 of July 21, 1992 approved: These calculations terms of seniority pensions for employees of the Flight of [7] List of office workers pilots, work on which pensionable for retirement [8] procedure appointment and payment of pensions for long service employees flight trial of civil aviation [9].

According to Art. 54 of the Law of Ukraine "On Pension Provision" right to a pension for long service employees with flight and flight trial ended in time-in-service years in these positions at least 25 years in men and at least 20 years for women regardless of the subordination of enterprises, institutions and organizations in which they engaged.

These employees are exempt from flight work for health reasons (illness) in the presence of seniority in men at least 20 years and women at least 15 years are eligible for a pension in proportion to hours worked.

Hence, p. 54 of the Law of Ukraine "On Pension Provision" of workers separates pilots and flight of the trial, although it establishes a level playing field for pensions for long service. On this distinction and indicates the presence of two separate regulations: Procedure for calculating the terms of seniority pensions for employees of pilots and order of appointment and payment of pensions for long service employees of the test flight of civil aircraft, which pensionable for retirement. This list includes, inter alia, the following positions as:

1. Crew members of aircraft and other aircraft.

2. Flight Instructors.

3. Command pilots: heads (their deputies), inspectors and other specialists with flight service (flight of) ministries, departments, associations, enterprises, institutions, organizations and business units, which are active flight certificate and participate the flight crew in an aircraft or another aircraft.

4. Skydivers of all kinds, rescuers and firefighters, all paratroopers names, instructors, fire fighting service managers, parachute (parachute and rescue, search and rescue) units, employees and freelance staff paratroop groups engaged in parachuting or slopes (slopes) on special pull-lifting devices from helicopters, which are at a height of not less than 10 meters.

Employees who hold positions not listed in the List, the payment of long service are not even in the performance of flight, since flight performance of their duties and not part of their ongoing flights are episodic in nature.

Thus, the payment of long service are workers who are in positions listed in the list, and have a long service duration. This right is not associated with age, the employee and if the established seniority employee may apply for a pension regardless of age.

Pensions for long service in accordance with Article 54 of the Law of Ukraine "On Pension Provision" and the order of appointment and payment of pensions for long service employees flight trial of civil aviation personnel assigned flight trial ended directly involved in flight tests (research) and research series aircraft, aerospace, paratroop equipment, regardless of departmental affiliation enterprises and organizations where they work.

Seniority, giving the right to retire for years, consists of working hours on air crew positions on actual conditions of flight in the working year. Breaks in the total work experience or work experience in these positions do not affect the calculation of seniority, as seniority calculation is not associated with continuity of service.

Time for pilots to positions of seniority counted not only in calendar order (month by month). There is a preferential method of calculating seniority, which is that periods of intensive bloom included in employment increased in size. In the raid, more than a normal set per year, calendar time for flight positions counted for seniority in the higher amount - half a year, year after two years. When plaque below this standard time included in the employment of a single size. For a complete absence of plaque in the calendar, this year is not counted for seniority. Norms plaque for preferential seniority calculations are different and depend on the complexity of the flight, flying opportunities for technical data of aircraft and types of flights.

We watch a preferential method of calculating the terms of seniority for employees of the test flight of civil aircraft in comparison with employees pilots.

In general, when pensions for long service employees pilots of aircraft counted the number of (flying hours) and quality (type of flight) work. Obligatory condition of the pension is termination of the positions that are entitled to a pension for long service to pilots, that dismissal as provided in the above list.

Please note that the effect of art. 53 of the Law of Ukraine "On Pension Provision" applies to employees of the test flight, retired to the Law, ie to November 5, 1991. As for workers from among persons of flight crews of aircraft of civil aviation performance art. 53 of the Law of Ukraine "On Pension Provision" applies to those persons who retired before the enactment of the law, that is, until April 1, 1992. This position of the legislator is not entirely clear.

Thus, the conditions for retirement for years of service of civil aviation pilots are determined by the Law of Ukraine "On Pension Provision", and determine the amount of pensions is on the Law of Ukraine "On Compulsory State Pension Insurance" [10].

Conclusions

To summarize, we can conclude that under any circumstances, pension seniority pilots of aircraft not be unreasonable for the benefit of early retirement, as the flight activity is not long and

this category of workers much earlier retirement age becomes a professional capacity. At the same time needs to improve regulation of pension pilots of aircraft, primarily for the unambiguous determination of the subjects, which is entitled to a pension for retirement. Unambiguous terms, overcoming conflicts would taking separate legal act that would comprehensively regulate the order of pensions for long service pilots of aircraft.

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I.Zarubinska, DrSci (Pedagogics), Assoc.Prof
A.Polukhin, PhD (Engineering), Prof
(National Aviation University, Ukraine)

SPECIFIC APPROACH TO FOREIGN STUDENTS TRAINING AT THE NATIONAL AVIATION UNIVERSITY

The main approach to foreign students training at the National Aviation University is based on the International Quality Standards ISO 9001:2008, and is oriented to full satisfaction of requirements and expectations of employers and students.

The right to education is a fundamental right of human being. Education is the key to sustainable development of the world and stability of relations among countries. There exist necessary means for effective participation of people in social life and in economy of the twenty-first century, under the conditions of accelerated globalization. UNESCO recognized that "Policy is aimed at fight against poverty, protection and improvement of human health, reduction of child mortality, improvement of international mutual understanding and enrichment of ethnic cultures. This policy will not be effective without responsible strategy in the field of education. Efforts, which are focused on ensuring of competitiveness in the field of advanced technologies will be unsuccessful" [1].

However, over recent years people more and more often speak about global crisis of education. The assertion of this fact had already exceeded from scientific literature into official documents and statesmen' utterances. In particular, in the report of UNESCO "Global monitoring report. Education for all. The hidden crisis" (2011) some alarm of a state of affairs in the field of education is felt: "Six aims of general and a variety of specific tasks were formulated in "Dakar Framework for Actions in Education for All", which were accepted by governments in 2000. These aims should be realized till 2015. Today, ten years after the event, the main conclusion is that the governments do not realize their collective responsibilities all over the world. Inability to achieve the Dakar aims will have serious consequences. The acceleration of educational advancement has the most important meaning for achievement of extended aims, formulated in Millennium Declaration in such fields as alleviating of poverty, ensuring acceptable food, children survival and mother health" [2].

The essence of education world crisis is seen, first of all in orientation of existing system of education (so called supporting education) to previous experience but not the future. Modern development of society demands conceptually new paradigm of innovative training. This innovative training should form the student's ability to project future determination, to understand and take personal responsibility for it, to obtain professional abilities to meet challenges of the future.

The permanent expansion in the number of foreign residents, who study abroad is another defining trend in functioning of the world education market of today. For example, 3.7 million foreign students studied in all countries all over the world in 2011. It is indicative that the increase is 77% in comparison with the year of 2000.

Different numbers of foreign citizens are accepted by higher educational establishments of the USA (18%), Great Britain (10%), Australia, Germany, France (7%), Canada (5%), Japan, Russia (4%), Spain, Ukraine (2%).

It is necessary to note that students' academic mobility (as well as instructors') belongs to the area of Bolognese Declaration provisions together with the main target. It includes the necessity of graduates' competitive growth by improvement of quality of European higher educational system. Among provisions of Bolognese Declaration a relatively modest position is designated to the quality problem. The Declaration states that assistance to the European collaboration in the field of quality rating can be achieved with the help of development of comparative criteria and methodologies". There are no doubts that the quality of European higher education is in the centre of attention of initiators and participants of the Bolognese process. The main substantial task is the increase of education quality, while other provisions, including mobility,` determine only basic mechanisms of the most important fields of realization [3].

In 2011, according to State Statistics Committee of *Ukraine*, 2.5 million students are being

trained, among them 48 thousand – foreigners, which is 2 percent of the total number of students in the country. In comparison with the previous year 2010 the amount of foreign students in Ukraine has increased by 2.6 thousands. The greatest number of foreign students in Ukraine are from China – approximately 6 thousands, Turkmenistan – 5.5 thousands, Russia – 4 thousands, India – 3 thousands.

The National Aviation University (NAU) – is a multicultural higher educational establishment which has a longtime experience of specialists training for many sectors of national economy. One of the well known University activities is a training of aviation specialists not only for Ukraine but also for the aviation sphere all over the world. The first foreign students came to the Kyiv Institute of Civil Air Fleet in 1949. From that time more than 7300 aviation specialists from 148 countries have been trained, 250 persons asserted postgraduate and doctoral dissertations.

Nowadays 1316 foreign residents from 49 countries of the world are being trained at the National Aviation University, among them students from CIS and Asian countries compose 89% of all foreign students. The largest groups are from Uzbekistan (408 persons), China (209 persons), Turkmenistan (140 persons), Azerbaijan (127 persons), Iran (107 persons), Turkey (103 persons) and Russia (81 persons).

It is known that CIS and Asia countries being main providers of foreign students to the National Aviation University are characterized by complicated period in their development, by variability of socioeconomic and political situations. Social standards of living are greatly different in comparison with European standards. Some other challenges are dictated by rather long distances between the leading scientific and educational centers in Ukraine. Transportation costs essentially reduce educational mobility of young people. Existing differences in educational systems of different countries put forward additional problems.

It becomes evident that economical, political, ethnonational, psychological and other reasons play a very important role in choosing the University to study at. Because of these reasons young people, do not risk to go to another city or country, choosing one or another higher educational establishment.

So, if a student chooses the National Aviation University, it means that he must know and evaluate all the attractive reasons. What are these reasons?

- The opportunity to get higher education in prestigious higher educational establishment with the diploma recognized all over the world for further training at post-graduate courses. It can be also a chance to get a good job in the native country.
- The opportunity to choose the education in the fields and professions which are not available in the native country.
- The opportunity to realize a chance of getting the second profession at a time. For example, a future mechanical engineer can get the diploma of a lawyer, an aviation psychologist or a computer engineer.
- The opportunity to study using official languages of International Civil Aviation Organization (ICAO) (Russian or English) and to get the certificate which confirms the level of English.
- Additional certificates in aviation safety can be obtained after participation in the courses realizing ICAO standards and recommended practices.
- The opportunity to live for a few years in a city or country which is different in educational, scientific, ethnical and social senses. As a result everyone can get a higher level of his self-estimation as an individual.
- Reasonable tuition fees, acceptable living conditions, physical, legal and economic safety in a place of residence.

Obviously, fulfilling the abovementioned wishes and meeting the expectations of young people is a problem that includes many components. There may be a question: 'Is the National Aviation University able to fulfill such a great deal of wishes and meet the expectations of young foreign students?' The answer is: 'We try our best to do this'. Certainly, we have a lot of things to do and we know how to reach the goals like that.

The objective of the University activities is to establish the constant and stable relationships with Ukrainian and foreign students. There should be short-term, middle-term and long-term strategies for these relationships to give us an opportunity to settle facing problems, make and implement effective decisions, take actions to increase the quality of training and to improve living standards of students.

The experience of new educational technologies implementation has been gained by the

University. It shows that educational process requires understanding and practical application in order to combine the current elements and the elements to come in future. The purpose of combining those elements is to create new educational interconnected systems to guarantee increasing of theoretical and practical training level of the higher education experts.

Considering the global labour market trends it is necessary to underline that only competitive experts can get a job due to the main criteria like: high professionalism, knowledge of modern methods and technologies innovations, decision-making, ability to work in world information environment, speaking one or several foreign languages fluently, understanding of the main principles of relationships, creativity, communicability, high efficiency, ability to obtain positive results.

That is why the authorities of the University have implemented the Quality Management System (QMS), based on ISO 9000 standards, into the educational process which is one of perspectives to increase training quality and competitiveness of the experts. That system was developed, applied and certified at the University in 2008. QMS certification was performed by Veritas Certification Bureau (international office of certification). In accordance with the established procedures, the recertification was performed in 2011 which confirmed the University compliance with international standards of quality ISO 9001:2008. We would like to mention that the National Aviation University has become one of the first higher educational establishments in Ukraine which implemented the QMS into the educational process and researches in accordance with international standards of quality ISO 9001:2008.

The customers' requirements are regarded as the main component included in the QMS. The educational process of the University is developed in order to assist a student to receive knowledge and skills which comply with an employer demands.

Besides the customers' requirements there are some additional issues of the QMS such as terms and forms of training, possibility of having some practice given by an employer. For example, most airlines want the staff to know aviation regulations, to have good knowledge in Aviation English at a professional level in compliance with ICAO standards as well as special regulations of Eurocontrol and other international aviation organizations.

In order to ensure that the graduate students' level of speaking English complies with ICAO standards and to increase their level of competitiveness at the global labor market, so called 'English project' is implemented at the University. Within this project the whole educational process is performed in English and includes 16 specialties. It gives an opportunity to prepare experts that comply with the requirements of Ukrainian and foreign employers. The English speaking groups consist of citizens of Ukraine, countries of the former Soviet Union and other countries. The graduate students of 'English project' receive the University Diploma and a certificate which confirms their professional level of speaking English.

One of the main tasks of the University is facilitating foreign students' adaptation to new living and training conditions in Ukraine. The young foreigners' adaptation process consists of some components:

- Adaptation to climate conditions of Ukraine and time difference.

- Social and cultural adaptation to living and sanitary conditions, solving social and religious problems, spending leisure time and so on. Foreign students have to communicate with native speakers in different languages and to adapt to different cultures, life and study in the multicultural society. It is necessary to take into account that foreign students have lived under the influence of some ethnical and cultural factors. They have their own world outlook, goals, convictions and behavior that depend on their cultural peculiarities and national traditions.

- Language adaptation. After arriving in Ukraine, due to insufficient level of speaking Russian, Ukrainian or English foreign students have got difficulties in communication. It is complicated for them to solve the problem of speaking and that is why they spend a lot of time with their countrymen or working with computers. It is so hard to study in a different language. There may be some psychological discomfort, suffering, anxiety, frustration, longing for the native country because all foreign students may pass through emotional overload. It is necessary to mention that during last ten years some students coming to the University from the countries of the former Soviet Union are not able to speak either Russian or English. In that case their situation can be very critical, because they are not able to speak any language of international communication.

- Academic adaptation. Foreign students have to adapt to the Ukrainian educational system, Ukrainian standards of education, educational process, teachers and methodological aspects of training. A negative aspect is that some of students arriving to study at the University do not have sufficient knowledge and skills in math, physics, and chemistry which are very important and required for receiving higher education in engineering.

Our experience of work with foreign students shows that Chinese students are the most prepared for the studying at the National Aviation University. They are followed by students from some African countries (Nigeria, Congo, Ghana), Iran, and Turkey are the next.

In response to this, the preparatory training system, and, namely, the training division of the foreign students study department, plays a significant role in the knowledge level "stiffening", from poor to sufficient, for students from other countries who came to study at the University. And it functions quite well. It can be proved by the average results of the entry tests and final tests after a ten-month program study by newcomers to the University. In accordance with the University criteria of evaluation the results are the following (table 1):

Table 1

Subject	Input test	Final test
Mathematics	85%	94%
Physics	81%	92%

Unfortunately, not all the foreigners are keen to become highly qualified specialists. Some of them are not interested in academic achievements. There are those, who just are unable to learn the University studying material because of the very low level of school knowledge. As a result, during the whole studying period, from the first till the fifth-sixth year of study, we have to dismiss up to 25% of the initial amount of the first-year students. And this happens in spite of the fact that much attention is paid to foreign students from the administration and the teachers of the University. Individual tutoring, small number of students (12-15) in academic groups, highly qualified teachers are among the measures taken to help foreign students.

We cannot act differently, as the name and the achievements of the University are very valuable for us. Successful foreign graduates are our brand, recognition in the world, competitiveness, rating and all the other following issues.

Conclusions

The dynamics of the National Aviation University development based on the concept of transforming it into a higher education institution which is achieving a full compliance with the international educational standards allows to make a conclusion that the University will successfully integrate into the international educational and scientific space.

The implementation of the Quality Management System, based on the International Quality Standard ISO 9001:2008 stimulates the process of attraction, competitiveness and prestige of the University among Ukrainian and foreign citizens.

The main assignments of the University in the context of work with foreign students is providing the appropriate environment for their adaptation – adjustment to new unusual living and studying conditions and upgrading their knowledge level up to the proper and sufficient one for studying at the University.

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A.M.Ovsyankin , PhD, V.M.Yudka (National Aviation University, Ukraine)

IMPLEMENTATION OF METHODOLOGY OF "SIX SIGMA" IN THE PREPARATION PROCESS OF THE MASTER'S IN "SPECIFIC CATEGORIES"

Considered the problems of implementation and application of the methodology "Six Sigma" in the preparation of masters' in "specific categories" (in "Project Management"), the main ways of its implementation, including the selection and approval criteria for the evaluation of the basic processes. The attention was accented to organizational principles of system implementation.

Actuality of the problem. The "Six Sigma" is a consistent and structured scientific-based system that covers most of not only production but also any other business processes of any company. The most prominent variant implementation of the system is considered preparing to manufacture new products (services) of the definition of the requirements of consumers, forecasting of the development of needs, definition of specific parameters of products (services). This requires the collection, processing and analyzing large volumes of information, the use of considerable resources. The "six sigma" - highly organized process that allows you to focus on developing and manufacturing products and providing services that are close to ideal.

The system "Six Sigma" - a modern management system that aims to explosive increase organizational performance, profit by reducing costs and satisfy customers [1].

Implementation of the system associated with a profound transformation of the culture of an organization that provides projective style of management, methods of team-work practices, the principle of the leadership of competence, leadership,continuous improvement, integration of methods of statistical methods of quality management [2].

Statistical method for assessing organizational performance with the help of universal metrics, such as the "six sigma" can be applied to any business process that allows you to find a point of focus for project improvement and effective quality management.

Implementation Methodology "Six Sigma" in the process of providing educational services in higher education, particularly in the process of education of the masters' in "specific categories" (in "Project Management") is the actual problem, because these experts will decide on the development of innovative technologies products and services [3]. The education services may also be constantly evaluated by consumers, which in this case are the students and their employers. Identification of quantitative criteria for evaluating the quality of educational services - the first step towards an integrated implementation of "Six Sigma" in management of any division of an educational institution.

Methods of implementation problems. The system of "Six Sigma" can be viewed from different perspectives: as a statistical indicator of quality, as the cycle of improvement, as a set of tools, etc. Every facet of an important and they are all closely interrelated. One can consider several key aspects of the system.

"Sigma" (σ) is traditionally used in statistics to indicate the extent of fluctuations of a magnitude on average. Many sets of statistics are subordinated so-called normal distribution. Graphically, this distribution shows "bell-shaped" curve, which peaks corresponds to the average value of measured parameters of the process. Sigma (graphically) - a point of inflection of the curve, where the "bulge above" becomes "a bulge below" (рис.1). Standard (or mean square) deviation - a deviation from the average mean. The theoretical framework is based on the position by rating possible statistically managed process to meet specified requirements, taking into account scatter and centralization [4].

"Sigma" - the standard deviation of the normal distribution law (assessment spread of measured values relative to the mean value) can be represented by the expression:

$$\sigma = \frac{\sqrt{\Sigma(X-T)^2}}{n-1},$$

where T - the average value of X - the actual (measured) values, n - number of measurements.

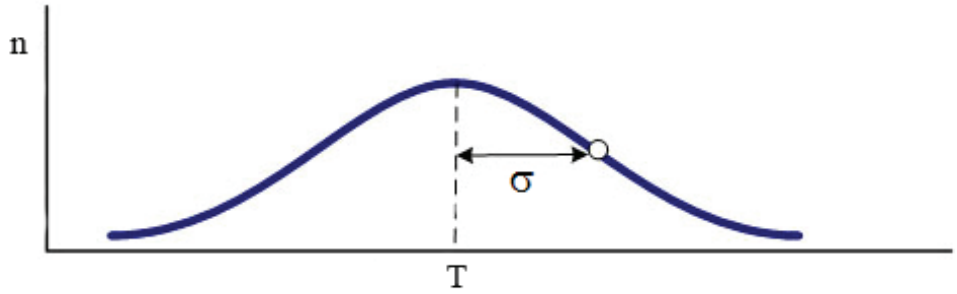

Fig. 1. Graphic representation of the standard deviation

Limits of quality as in any process are set lower and upper limit of control . This area within the control limits - as a region, all values of the process that fall outside the field of quality - the lack. In Fig. 2 shows an example of the limits of control the size of parts after processing.

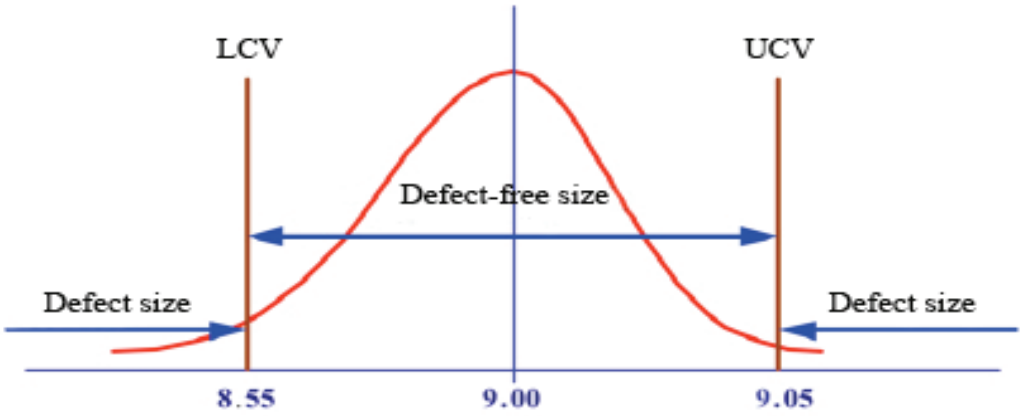

Fig. 2. Variability size details

LCV - lower control value (8.55 mm) UCV - upper reference value (9.05 mm)

By analogy may provide control limits for the characteristics of the learning process of the defined criteria, which, for example, may include:

- Number of subjects;
- The amount of subjects;
- The amount of practical training in the disciplines.

According to defined criteria are statistics by survey (any type) and build dependence data distribution (Fig. 3).

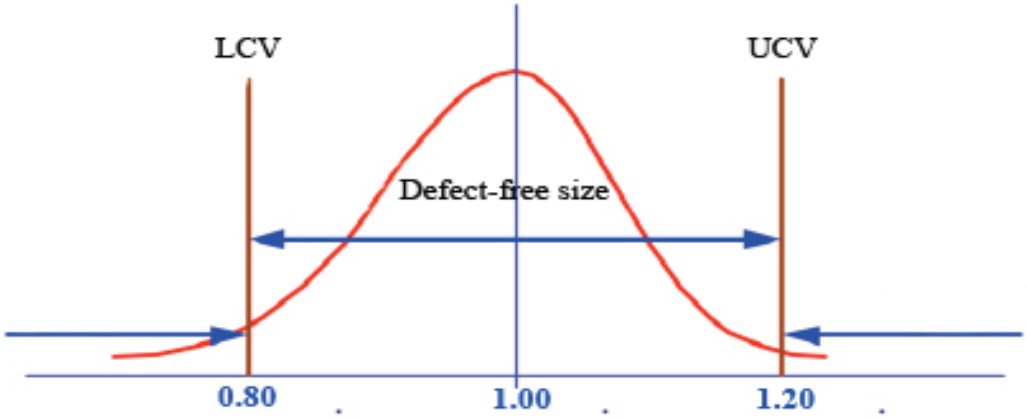

Fig. 3. Variability of theoretical material by discipline

For different conditions and characteristics of the process in the control area boundaries can fit different amounts of σ (sigma). Six Sigma chosen as the name of the method considering the quality standard, in which six standard deviations fit to the control limits on either side of the target (Fig. 4).

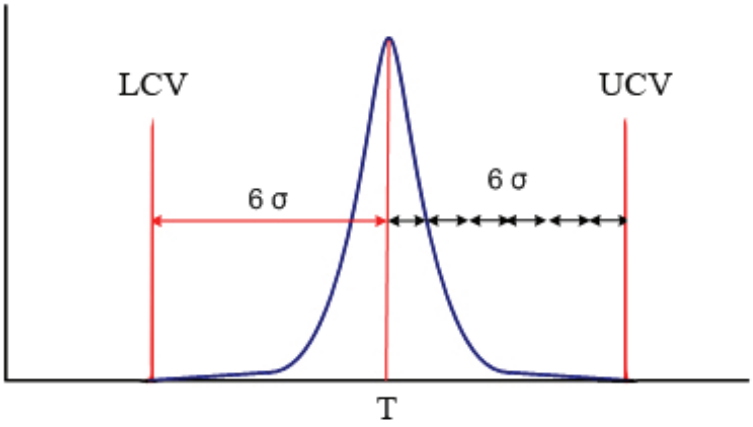

Fig. 4. The level of the "Six Sigma"

Thus the system can "Six Sigma" - statistic measure of how far the process deviates from the reference model.

If the process correspond to the level six sigma, it achieved the highest practical level without defectiveness - about 99.99966%. In other words, we are on both sides of the average stock in the "six sigma quality".

In actual practice among companies is the most common Level 3 to 4 sigma (up to 99.38% without defectiveness). In the event that the company strives to improve processes without defectiveness to "six sigma", the system of "Six Sigma" can be seen as an ambitious goal.

In the system of "Six Sigma" is a proven practice methods to improve processes and bringing them to the desired level without defectiveness. For example, the solution of problems and adjustment process is carried out strictly in the projective logic. Each project is clearly some time and resources. In addition, the implementation of the project via "Six Sigma" follows strict logical sequence of phases, defined by Deming cycle (PDCA): Planning - implementation - testing - fixes [4].

In this context, "Six Sigma" can be regarded as a universal cycle of improvement, which is reproduced.

Important in this case is identifying the key issues and ways of improvements.

One of the most effective methods and tools to identify problems is the method of Pareto improvements [5].

According to the Pareto principle, any defect is the result of a series of reasons, one or two of which act as dominant.

In the system of control of quality method Pareto used to determine the main reasons for marriage, leading to the most significant costs of production. According to Pareto 80% of costs accounted for only 20% of all possible causes, it is to find and focus their efforts.

In the daily activities of control and quality management constantly have various problems such as advent of shortage (in the education system - deficiencies of the educational process, curriculum, etc.).

Pareto diagram allows you to distribute efforts to address emerging issues and to establish the main factors of which must begin to act to address emerging issues.

There are two types of charts, Pareto:

A. Pareto chart for results of activity. Designed to identify the main issues and reflect unwanted results of activity related:

- quality (defects, errors, non-curriculum);
- a cost (expense);
- Dates (disruption studies, changes in schedule);
- safety (accidents, errors in workshops).

2. Pareto chart of reasons. Displays the cause of problems in the process and used to identify the main ones:

• Executive work (teacher): age, experience, qualifications, personal characteristics;
• Equipment: tools, office equipment, the organization uses models;
• Software - provider;
• Method of operation: techniques, sequence;
• other reasons.

Building a Pareto chart starts with classification problems arising from individual factors (eg, problems related to marriage, problems relating to the work of performers, etc.). Then provide collection and analyzing statistical material for each factor to determine which of these factors are abundant in solving problems. Then in a rectangular coordinate system on the horizontal axis lay at intervals that correspond to the factors and the vertical axis - the value of their contribution to the problem solved. This arrangement of factors such that the impact of each factor, located on the horizontal axis, decreases from the previous factor (or group of factors). The result is a chart, the columns correspond to individual factors that is causing the problem. Then based on this chart are building the cumulative curve.

In the event that necessary to conclude on which it forms a large number of detected irregularities (deviations of the process) you can find the problem of quality as arising during the process of transmitting bundle charts and Pareto analysis.

When data collection is used check sheet that includes information on the name of the process, type mismatch, the total number of discrepancies, the results of control of types of discrepancies.

Using Pareto charts to identify problems and causes of the most common method is the ABC-analysis.

The essence of ABC analysis in this context is to identify three groups of objects that have three levels of importance to quality management:

1. Group A - the most important, significant problems, causes defects. The relative percentage of group A in the total number of defects (reasons) usually ranges from 60 to 80%. Accordingly, elimination of group A has a big priority and related measures - the highest efficiency;

2. Group B - the reasons, which together have less than 20%;

3. Group C - the largest, but least important causes and issues.

As a result of the development of a chart consistently exploring the reasons discrepancies (how improvements) for more key objects using of cause-effect diagrams known as Ishikawa diagram [6], and after the corrective action again conduct an analysis of the object and its improvement.

The scheme is a system of vectors and characters, illustrating the relationship between cause and consequence of any event. With its help determine the causes of defects (nonconformities) that arise and outline ways to eliminate them.

Cause-effect diagram (Ishikawa diagram) is an effective tool for organizing and displaying various hypotheses that combine the potential causes of the consequences that arise. Chart based on a clear relationship between quality indicators and factors that affect them.

The result of the process depends on many factors, among which there are relations such as cause-result. You can define the structure or nature of the multivariate relationships through systematic observation. It is hard to solve complex problems, not knowing the structure, which is a chain of causes and results. Cause-effect diagram - a tool that allows you to apply this relationship in a simple and accessible form.

Cause-effect diagram does not indicate the exact cause of quality problems, but in the diagram indicates the possible causes that have an impact on the problem and the impact of a cause must be assessed during the joint discussion of specialists, such as group quality improvement, or between stakeholders. Quantitative evaluation by the measuring - the next step after passing the cause-effect diagram, when based on data from conclusion about the correctness of theoretical considerations, otherwise need to correct the primary cause-effect chart.

The best way to determine the amount of improvements selected problems are common to all the aspects of its service provider and the consumer defined acceptable limits [1].

This may be the most effective way for consistent achievement of defect level "six sigma".

Forecasting quality of the process must take into account the statistical probability distribution (middle square deviation σ) by criteria, and then proceed to implement management of process and control through the use and improvement of appropriate internal standards [7].

At a higher level of compliance reduces the number of nonconformities (defects), corrections and improvements, which generally leads to lower costs and increase process efficiency. In addition, if the quality process complies with consumers, therefore increasing the consumption of services creates an additional effect - economies of scale.

Japanese quality management experience shows that effective management processes improves the degree of compliance, reduce the number of defects and rework until their complete elimination in the end leads to a decrease in cost of goods (services).

Conclusions. The "Six Sigma" - a modern management system that aims to improve grand performance of the organization (company) to profit by reducing costs and meeting customer requirements.

The system provides project style of management, team working methods, the principle of planning competence, leadership, continuous improvement, integration of statistical methods and quality management methods.

Effective management of granting of educational services on the way to "six sigma" linked to the organization and a set of measures, the effectiveness is confirmed by international experience:

1. setting goals and objectives (Strategy) institution;
2. determine ways to achieve goals;
3. definition and coordination with consumers criteria for evaluation of educational activities;
4. test results of the process (should be monitored all the causal factors);
5. implementation of appropriate controlling influences (corrective actions implemented and verified their results).

Thus, implementation methodology "six sigma" in the process of providing educational services by educational institution is a long term problem that must be achieved by successive stages of improvements, including organizational, managerial and scientific and methodological problems.

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V. Shpylovyi, Ph.D. (Technical Sciences) (National Aviation University, Ukraine),
T.Shpylova, Ph.D. (Technical Sciences) (National Aviation University, Ukraine),
M.Zakharenko, D.Sc. (Phys.&Math.) (Taras Shevchenko national university, Ukraine),
V.Kobko, Ph.D. (History). (Institute of Public Administration for Civil Protection,Ukraine)

FORMATION OF THE TRAINING SYSTEM FOR SPECIFIC MASTER CATEGORIES IN UKRAINE

The direction of training in specific categories by the master and specialist education &qualification levels has been opened in the educational system of Ukraine at the end of the 20th sentury. The basic branch education and additional competences gained in a process of training by specific educational categories, which possesses no branch features, permit the graduands to implement effectively the modern technologies and business projects at the enterprises and in the scope of services.

Modern level of the social evolution requires a new generation of the manager of innovation systems. Training of the personnel for management activity stipulates a series of the urgent pedagogical tasks, which should be scientifically justified.

Currently, not only the implementation of modern technologies, but also the availability of workmanship in personnel management and innovation projects, the gaining of the understanding with employees and the providing of an effective labor management are the most important trends in human activity.

Here, "training" is considered as a general term that is used with respect to the applied problems of education. It means the acquiring of the social experience for its further application in solving the special problems of the applied, cognitive or educational type. This term is considered in two meanings: training itself – the formation the abilities for solving the future problems and the availability – the presence of competences, knowleges, abilities and skills required for solving the assigned tasks.

The specific features of the activity in the field of innovation development management and the complexity of this kind of activity promoted the formation of peculiar conceptual background of the personnel training.

Evidently, the training system of such kind of the specialists should provide the rapid modification of the content of education and the content of training according to the both anticipated and arised changes in the implementation of the innovation activity.

Such kind of the training system provides the correspondence of the educational and training content with the problems of the project-innovation activity. It provides the acquirement of the specialists' ability to realize the principal actions and to solve the problems concerning the implementation of the project-innovation activity.

The significant factor providing the appropriate quality level of the specialist's qualification is a concordance with the European Qualifications Framework (EQF). EQF is an integrated qualification system, its parameters being specified both at the internal and intenational level. This system provides the evaluation (determination) of the training results and its interrelations. The latter reflects, in fact, the ability (competence) of a person to confirm the personnel capacity to exhibit in practice the acquired knowleges, abilities and skills. This, in part, involves the evaluation of the educational diploma and certificates for the citizen of the countries passing the evaluation procedure of the national qualification framework with respect to the compatibility criteria with the EQF requirements.

Special attention should br paid to the realization of the professional training on the base of the competence approach. In this course the training envisages the requirements to the knowleges, abilities and skills, which permit the person to perform successfully the principal actions and to solve the problems regarding a certain profession concerning the implementation of the project-innovation activity.

The training is realized according to the professional standards, which are commonly established for a professional group (professional titles of works or appointments) within a certain field of professional activity.

The structure of the professional standards provides the professional (trade) activity being divided into the separate structural elements – principal trade functions and actions (tasks and actions) while the requirements to knowleges, abilities and skills of an employee are specified for each of them.

The professional standards form a background for the procedure of attestation and certification of the personnel, which evaluate the rate of the professional ability (competence) to perform a certain function or a set of functions, etc.

According to the rating matrix for the complexity of the project-innovation activity, three categories of specialists have been defined (Table 1).

Table 1

Categories of specialists

Scale	Mark	Interpretation of marks	Category	Interpretation of categories
1 4	1 2	the lowest low	extra-categorial	-
11 23 40	3 4 5	insignificant moderate below the medium	PIC3	business innovation
60 77 89	6 7 8	medium above the medium essential	PIC2	recsearch and development innovation
96 99 100	9 10 11	significant high the highest	PIC1	global innovation

The category specifies the competence level (permanently confirmed ability of the person to perform the activity in an appropriate manner according to the formal requirements) of the project managet and project team for the management of the project-innovation activity.

In 1997 the authors of this paper have initiated the creation of a new group of specialties – specific categories. The training by these categories has been realized on the base of higher education (the master's and specialist's education&qualification levels).

The experience gained during a large-scale introduction of the innovation technology and our further theoretical findings have been used in the creation and implementation of the branch standard of the master's and specialist's training by the speciality "Project and program management", textbooks with the stamp of the Ministry of education and science of Ukraine "Formation, management and development of the project team", "Innovation development of the industry in Ukraine" and other methodological manuals in the field of project management.

The list of specialities by specific categories in 2001 contained ten specialities (Fig.1), among which only four ones could be considered as those possessing no branch features, namely, "Quality, Standardization and Certification" "Project Management", "Intellectual Property" and "Administrative Management". During the following decade a number of such specialities become as twice as higher that evidences for the necessity of the existence and development of the specific categories' specialities.

A number of the institutions of higher education in the field masters' and specialists' training by specific categories steadily increases. This number increases in 2.7 times during the last seven years or by 15-17% per year (Fig.2). Currently, a quarter of the

Ukrainian institutions of higher education of the IV-th accreditation level accomplishes the master and specialist training by the specialities of specific categories.

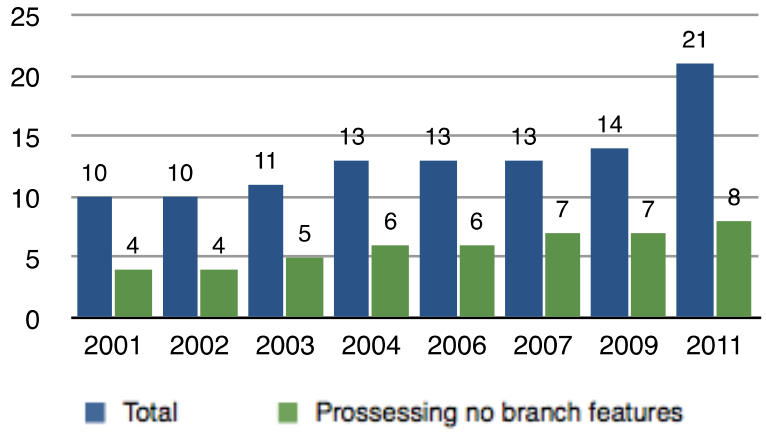

Fig.1. A number of specialities by specific categories

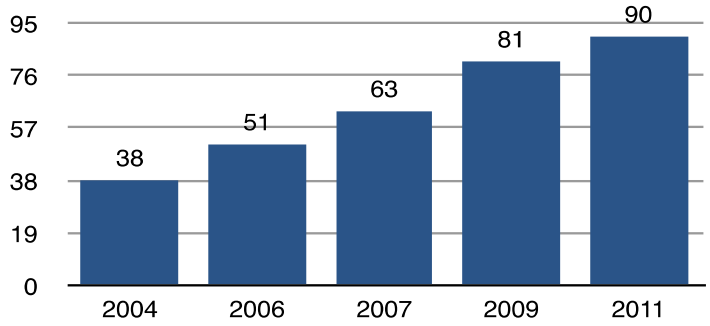

Fig.2. A number of the educational institutions engaged in training specialists by specific categories

The dynamics of the increasing of a number of graduands by specific categories during 2001-2011 presented at Fig.3 directly evidences for the considerable increasing of such specialists requirements.

The total amount of graduands by specific categories specialities and by specialities possessing no branch features increased in 12.5 and 13.3 times, respectively, during the last 11 years, whereas that for the other specialities the appropriate increasing was as high as 10.5 times. This means that the development and implementation of a new set of specialities is exceedingly required and topical problem both at educational and labor-markets in Ukraine. This especially concerns the specialities of specific categories possessing no branch features, similarly to the technologies of the sixth economic cycle, are now demanded in many branches of economical activity.

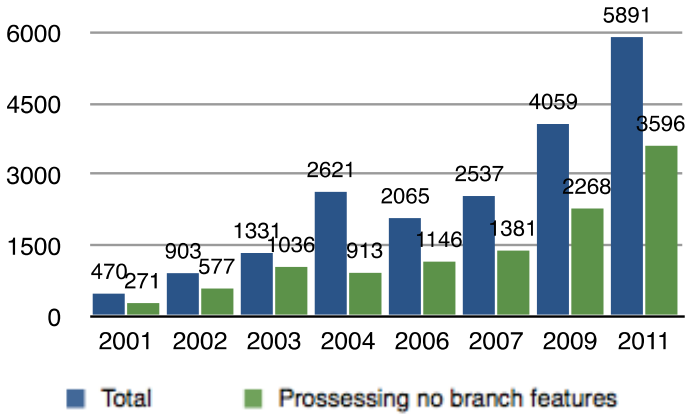

Fig.3. A number of graduands by the specialities of specific categories

Let consider in more details the variation of the demand on each speciality possessing no branch features during 2001-2011 (Fig.4).

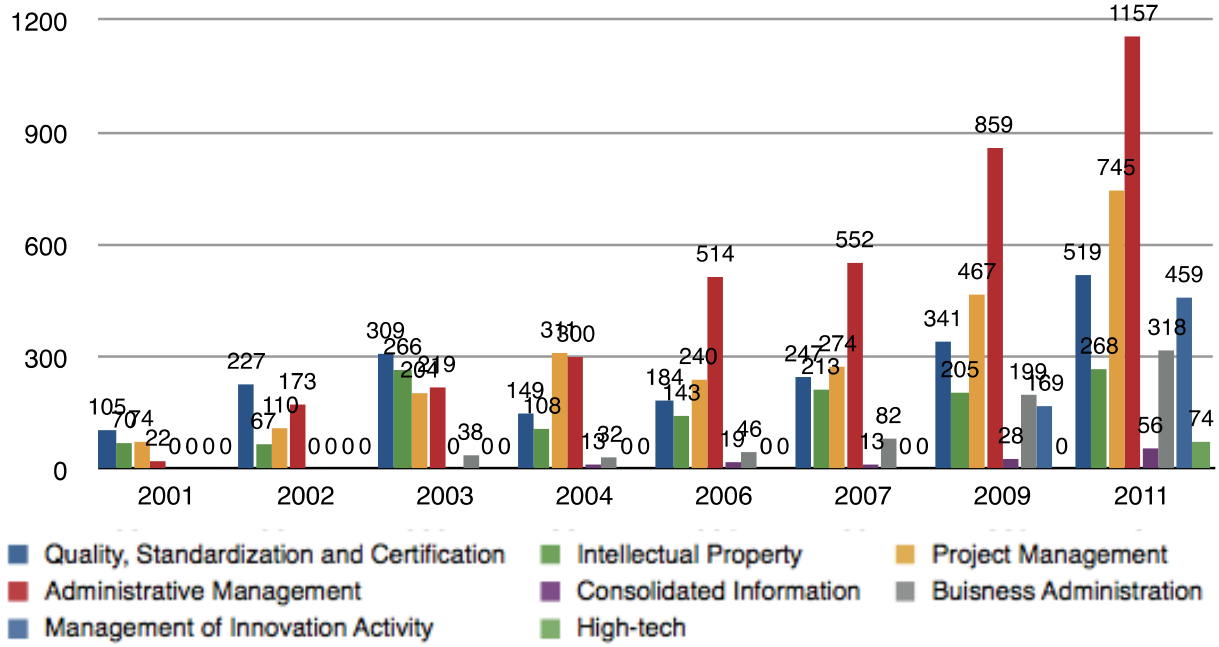

Fig.4 The dynamics of a number of graduands by the specialities of specific categories possessing no branch features

Evidently, the following specialities existing during the total period under consideration are seen to the most successful: "Administrative Management" (1157 graduands in 2011), "Project Management" (745) and "Quality, Standardization and Certification" "(519). It should be specially emphasized an extensive increasing of the interest in the speciality "Management of Innovation Activity" during last five years. During 2009-2011роки a number of graduands by the speciality "Management of Innovation Activity" have increased in 2.7 times and was equal to 459 persons in 2011.

The increasing of graduands by the specialities "Intellectual Property" (268) and "Business Administration" (318) is evidently quite reasonable. The development and growth of the speciality "Consolidated Information" (56 graduands) is seen to be the most gradual. It is possible to make only preliminary conclusion regarding the speciality "High-tech" that was organized in 2010. Nevertheless, 74 masters in high-tech in 2011 evidence for a successful start of training in this field.

So, one can state a successful result of the masters' specific categories training implementation in the educational system of Ukraine.

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I.V. Ivanova (National Aviation University, Ukraine)

SOCIAL RESPONSIBILITY OF UKRAINIAN UNIVERSITIES

The paper reports findings from a survey of CSR education in Ukraine and a survey of social responsibilities, which can be called "University Social Responsibility (USR). For Ukrainian universities, there is a requirement to contribute to the promotion of CSR, resulting in graduates who have sufficient cognition of and a good attitude towards CSR. Explore the ways Ukrainian universities may interact with societal demands and community engagement (stakeholders).

Although, Corporate Social Responsibility (CSR) is mainly promoted by large companies, mainly multinational enterprises, it is also important for other type of organizations such as universities. Its wider application towards Universities is of central importance, since they are the greatest contributors for the formation of forthcoming entrepreneurs, business leaders, managers and employees.

The new challenges of CSR raise the motivation and engagement for organizations, especially Universities so they can acquire skills and competences to develop appropriate CSR initiatives.

Universities create and dispense knowledge - this is their fundamental, time-honored mission. They thus contribute to society in vital and complex ways. It is through universities that graduates can be equipped with the knowledge, skills and concern to address a range of social, economic and scientific challenges: the energy crisis, the impact of climate change, food insecurity, health and the search for sustainable alternatives in all economic sectors.

In the context of the United Nations' (UN) Decade of Education for Sustainable Development, Universities are presented as development levers for training and promoting a collective awareness about the need for growth, in a sustainable basis. Bologna Process has setting goals and priorities. The Higher Education European Area can contribute towards the achievement of education for all, that should be based on the principle of sustainable development.

For universities, there is a requirement to contribute to the promotion of CSR, resulting in graduates who have sufficient cognition of and a good attitude towards CSR. In addition, universities have social responsibilities, which can be called "University Social Responsibility (USR)."

USR, understood as "a policy of ethical quality for the university community performance (students, teachers and administrative personnel) through responsible management of the educational, cognitive, labor and environmental impacts that the university generates, in a participative dialogue with society to promote sustainable development" represents an opportunity to rethink and analyze the role of the university. It is for that reason that public universities (and some private) have initiated a clear and active discussion and reflection on USR as a strategy to begin the transformation towards management that is committed to social capital and human, sustainable development. The objective is to undertake efforts that link teaching and research to social participation.

USR has been incorporated in the universities' organizational philosophy and become one of the core activities and commitments of the higher education sector.

USR is also an interactive process, which embraces their stakeholders on a voluntary basis.

The stakeholders of a university include present students, future students and corporate supporters, among many others. Universities behave like large corporations and demonstrate responsibility for stakeholders and society as a whole. The are seven strands that make up USR (including organizational governance, student issues, community involvement and the environment) and conclude that developing strategies around all of these can help universities create an understanding of their role in their communities and help them manage potential conflict.

One large stakeholder group is present students, most in the age range of 18 – 25. They are also among the most interested in understanding the social action of organizations and they have

little patience for those who do not do so with transparency and integrity.

Another group of potential stakeholders are future students. Prospective students are interested not just in the academic reputation of the university, but also in the character of the institution. Incoming students are drawn to institutions that reflect a culture of social responsibility. It makes a difference in terms of selecting a university.

That USR can help an institution develop a competitive advantage and stand out from its competitors. Universities realise that it is a competitive market in terms of creating an ongoing stream of satisfied alumni, attracting new students and addressing the concerns of business supporters, a strategy which incorporates CSR is a start.

The implementation of USR in an university requires a systematic, methodical, transversal, and especially strategic approach, for the whole organization.

*Universi*ties can meet the expectations of stakeholders by adopting a well-conceived CSR strategy in the same manner as other organizations. The same principles of strategic management apply to incorporating USR as part of competitive advantage: formulation, implementation and evaluation. Established management tools, such as the Balanced Scorecard, can provide a framework for this process.

In Ukraine, social responsibility in general and USR in particular have only just begun to reveal their potential to transcend the philanthropic notion and become an area of cooperation between multiple actors in development. This allows for solutions to emerge to the main problems or economic, social, and environmental gaps in the global and national economy.

There are several reasons why social responsibility of Ukrainian universities is very important. First, because of continuously diminishing state funds for the sector, higher education is increasingly being regarded as a private good. It must be recognized that it is essentially a public good. That does not mean that the state must provide all the funding; but the state has the responsibility to plan and regulate the sector.

Transposed in terms of the Ukrainian universities, this social responsibility suffers from several shortcomings.

Higher education in Ukraine is increasingly regarded as a commodity or a tradable service, not all the providers act fairly or ethically.

Today, education faces the mounting challenges of strained budgets, teacher retention, and global workforce competition. ,

Because of crisis in their funding, Ukrainian universities are being run as corporate entities, the main objective being to generate income to cover costs, at times at the expense of quality or even ethics. Large numbers of private, for-profit, and business-oriented higher education institutions now exist, and are on the increase. Generally, universities are adopting a short-term, market-driven approach, ignoring long-term visions and challenges of society

With improved technology, fraud and deception in higher education are on the increase, e.g. fake diplomas which can be purchased online and false accreditation bodies.

Ukrainian universities have so far managed a weak transmission of knowledge with regard to employability. This is a consequence of the gap between content and programmes, but also real needs in terms of skills.

Plagiarism in research papers and even in PhD theses is becoming more common.

Education should not to be governed solely by market demand; considering the long-term needs of society is equally important. It outlines why universities in Ukraine should move forward in determining the most relevant paths for social responsibility engagement and initiatives; second, it provides an understanding of the setting of CSR, making it easier for graduates to implement CSR at the organization they work for in the future.

The major goal of the education is stimulating institutional forms of CSR and business ethics development in Ukraine via arranging studying, consulting, holding researches, preparation of publications, and methodological recommendations.

In 2009 the Global Compact Network Ukraine with the support of Ukrainian Association for Development of Management and Business Education set up a working group for implementation

of CSR principles in Ukrainian higher education.

In 2010-11, by present the following activities were carried out: development of the "Corporate Social Responsibility" (CSR) course and methodological materials for teaching at undergraduate level (the Bachelor curricula); and Recommendations on how to develop CSR competences in Ukraine's education system for students majoring in any area; two Summer Institutes for lecturers' professional development; round tables devoted to the implementation and promotion of the CSR program, competition on the best curriculum for the CSR course, publication and report of the findings of research conducted; presentation of the "GC Dilemmas" business game, etc. - to promote CSR discipline into Ukrainian universities. Also, the CSR course is taught for Master's degrees that students take as their post-grade second higher education.

As a result, more than 50 universities in Ukraine included CSR into their curricula, more than 100 lecturers took training on CSR and over 5,000 students attended the CSR course. "

The working group also contributed to the development of CSR Manager job description as a professional standard covering core competences of future specialists, The title of CSR Manager has been included into the national job classification.

This will ensure common understanding of the principles of corporate responsibility and sustainability in the academic community and train a new generation of managers aware of how CSR makes better business

Reforming Ukraine's education system is an increasingly important issue on the national agenda as far as for the country's successful development and its ability to compete in modern economy depend on the quality of education of its citizens.

It can be said that the society of tomorrow begins today, and to make up this society, Ukraine's universities need to have drive, patience, and persistence to help them achieve the related goals. It is crucial for learning institutions to develop ways in which to cope with the present context demands, not only in terms of returns to the community in the form of community engagement involvement through student projects, but also in the sense of replenishing their own actions and enlarging their sources or references, so as to become institutions that help with and are partially involved in shaping a new society that is more ethical and is engaged with its community and surroundings. .

A guiding principle that should be used by Ukraine's universities is that they exist not only for the elite and for those who can afford to pay, but for all members of society who have the academic ability and the desire to pursue higher education. First of all, universities have to ensure equity of access and success for minority groups such as the physically-challenged and the under-privileged.

It is important that the Ukrainian universities will not use false and deceptive propaganda and advertisements to lure students. The tuition fees they charge must be reasonable and they must take into account the local values, cultures and priorities in higher education.

Ukraine's universities need to assume a special importance in promoting a collective strategy for growth in a sustainable basis, throughout the development of an adequate educational offer and scientific research, in the scope of social responsibility and sustainable development.

A key element of a university is to craft an overall strategy and then determine the various categories to be measured and then develop benchmarking capabilities. A strategic action plan will enhance the Ukrainian universities's performance potential. A strategic plan will also embrace transparency and indicate to stakeholders that specific steps are being taken to address social concerns.

Ukrainian universities have the freedom to decide whether or not to teach themes such as social responsibility and sustainable development. They should also not ignore the norms and guidelines of organisations such as UNESCO, UNDP and EU, since they are in fact key players in promoting CSR through social marketing, for a better and sustainable society and economy.

Finally, it is with our institutions of higher education that the responsibility falls to oversee development and innovation in new technologies. These technologies may hold the answer to some of the world's current global challenges, but this will require that students are equipped with the appropriate ethical and entrepreneurial skills. .

Ukraine's universities also need to address global challenges such a climate change, poverty, water, food security and health. To promote world peace, universities must instill in students an understanding and appreciation of diverse cultures, the desire to assist those less fortunate and the will to make the world a better place to live. .

In all professional courses, students should be made aware of the environmental and social impacts of their professions. Arriving at solutions to most of the global sustainable development challenges requires an inter- or multi-disciplinary approach, and yet most Ukraine's universities, in their teaching and in the way they are structured, adopt a single discipline approach. There is therefore a need to promote a multi-disciplinary approach.

CSR should be a compulsory subject in every Ukrainian university taught with high quality and in an interesting way. Through this approach, a new generation of professionals in different areas will appear. They will understand the importance of social responsibility for the social development, and thus, necessary results will be achieved in the shortest term: more Ukrainian companies will integrate the principles and standards of social responsibility into their day-to-day activity..

There is a need for creating awareness of global sustainable development challenges among students; and encourage them to “think globally, act locally”.

All curricula should have an international dimension embedded within them. Multi-cultural understanding is also very important. One of the ways of achieving this is to encourage student exchanges

Also for Ukraine's universities is necessary the activity on forming corporate culture in Ukraine according to the ethical values and the CSR highest standards as a part of general business strategy of modern enterprises development via educational programs, trainings and their methodological support; holding problem seminars and trainings adapted to realistic circumstances of running business in Ukraine.

But first of all, Ukrainian universities should promote a true culture of CSR throughout their organizations. Also, universities should develop social marketing actions in order to better communicate and interact with stakeholders. The development of a vibrant CSR culture will foster the build-up of human and social capital.

Often businesses and the Ukrainian education system work together only to support talented youth, give opportunities to take internships and cooperate for staff development. However, the involvement of employers at the decision-making stage and their engagement in the process of reform and curriculum development is becoming very important. It is business and the real needs of the labor market that determines the actual requirements for specialists and their hands-on skills and knowledge. The effective partnership between employers and educational sector may help to bridge the gap between the quality of education and actual market needs.

The Ukrainian university’s interaction and connections with business sector management need to be improved. It is neccessary to find the ways to improve the practical value of knowledge and skills gained by students at the Ukrainian universities from the perspective of the real economy sector by getting all stakeholders together to discuss in an open forum the needs of both Ukraine's universities universities, students and employers and to help develop the pathway for future reforms through this dialogue.

The aim is to promote dialogue with the business sector by initiating discussion between alumni groups and faculties. Through the alumni associations, faculties can obtain information for their curriculum planning about the skills employers expect recent graduates to possess.

Ukrainian universities need to ensure effective information exchange among all stakeholders (universities with community, industry and the governments). The joint efforts and cooperation of the government, universities and employers are key to effective reforms of the education system. The government is certainly the main driver of changes. In turn, Ukraine's universities need to react quickly to the changing economy and technology and deliver the specialists who have professional knowledge and skills to succeed in the new environment, which requires increasingly more from graduates.

By promoting sustainable development practices in the management of their campus, Ukraine's universities can demonstrate their commitment to social responsibility. They can, for example, introduce energy-saving measures and promote the use of renewable energy sources on campus. They can equally encourage the reduction in the use of paper and other materials and arrange for recycling their waste products. Generally, they can help to create a pleasant, healthy and safe campus environment for their students and staff. They should also practice consultative, fair, transparent and accountable management. Above all, by ensuring that students participate fully in all the above processes, universities can instil in them a sense of social responsibility.

Ukrainian universities' commitment towards the community needs to be fostered, going beyond their contribution to innovation. Knowledge-sharing with society through interaction and permanent dialogue with civil society organisations, such as schools, museums, charity foundations, etc. has to be enhanced to address societal needs.

Students form an enormous pool of valuable resources for assisting communities served by a university. Undertaking community-based activities promotes a sense of civic responsibility in students and enables them to become socially responsible citizens.

Finally, at all times, Ukrainian universities should ensure quality of their higher education provision.

Conclusion

In fact CSR is a new challenge for Universities. University social responsibility (USR) has a specific content in function of a concrete context in which a university institution is inserted and under the framework of complex problems, but historically and socially defined.

Some blend of the ideas inherent in CSR and older ideas of higher education as a social good can be used to drive and direct a more coherent, cogent further education strategy in the Ukraine.

The are many ways in which a university addresses the concerns of myriad stakeholders with respect to CSR.

Because universities train future leaders and decision-makers, it is incumbent on them to ensure that their students become socially responsible citizens. Ukrainian universities must resist the wave of commercialization and commoditization. Responding to short-term market demands must not be their sole mission – they also have a responsibility to cater for long-term societal needs.

In order to provide society with graduates with the right skills required for the labour market, Ukraine’s universities have to provide an ethical knowledge base, responsive to the social needs.

Concepts of ethics and social responsibility need to be introduced everywhere in the teaching and learning process.

USR is a strategic opportunity and a commitment to build a better society.

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O.M. Savinov, Ph.D., L.I. Vdovenko (National Aviation University, Ukraine)

MATRIX'S MODEL OF DYNAMICS OF KNOWLEDGE, SKILLS AND ABILITIES PILOTS

Proposed model, that separately take in account parts of training process, that directed to acquisition of separated parts of knowledge, skills and habits. Model is maximally oriented for computer implementation.

Problem. Effective fulfilment of aviation tasks require reliable providing of air safety, this is based on the appropriate level of training of aviation professionals. Relevance of the problem are proved by relevant regulations [1]. The problem is the lack of instruments for grounding regulated documents or in their lacking of illustrative facilities and persuasiveness. The absence (or imperfection) of these instruments does not allow to build the best strategy for training of aviation professionals including pilots.

Analysis of recent research and publications. In previous publications of the author there was proposed logistic model-level skills and fitness for flying training of pilots [2]

$$\begin{cases} \dfrac{dy_L}{dt} = k_L(y_L - d_L)(a_L - y_L) \\ \dfrac{dy_T}{dt} = k_T(y_T - d_T)(a_T - y_T) \\ \dfrac{dy_{Tm}}{dt} = k_{Tm}(y_{Tm} - d_{Tm})(a_{Tm} - y_{Tm}) \end{cases},$$

where y_L, y_T - level skills that are achieved through appropriate flights training and training on simulators, k_L, k_T, k_{Tm}, d_L, d_T, d_{Tm}, a_L, a_T, a_{Tm} - coefficients, t-time. The model considers the negative impact of training on simulators in the absence of real impact of external factors. The disadvantage is the lack of separation already existed knowledge on skills, abilities and knowledge, such as was done in the work [3]

$$\begin{cases} \dfrac{dY_K}{dt} = A_1 + (A_0 - A_1)Y_K - A_0 Y_K^2 \\ \dfrac{dY_S}{dt} = B_1 Y_K + (B_0 - B_1)Y_K Y_S - B_0 \\ \dfrac{dY_H}{dt} = CY_S Y_H \end{cases},$$

where Y_K, Y_S, Y_H - relative volumes of knowledge, skills and abilities, normalized relative to maximum possible quantities; A_1, B_1 - coefficients of speed of development of knowledge, skills and abilities accordingly; A_0 - coefficient of memory (the difference of speed of memorization and forgetting); B_0 - constant of ingenuity that characterized by the speed of usage of information (knowledge) to solve a particular problem; C - permanent of fixing skills.

The advantage of the model is taking into account the impact of knowledge on the formation of skills and impact of abilities on the formation of skills. The disadvantage is the consideration only some mutual influences between Y_K, Y_S, Y_H and not quite the correct definition of the coefficients of the first equation of system. Also, do not identified (and instead of this, the averaged) positive and negative components of training. The main drawback is that the share of the processes that the for theirs content should be limited on the level of development, described by exhibitors without limit of growth. Application of this model is acceptable only in case if the process forced out of the bounds, making it difficult to model and leaves the preconditions violation of adequacy.

In [4] proposed a model that combines the advantages and eliminates disadvantages of the

above models

$$\begin{cases} \dfrac{dY_K}{dt} = C_K \cdot (\beta_K^K Y_K + \beta_K^S Y_S + \beta_K^H Y_H - d_K)(a_K - Y_K) \\ \dfrac{dY_S}{dt} = C_S \cdot (\beta_S^K Y_K + \beta_S^S Y_S + \beta_S^H Y_H - d_S)(a_S - Y_S) \\ \dfrac{dY_H}{dt} = C_H \cdot (\beta_H^K Y_K + \beta_H^S Y_S + \beta_H^H Y_H - d_H)(a_H - Y_H) \end{cases}, \quad (1)$$

where C_K, C_S, C_H - coefficients of speed the development of knowledge, skills and abilities; β - weighting coefficients of the mutual influence of knowledge skills and abilities; $d \geq 0$, $d + a$ - lower and upper asymptotes corresponding logistic equations. The equations are took into account that the higher level already acquired knowledge, skills and abilities, the faster new knowledge, skills and abilities will be acquired. In matrix form equation presented in the form

$$\frac{dY}{dt} = C .* (\overline{B}Y - D) .* (A - Y), \text{ where } B = \begin{vmatrix} \beta_K^K & \beta_K^S & \beta_K^H \\ \beta_S^K & \beta_S^S & \beta_S^H \\ \beta_H^K & \beta_H^S & \beta_H^H \end{vmatrix}; \quad (2)$$

Y, C, D, A - vectors - columns; $\overline{B}$ - the normalized matrix B, $\overline{\beta}_j^i = \beta_j^i \cdot \left(\sum_{i-\overline{1,n}} \beta_j^i \right)^{-1}$, $\sum_{i-\overline{1,n}} \overline{\beta}_j^i = 1$, $j = \overline{1,n}$, n - size of square matrices B, $\overline{B}$ (Next we will only use the normalized weighting coefficients, which for multiplicity will denote without the underlining B); $.*$ - operator elementwise of matrix multiplication. Joint action of knowledge, skills and abilities formalized additive convolution, which provides the maximum compensational possibilities adjacent factors. In fact a very common situation where the absence (equality to zero or disparagingly small size) at least one of the factors of influence leads to total nullification of all joint influence on the right part of the differential equation. In this case, more relevant and other types of convolutions. In addition, the model does not provide that each of the three components (knowledge, skills and abilities) should be divided into its components, which can also have arbitrary nature of the clotting.

The investigation aims to improve the level of models of existing knowledge aviation professionals including pilots in the direction of more detailed consideration of the internal structure of knowledge, skills and abilities, taking into account diversity of possible types of theirs interaction.

The main material.

Us represent the equation system (1) in summary form more suitable for further Machinery simulation

$$\frac{dY_i}{dt} = C_i \cdot (\beta_i^1 Y_i + \beta_i^2 Y_i + \beta_i^3 Y_i - d_i)(a_i - Y_i), \; i = \overline{1,3} \quad (3)$$

де Y_1, Y_2, Y_3 - relative amounts of knowledge, skills and abilities, normalized for relative to satisfactory the normative values [4] indexes 1,2,3 of indicate the coefficients and variables which correspond to knowledge, skills and techniques accordingly. This formalization facilitates the transition to the matrix form of record (2). But it would be really possible if the value Y_1, Y_2, Y_3 would be completely independent, that is completely adequate would be additive convolution values. In reality, there are also additional effects from the joint action of various factors. Depending on the peculiarities of specific of educational disciplines equation (3) can evolve into the type

$$\frac{dY_i}{dt} = C_i \cdot (\prod_{j=1}^{3} Y_i^{\beta_i^j} - d_i)(a_i - Y_i), \; i = \overline{1,3}, \quad (4)$$

which to a greater extent takes into account the interdependence of knowledge, skills and abilities Y_1, Y_2, Y_3, or into the type

$$\frac{dY_i}{dt} = C_i \cdot (\sum_{j=1}^{3} \beta_i^j Y_i + \prod_{j=1}^{3} Y_i^{\beta_i^j} - d_i)(a_i - Y_i),\ i = \overline{1,3}, \quad (5)$$

which according to degree of interdependence between of knowledge, skills and abilities, placed between the variants (3) and (4). Large proportion of equation (5) $\sum_{j=1}^{3} \beta_i^j Y_i + \prod_{j=1}^{3} Y_i^{\beta_i^j}$ is reduced polynomial Kolmogorov-Gabor specially for which V.H.Lapa showed by numerical modeling that "the accuracy of the model is not reduced significantly if the generalized Kolmogorov-Gabor polynomial keep only linear terms and the last member" (covariance of the order which is equal to polynomial) [5; 6, p.201]. But the knowledge, skills and abilities are not interact with each other but only in a holistic way. Interaction is based on the level of individual components of knowledge, skills and abilities.

On the other hand, the construction of complete detailed matrix interactions are labor-intensive task, that is contrary to the requirements of efficiency of problem solving definition strategies of training. If the problem will be solved too long, its decision may be irrelevant.

For example, under the Rules of issuing certificates of the personnel of the maintenance of aircraft (Part-66) [7] claims to knowledge are 4-5 hierarchical levels (Table 1), and total such modules 17: 1. Mathematics 2. Physics, 3. Fundamentals of electrics, 4. Fundamentals of electronic equipment, 5. Digital technology / electronic instrumental system 6. Materials and aircraft equipment; 7. Practice maintenance 8. Fundamentals of aerodynamics, 9. Human Factors, 10. Aviation Legislation, 11a. Aerodynamics, structures and systems of aircraft gas turbine engines; 11b. Aerodynamics, structures and systems of aircraft with piston engines, 12. Aerodynamics, Structures and Systems helicopters, 13. Aerodynamics, structures and systems of the aircraft; 14. Power plant, 15. Gas turbine engine 16. Piston engine 17. screw.

Table 1.

An example of the internal structure of modules of theoretical knowledge of technical personnel for maintenance of aircraft

2. Physics
2.2. Mechanics
2.2.3. Dynamics
(a)
Mass
Force, inertia, work, power, energy (potential, kinetic and total energy), thermal, efficiency
(b)
Inertia and preservation of inertia
Impulse
Gyroscopic principles
Friction: nature and effects, coefficient of friction (resistance skating)
2.2.4. Hydrodynamics
(a)
Specific weight and density
(b)
Viscosity, resistance to fluid, flow around effects
The effects of fluid compression
Static, dynamic and total pressure: Bernoulli's Theorem, Venturi tube

A similar situation regarding abilities and skills of pilot of multy crew, which qualifications specified by regulatory units also have several levels of hierarchy and nine basic qualificational units [8]: 1) using the principles of management factors dangers and errors, 2) ground and pre-flight operations 3) take-off, 4) climb, 5) cruising flight, 6) lowering; 7) Approach to landing, 8) landing, 9) after landing and after flight operations.

With so many components are practically realizable level of detail of knowledge, skills and abilities not more than 1-2 levels of hierarchy depending on the specific type of training (academic

discipline). The main costs of time and effort going to prepare the input data. Therefore, organizing input (aggregation and decomposition) can have a decisive influence to the success of solving the problem. For this will extend the matrix of weight coefficients (2) taking into account detalisation of knowledge, abilities and skills and will present it in block form

$$B = \begin{vmatrix} B_{1,n_K}^{\overline{1,n_K}} & B_{1,n_K}^{\overline{n_K+1,n_K+n_S}} & B_{1,n_K}^{\overline{n_K+n_S+1,n_K+n_S+n_H}} \\ B_{n_K+1,n_K+n_S}^{\overline{1,n_K}} & B_{n_K+1,n_K+n_S}^{\overline{n_K+1,n_K+n_S}} & B_{n_K+1,n_K+n_S}^{\overline{n_K+n_S+1,n_K+n_S+n_H}} \\ B_{n_K+n_S+1,n_K+n_S+n_H}^{\overline{1,n_K}} & B_{n_K+n_S+1,n_K+n_S+n_H}^{\overline{n_K+1,n_K+n_S}} & B_{n_K+n_S+1,n_K+n_S+n_H}^{\overline{n_K+n_S+1,n_K+n_S+n_H}} \end{vmatrix}, \quad (6)$$

where n_K, n_S, n_H - the number of components of the curriculum that are intended for forming of knowledges, skills and abilities accordingly. For reduction separate matrix blocks marked as $B_{To\_Begin,To\_End}^{\overline{From\_Begin,From\_End}}$. Here and further the upper indexes ($From$)indicate the changeable that impact on the lower indexes (To) - changeable for which there is an influence, $Begin$, End - according to initial and final numbers of the relevant indexes. Upper lining means that the corresponding block matrix as an index turns moving all natural numbers in the range from defined by the initial to the final numbers (від To_Begin до To_End або від $From\_Begin$ до $From\_End$). To show contents of the mutual influences of the blocks of matrix it can be presented as $B = \begin{vmatrix} B_K^K & B_K^S & B_K^H \\ B_S^K & B_S^S & B_S^H \\ B_H^K & B_H^S & B_H^H \end{vmatrix}$.

Also this symbol indexes correspond to the indications of equation (1).

Blocks of the first row of the matrix are revealed so:

$$B_K^K = B_{1,n_K}^{\overline{1,n_K}} = \begin{bmatrix} \beta_1^1 & \beta_1^2 & \dots & \beta_1^{n_K} \\ \beta_2^1 & \beta_2^2 & \dots & \beta_2^{n_K} \\ \dots & \dots & \dots & \dots \\ \beta_{n_K}^1 & \beta_{n_K}^2 & \dots & \beta_{n_K}^{n_K} \end{bmatrix}; \quad B_K^S = B_{1,n_K}^{\overline{n_K+1,n_K+n_S}} = \begin{bmatrix} \beta_1^{n_K+1} & \beta_1^{n_K+2} & \dots & \beta_1^{n_K+n_S} \\ \beta_2^{n_K+1} & \beta_2^{n_K+2} & \dots & \beta_2^{n_K+n_S} \\ \dots & \dots & \dots & \dots \\ \beta_{n_K}^{n_K+1} & \beta_{n_K}^{n_K+2} & \dots & \beta_{n_K}^{n_K+n_S} \end{bmatrix};$$

$$B_K^H = B_{1,n_K}^{\overline{n_K+n_S+1,n_K+n_S+n_H}} = \begin{bmatrix} \beta_1^{n_K+n_S+1} & \beta_1^{n_K+n_S+2} & \dots & \beta_1^{n_K+n_S+n_H} \\ \beta_2^{n_K+n_S+1} & \beta_2^{n_K+n_S+2} & \dots & \beta_2^{n_K+n_S+n_H} \\ \dots & \dots & \dots & \dots \\ \beta_{n_K}^{n_K+n_S+1} & \beta_{n_K}^{n_K+n_S+2} & \dots & \beta_{n_K}^{n_K+n_S+n_H} \end{bmatrix}.$$

Similarly are revealed blocks of other lines.

As the usual matrix notation (2) is suitable only for additive convolutions suspended variables, that transformation of equation (5) by using the functional matrixes.

$$\frac{dY}{dt} = C.*(BY + Y^B - D).*(A - Y), \text{ де} \quad B = \begin{vmatrix} B_K^K & B_K^S & B_K^H \\ B_S^K & B_S^S & B_S^H \\ B_H^K & B_H^S & B_H^H \end{vmatrix}; \quad (7)$$

by Y^B denote the elevation of vector in matrix degree, which in this work is analogous to a weighted multiplicative convolution $\prod_{j=1}^{n_K+n_S+n_H} Y_i^{\beta_i^j}$ the right side of ordinary differential equations that correspond to recording of matrix (7)

$$\frac{dY_i}{dt} = C_i \cdot (\sum_{j=1}^{n_K+n_S+n_H} \beta_i^j Y_i + \prod_{j=1}^{n_K+n_S+n_H} Y_i^{\beta_i^j} - d_i)(a_i - Y_i), \; i = \overline{1, n_K + n_S + n_H},$$

Pay attention that the weights of additive and multiplicative convolutions are not necessarily the same. Rather they should be different, ie the last equation is more appropriate to represent as

$$\frac{dY_i}{dt} = C_i \cdot (\sum_{j=1}^{n_K+n_S+n_H} \beta_i^j Y_i + \prod_{j=1}^{n_K+n_S+n_H} Y_i^{\gamma_i^j} - d_i)(a_i - Y_i),\ i = \overline{1, n_K + n_S + n_H}, \quad (8)$$

where γ_i^j - weighting coefficients of multiplicative convolution.

The expression $\sum_{j=1}^{n_K+n_S+n_H} \beta_i^j Y_i + \prod_{j=1}^{n_K+n_S+n_H} Y_i^{\gamma_i^j}$ from the last equation, or its matrix equivalent (same as (7)) in real situations can take a much more complex form, including a combination of additive and multiplicative convolutions, or their mutual immersion, or their functional transformation (eg logistic transformation to introduce asymptotic restrictions on the result of coagulation variables). So to cover all possible variants of clotting rewrite (8) as

$$\frac{dY_i}{dt} = C_i \cdot (\aleph_{j=1}^{n_K+n_S+n_H} f_i^j(\beta_i^j, Y_i) - d_i)(a_i - Y_i),\ i = \overline{1, n_K + n_S + n_H}, \quad (9)$$

where $\aleph_{j=1}^{n_K+n_S+n_H}$ - some convolution, $f_i^j(\beta_i^j, Y_i)$ - some functional dependence. The corresponding matrix equation can be rewritten in the form

$$\frac{dY}{dt} = C.*(\aleph(B, Y) - D).*(A - Y). \quad (10)$$

The conclusions. Thus, in the work presents improved model for teaching the example of training pilots. The model considers separately the dynamics of growth of knowledge, skills and abilities. Also, the model allows to separately consider an arbitrary number of components of the process of training aimed at acquiring specific knowledge, skills and abilities. The model most focused on computer implementation, in particular allows to take all advantage of the medium of matrix computation MatLab.

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Olegas Prentkovskis, Dr. of Technological Sciences;
Romualdas Kliukas, Dr. of Technological Sciences;
Vilius Bartulis, Dr. of Technological Sciences
(Vilnius Gediminas Technical University, Lithuania)

BACHELOR DEGREE STUDIES IN TRANSPORT AND ITS RELATED FIELDS: ATTRACTIVENESS OF ENGINEERING STUDY PROGRAMMES AMONG APPLICANTS IN VILNIUS GEDIMINAS TECHNICAL UNIVERSITY

A brief survey of admission to Lithuanian higher education schools is presented in the paper. Some statistical data on the popularity of study programmes (by studies areas) chosen by the applicants participating in the joint admission programme to Lithuanian higher education schools (e. g. study programmes of Vilnius Gediminas Technical University) is presented in the paper. Also the popularity of the Bachelor study programmes of transport and its related fields offered by Vilnius Gediminas Technical University is described.

Introduction

Freedom of movement has been one of the greatest values of humanity, which can be used if a developed transport system of the country is available. The transport sector was and still remains one of the most important economic driving forces of the country and Lithuania is not an exception as well [1, 2]. Analysts agree that transport will continue to have a positive impact on the economic growth. However, the growth of the transport sector, especially road transport, increases congestion and environmental pollution as well as reduces safety. Acts of terror occur in the air and railway transport, cars are also used for this purpose.

As a constituent part of the national infrastructure, transport has to satisfy human and economic needs in terms of freight transportation and passenger carriage. The transport sector is the underpinning element of supply chains in all industries. Transport services are used by all economic and non-productive activity sectors without any exception.

Development of the transport system is a positive factor for social and economic development of a country. Presently, economic development is hardly possible without an efficient transport system (providing both local and international services) [3]. Sustainable functionality of the transport system is not possible without the following three key components:

- traffic participants(or freight);
- vehicles;
- transport infrastructure (roads and terminals).

When Lithuania joined the European Union, transport and its related fields became the most important branches of national economy. It should be strongly emphasized that economic development of the country is closely related to the effective transport system both local and international. The operation of industrial, constructional and agricultural enterprises as well as work efficiency and public opinion largely depends on reliability and effective performance of transport system [1-3].

Modern society places a particular emphasis on technological and social sciences because no state can prosper without having a sufficient amount of highly qualified specialists in technologies, economics and management. The demand for specialists in technological and social sciences, their competitiveness in the labour market, prestige and payment as well as popularity of these specialities with school-leavers have been changing considerably during the twenty two years of Lithuanian independence.

The study programmes of social science are still the most popular with young people, however, technological sciences are ranked in the second place [4], and this is already a trend. Therefore, the present paper considers these significant issues.

Bachelor Study Programmes of Transport and its Related Fields Offered by Vilnius Gediminas Technical University

There are six study area groups in Lithuania: Technological Sciences, Social Sciences, Physical Sciences, Biomedicine Sciences, Humanities and Fine Arts.

Specialists in the area of transport and its related fields with Bachelor, Master and Doctor degrees are trained at universities of Lithuania – Vilnius Gediminas Technical University (BSc, MSc, PhD), Kaunas University of Technology (BSc, MSc), Klaipėda University (BSc, MSc, PhD), Aleksandras Stulginskis University (BSc, MSc, PhD) and the General Jonas Žemaitis Military Academy of Lithuania (BSc, MSc).

Bachelor study programmes of transport and its related fields which are offered by Vilnius Gediminas Technical University are presented in Table 1, all study programmes are covered by two study area groups – Technological Sciences and Social Sciences.

The all higher education schools of Lithuania formed an Association of Lithuanian Higher Education Schools to Implement the Programme of Joint Admission helping the applicants to enter the higher education school and to reduce the risk of a single possible choice, as well as making the selection of potential students more objective and simplifying the entrance by allowing them to apply for several higher education schools simultaneously. Based on this programme, an applicant is given an opportunity to choose a higher education school and a study programme according to his/her order of preference and depending on the marks obtained in a secondary school. An applicant submits an application to any of the higher education schools of the Association allowing him/her to select a number of study programmes in several higher education schools [4-5].

An applicant, participating in the joint admission programme, can mention up to twelve study programmes (choices) in the application to study at any Lithuanian higher education school. The applicant is admitted to a higher education school to study one of the study programmes included in his/her application, which is determined by a computer after calculating his/her competitive mark.

The structure of competitive marks of the applicants intending to study according to the stated programmes of transport and its related fields offered by Vilnius Gediminas Technical University are presented in Table 2.

Table 1

Bachelor study programmes of transport and its related fields offered by Vilnius Gediminas Technical University

Bachelor study programme	Specialization	Mode of studies	Term of studies [semesters]	Qualification
Study area – ***Technological Sciences***				
Transport Engineering	• Automobile Transport Engineering; • Automotive Engineering; • Railway Transport Engineering; • Transport Machinery and Equipment	• continual • extended	• 8 • 11	BSc of Transport Engineering
Aircraft Piloting *(Integrated Studies)*		• continual	• 10	MSc of Aeronautical Engineering
Air Traffic Control *(Integrated Studies)*		• continual	• 10	MSc of Aeronautical Engineering
Aviation Mechanics Engineering		• continual	• 8	BSc of Aeronautical Engineering
Electronics Engineering	• Avionics	• continual	• 8	BSc of Electronics Engineering
Automation	• Aviation Electrical	• continual	• 8	BSc of Electrical

	Equipment			Engineering
Roads and Railways Engineering		• continual • extended	• 8 • 11	BSc of Civil Engineering
Urban Engineering		• continual • extended	• 8 • 11	BSc of Civil Engineering
Bridges and Special Structures	• Bridges; • Special Structures	• continual	• 8	BSc of Civil Engineering
Study area – ***Social Sciences***				
Transport Engineering Economics and Management	• Transport Economics; • Transport Logistics	• continual • extended	• 8 • 11	BSc of Transport and Logistics

Table 2

The structure of competitive marks (without any additional points) of applicants intending to study according to the programmes of transport and its related fields offered by Vilnius Gediminas Technical University

Examination mark at secondary school	Weighted coefficient	A yearly mark in school-leaving certificate of secondary school	Weighted coefficient	The maximal competitive mark (without any additional points) available at study programme
Study area – ***Technological Sciences*** Study programmes – **Transport Engineering, Aircraft Piloting, Air Traffic Control, Aviation Mechanics Engineering, Electronics Engineering, Automation, Roads and Railways Engineering, Urban Engineering, Bridges and Special Structures**				
Mathematics	0,40	a Foreign language	0,20	20,60
the Lithuanian language	0,20			
Physics	0,20			
Study area – ***Social Sciences*** Study programme – **Transport Engineering Economics and Management**				
Mathematics	0,40	History or a Foreign language	0,20	20,60
the Lithuanian language	0,20			
a Foreign language or History	0,20			

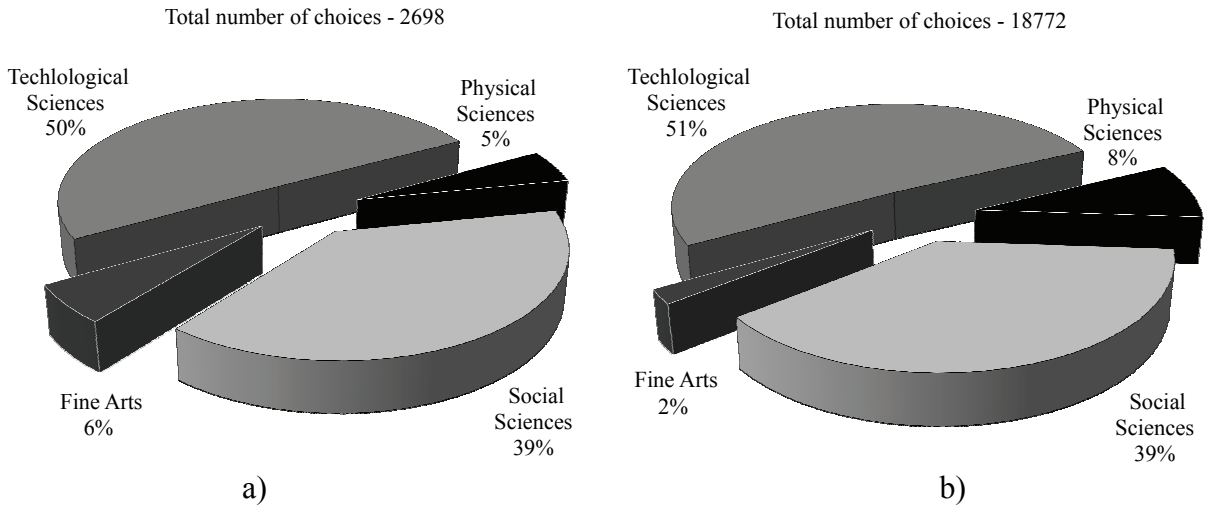
Popularity of Study Programmes in Transport and its Related Fields with the Applicants, Participating in Admission to Vilnius Gediminas Technical University

The present publication was being prepared for the Fifth World Congress 'Aviation in the XXI Century' before the joint admission campaign for 2012 was over. Therefore, the data for 2011 year are provided.

The popularity of study area groups reflected in school-leavers' applications to the state-fixed quotas in Vilnius Gediminas Technical University in 2011 are presented in Fig. 1. Nowadays, Technological Sciences and Social Sciences are the most popular study area groups.

The popularity of study programmes (percentage of the total number of choices) in transport and its related fields in school-leavers' applications in 2011 are presented in Fig. 2. Nowadays, **Transport Engineering Economics and Management** and **Transport Engineering** are the most popular study programmes.

Maximal and minimal competitive marks of applicants which admitted for continual studies in transport and its related fields study programmes in 2011 are presented in Fig. 3. As shown, more qualified applicants were admitted to study **Transport Engineering Economics and Management** programme. The maximal competitive mark (without any additional points) available at particular study programme – 20,60 (see Table 2).



a) b)

Fig. 1. The popularity of study area groups reflected in school-leavers' applications: a – based on choice No 1; b – based on all choices

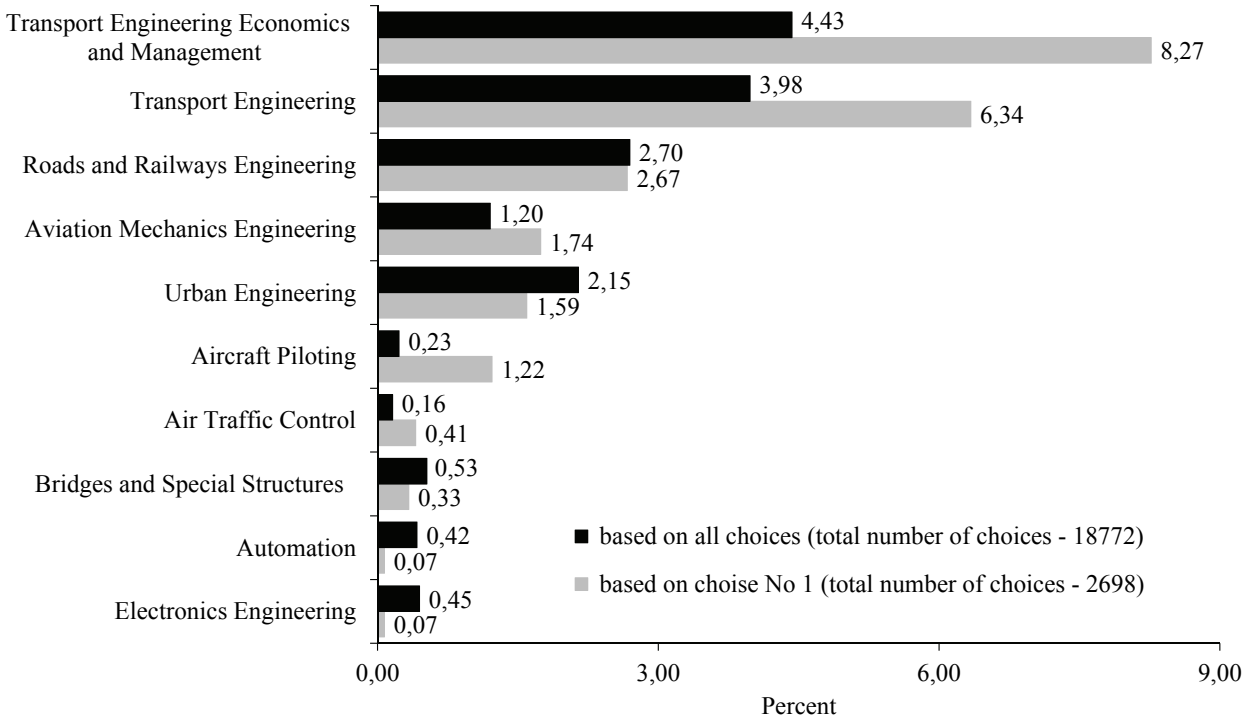


Fig. 2. Popularity of study programmes (percentage of the total number of choices) in transport and its related fields in school-leavers' applications in 2011

Conclusions

In Lithuania, there are six study area groups: Technological Sciences, Social Sciences, Physical Sciences, Biomedicine Sciences, Humanities and Fine Arts. Study programmes of transport and its related fields, offered by Vilnius Gediminas Technical University are covered by two study areas, e. g. Technological Sciences (nine study programmes) and Social Sciences (one study programme).

The **Transport Engineering Economics and Management** study programme (percentage of the total number of choices – 4,43% and 8,27%) referring to Social Sciences and the **Transport Engineering** study programme (percentage of the total number of choices – 3,98% and 6,34%) referring to Technological Sciences are more popular among the applicants to higher education schools than other related fields study programmes.

The educational level of the applicants and those admitted to take various study programmes

can be defined by their competitive marks. More qualified applicants were admitted to study the **Transport Engineering Economics and Management** study programme (maximal competitive mark – 20,60, minimal – 16,30) referring to Social Sciences and the **Aircraft Piloting** study programme (maximal competitive mark – 20,06, minimal – 16,56) referring to Technological Sciences.

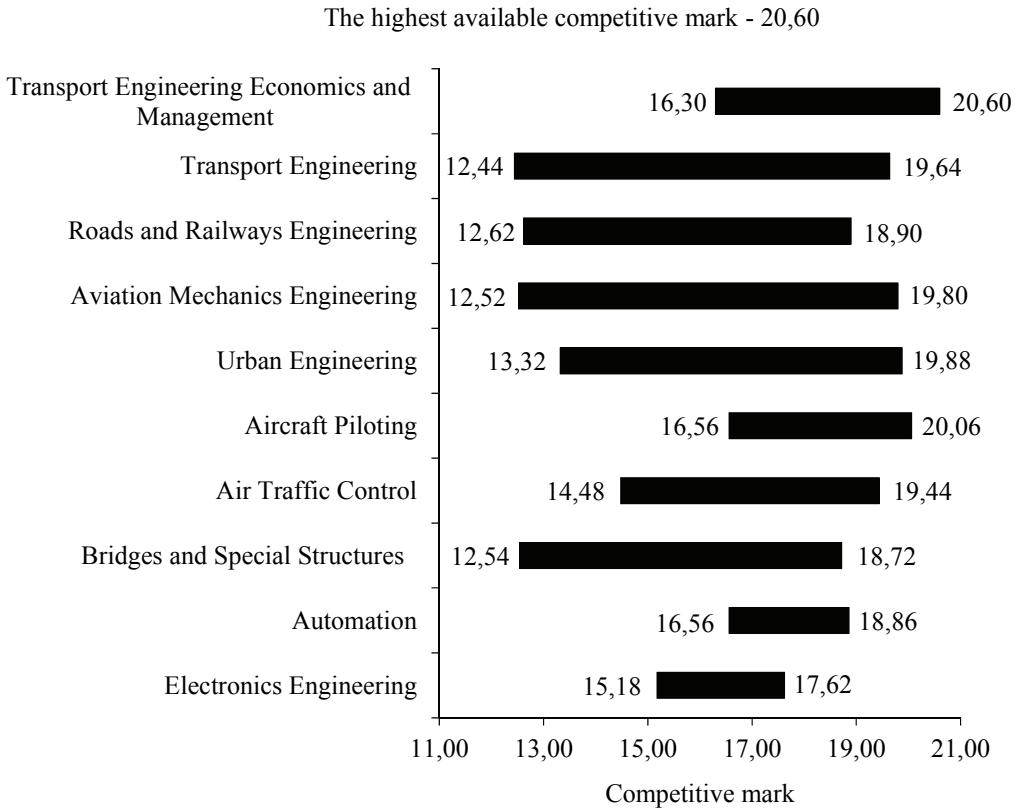


Fig. 3. Maximal and minimal competitive marks of applicants which admitted for continual studies in transport and its related fields study programmes in 2011

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M.V. Grynyova, D.Ed., (V.H. Korolenko Poltava National Pedagogical University, Ukraine)
V. Shpylyovyi, Ph.D. (Technical Sciences) (National Aviation University, Ukraine),

PECULIARITIES OF PROFESSIONAL ENVIRONMENT FUNCTIONING AT THE MANAGEMENT AND ART OF TEACHING SUB-DEPARTMENT

The article deals with professional environment, its establishing and functioning at the management and art of teaching sub-department of V.H. Korolenko Poltava National Pedagogical University with the aim to raise efficiency of master course activity in major "Project Management".

By the Law of Ukraine "On Higher Education" the main goal of higher educational establishment activity is "provision of conditions, essential for a person to obtain higher education and staff training to meet the necessities of Ukraine" [Article 22, paragraph 1]. Primary tasks of higher educational establishment are: accomplishing educational activity, which provides staff training of proper educational and qualification (educational and scientific) levels and meets the demands of the higher education standards; performing scientific, scientific and technical, production, innovative, cultural and educative activity; assurance of cultural and spiritual development of personality, education of students studying at higher educational establishments along with humanism and respect to the Constitution of Ukraine and state symbols of Ukraine; raising cultural and educative level of citizens, etc. Thus the Law defines priority directions of higher educational establishment activity.

The necessity of major 8.18010013 "Specific Categories. Project Management" functioning is called forth by the following specific requirements of the present time:

1. Rates of industrial changes are stepping up, that is why traditional organizational forms, effective in stable environment with invariable functions, do not prove to be correct. The preference is shown for flexible strategies, organizational structures and cultures, which provide rapid reaction to changes.
2. Market conditions are getting more exacting, projects – more massive and require higher level of management professionalism. Problems of human relations, which comprise leadership, motivation, team creation, conflict management are gaining importance.
3. Managers' activity is connected with carrying out the projects, which requires special skills, toolkit, organizational culture.
4. Project management introduces forms and methods, which allow directing integration processes into education and production effectively.

Due to new quality requirements to specialist training, which correspond to the needs of accelerated scientific and technical, social and economic development of the country, creation of professional environment at the sub-department of higher educational establishment becomes a significant factor for improvement of the whole specialist training system for different production branches.

Professional environment of a sub-department is founded on the functional and competence-based approach, which reconstructs modern conception of pedagogical activity as a difficult, diverse and multiple-aspect educational system, represented as specific relations, interactions, skills, knowledge and experience. A constituent part of the professional environment is creative and educative one. Creative and educative environment is the environment of personality, where state of person becomes harmonized, consequences of stress are neutralized, creative abilities get developed, health improving impact is performed for the whole organism, interrelations with social environment are directed into constructive track, contacts with own essence and the inner man are getting easier, possibilities of being involved into the creative improvisation process, with maximum possible self implementation, self development and self creativity, identifications of purposeful creative activity, comprehension and determination of possibilities and life goals are increasing.

Since sub-departments are principal structural subdivision of the university, while characterizing development peculiarities of research and educational employees, it is important to define their place and role in the organizational structure of higher educational establishment. A sub-department, by the Law of Ukraine "On Higher Education" is defined as "a basic structural subdivision of higher educational establishment, which carries out educative and methodological activity in one or several related majors, specializations or academic subjects and performs scientific, research, scientific and technical activity in specific direction". Thus main professional activity of research and educational employee consists of educative, methodological, scientific, scientific and research, scientific and technical activities in directions, determined by the sub-department. Research and educational employees are subjects of educative process at higher educational establishments. According to the Law of Ukraine "On Higher Education" posts of educational research employees can be held by people, who have academic degrees or titles or who have graduated from higher educational establishment with master's educational and qualification level in definite specialty. It is reasonable to point out that the Law proclaims research and educational employees to be the people having principal place of employment at universities, academies, colleges perform educational, methodological, scientific (scientific and technical, artistic) and organizational activity. Thus professional development of educational research employee must be based on these main activity directions, which are defined by the Law. It is necessary to mention [Article 48 of the Law of Ukraine "On Higher Education"], that a teacher is a primary post of research and educational employees of higher educational establishments.

Research and educational employee is a scientist, who at principal place of employment performs professional pedagogical and scientific or scientific and technical activity at higher educational establishments and establishments of postgraduate education of III-IV accreditation levels. As it can be seen the activity of educational research employee is directed not only to educational activity, but also to the scientific one, which makes the basis and is the basis of his educational work at higher educational establishment. It must be pointed out that Encyclopedia of education considers the activity of educational research employee as mental activity, which can be characterized by the following features: "high specific weight of neuropsychic load; considerable loss of mental energy; degree of intellectuality, which requires high level of professional knowledge and qualification; significant result dependence on personal qualities and skills of a practitioner; big part of creative work, compared to physical activity and higher degree of responsibility. So, while characterizing professional development of research and educational employee, it is important to mind specific character of his activity. In our opinion efficiency of work and professionalism of research and educational employee also significantly depend on his personality.

Methodology of stable development is considered to be a concept basis of pedagogical system development of sub-department, which has to agree with state educational development strategy and must be considered in the light of creation of efficient professional environment. Strategic vision of final results is really important. The final goal of professional development is shaping employee's professional culture, which is expressed in high level of professional education, competence and skills, understanding of importance of his profession and him to be a professional, devotion to his job, getting social and personality important creative results on this basis, significant contribution into culture of society and humanity.

It is important to consider quality estimation system of work of research and educational staff at the sub-department:

1. General characteristics (scientific and educational experience, academic titles and scientific degrees, titles and awards, managerial positions);
2. Pedagogic activity (educational load, assisting in licensing and accreditation, level of educational load, students' estimation of teaching);
3. Scientific work (preparation of research and educational staff, inventive activity and research work, scientific publications, monographs issuing, presenting results of scientific work, receiving scientific awards, scholarships);
4. Methodological work (issuing manuals, training aids, instructor's manuals, working out

and implementation of knowledge control means of students, including those of electronic, working out, modernization and implementation into educational process of laboratory equipment of all types and kinds);

5. Organizational work includes wide range of duties, which on the one hand have to do with main directions of educational research activity, and on the other – characterize qualities of research and educational employee as a personality (preparation and holding conferences, competitions, contests, training students for taking part in different scientific and methodological events, taking part in the work of commissions, councils, etc.);

6. International activity (receiving grants from state and non-state grantors, active work with foreign educational establishments).

Primary goal of professional environment functioning at the sub-department is making possibilities to cause a student's or a magistrand's active stand in life.

Stable development lies in defining and removing destructive reasons and finding support for constructive changes. Stable development conception is aimed to preserve social and cultural stability, reduce destructive conflicts. To reach stable development it is necessary to make efficient system of making decisions, which will take into account educational research employees, students and magistrands' interests and will be aimed at reaching the set goals. Working out and making decisions mechanisms must be directed towards defined priorities at the department and consequences of these decisions realization must favor successful professional training of students and magistrands.

Magistrand having mastered educational and intellectual values passes them on to the society outside the educational establishment in the following ways:

- students and magistrands' familiarization with elements of research work, imparting professional skills to them;
- scientific research proper guided by professional and teaching staff of the sub-department;
- communication, culture and educational inquiry;
- participation in public work, cultural and sports activities;

Professional environment is an educational system, which comprises the following components:

- educational research employees staff and social infrastructure;
- educational and methodological, scientific and methodological support;
- international educational, scientific relations;
- conditions to perform scientific activity and involve students into it according to training of major 8.18010013 "Project management".

A characteristic feature for a sub-department is a collective activity of formal and informal research structures, mainly of scientific schools, which are effective forms of creative and collective scientist collaboration. Therefore analysis of activity characteristic for scientists, organizers of science and research teams, mechanisms of collective work, its forms of organization and process of scientific schools formation, traditionally attract Ukrainian and foreign scholar's attention.

Nowadays problems of future scientific elite preparation are of the state significance. At the management and art of teaching sub-department there is an obvious necessity for successful professional environment, which ensures constant youth attraction to science. High skilled specialist training at scientific schools is effective educational technology, which corresponds to the modern requirements of national education and science development. Nowadays importance of the scientific school as an effective model of education, which propagates, besides truly scientific sense, cultural norms and values from older generation to younger one, significantly rises. That is why, questions connected with scientific schools formation and successful functioning, their contribution to national and world science are acquiring special meaning. These are scientific schools of professors at the sub-department (M.V. Grynyova, N.M. Tarasevych) which are specific educational environment, where brain power "grows". For the purpose of formation of magistrand body, the sub-department uses different methods to get students interested in the major. Management and art of teaching sub-department has been successfully working out development and discussion of

relevant questions of educational management, involving into collaboration leading scholars of Ukraine, organizing scientific and practical conferences and seminars of managerial orientation, each of which involves magistrands, future education managers. For the period of 2011-2012 the management and art of teaching sub-department conducted: International scientific and practical conference "Management technologies of educational establishment", dedicated to the memory of A.S. Makarenko on 11th -12th March 2011; all-Ukrainian scientific and practical seminar "Project Management: Problems and Development Prospects" on 11th -12th March 2011; all-Ukrainian seminar "Innovative approaches to creation of methodological support of major "Project Management"" on 17th -18th November 2011. International scientific and practical conference "Management of teaching and educational process organization at secondary and high school" dedicated to the memory of A.S. Makarenko on 13th -14th March 2012 and all-Ukrainian scientific and practical seminar "Methods of Educational Establishments Management" and "Project Management in the sphere of science, education, innovation and informatization" on 13th March 2012. According to the results of each scientific event and discussion report materials, published in research work collections, are being prepared. Scientific articles with scientifically important groundwork of art of teaching and educational management are published in annual professional collection of management and art of teaching sub-department "Sources of Art of Teaching", included into list № 20 of scientific professional issues of Ukraine (resolution of 22d December 2010, № 1-05/8).

Management and art of teaching sub-department is an acknowledged in Ukraine and world center of Makarenko studies. Secretariat of Ukrainian Association of Anton Makarenko and International Makarenko Association (responsible secretary-associate professor A.V. Tkachenko) work in the sub-department. A.V. Tkachenko is responsible for scientific management of exposition project of A.S. Makarenko State culture preserve near Poltava. They provide collaboration of national centers of Makarenko studies abroad (Germany, Czech Republic, Poland, Italy, Hungary, Russia, China) with Ukrainian scholars, they initiate organization of resonance international and all-Ukrainian conferences (1998,2002, 2003, 2005-2012). In November 2008 Ukrainian-Italian research laboratory in A.S. Makarenko's heritage (the heads: from Ukraine – associate professor A.V. Tkachenko, from Italy- Emiliano Mettini) was established.

Teaching academic staff training of high professional skills is done mainly via master course, postgraduate course and institution of doctoral candidacy of V.G. Korolenko Poltava National Pedagogical University, and also via doing target postgraduate course at leading educational and scientific establishments of Ukraine. Teachers of the management and art of teaching sub-department, who graduated from the master`s course with honors (Belyayeva N.V.,Bolovatska Yu.I., Kryvoshapka I.V. Krachshenko Yu.P.) have entered postgraduate course (scientific adviser: Grynyova M.V.). During 2004-2012 24 Ph.D theses were defended, 8 DPhil. are being prepared at the department. 7 student problem groups (directors: M.V.Grynyova, N.M. Kryvonos, L.V. Malakanova, N.M. Pyvovar, A.V, Tkachenko, O.G. Shtepa, G.Yu. Sorokina, Yu.P. Krachshenko) function at the sub-department.

The best students are involved into master`s course applicants selection. The following factors are considered: progress of students, their research activity, science and educational skills, public activity. Such selection is made via doing research works and diploma theses, participation in all-Ukrainian student competitions, contests of students` scientific studies. Student's participation in scientific working outs of the sub-department, common publications with adviser and individual works, participation in the conferences and seminars are taken into account. In terms of such work organization these students have 3-4 publications each. Students, future magisters, take part in writing methodological recommendations, training aids, which are used in their educational work by teachers, magisters, students and pupils. For example, Barbinova Alla Volodymyrivna received first prize of Poltava Regional Counsel for the victory in the contest of student research works "From student self-government – to self-government of communities" (Poltava Regional Administration) and third level diploma for the victory in the second round of all-Ukrainian contest of student research works with orientation of "Management" (Kharkiv National Economic

University) with work “Project Making Management “Youth family” (scientific advisor: professor M.V.Grynyova).

In March 2012 management and art of teaching sub-department (head of a chair doctor of education, professor Grynyova Maryna Victorivna) of V.G. Korolenko Poltava National Pedagogical University, was awarded with Diploma of Laureate of International Academy of Rating Technologies and Social Science “Golden Fortune”, nomination “For significant contribution to the development of Ukraine and strong qualifications in the sphere of education and science”.

Conclusions. Thus professional environment of the sub-department is a pedagogical system, consistent educational environment in a stable development, is characterized by the efficiency of work and professional competence of educational research employees and magisters and students’ active, creative activity.

Achievements of high managerial skills of master`s course graduates 8.18010013 “Specific Categories. Project Management” can be seen in its development and improvement, which provide the following directions:

- to work out the academic subjects content to meet the requirements of modern education and science;
- to work out the activity of methodological complexes working under the art of teaching sub-department;
- to improve magisters` teaching practice quality and effectiveness (probation) via studying and spreading state-of-the-art educational experience of the best educational establishments directors, teachers-innovators of Ukraine, higher educational establishments rectors;
- to form the art of teaching basis of education managers, which main constituent parts are: art of teaching as a complex of characteristics of teacher’s personality, professional knowledge, abilities, skills; educational technique; educational skills; professionally significant personal qualities; pedagogical communication, its optimization; conflict prevention and solution; pedagogical tact; group activity organization; pedagogical interaction projecting; active, informative and developmental activity stimulation in the process of a game, a lesson; informative activity; self-education and self-discipline as a cause of professional skills improvement;
- to create advisory offices to enrich managers’ educational and psychological culture. Consultation tasks are: personal and professional qualities psychodiagnosis, emotional and psychological state of managers; managers` personal restrictions correction; psychotherapeutic activity; diagnostics of social and psychological state of organization and informing managers about it; organization and holding trainings, seminars, conferences and other educational events;
- to develop collaboration strategy of master`s course on the basis of mutual aid, holding common arrangements;
- to improve scientific schools activity and popularize scientific achievements of the management and art of teaching sub-department;
- to search for new management models, which include principles of convergent educational management, implemented in educational establishment: priority of a child and a family as a consumer of educational services; priority of social educational values as state educational standards; high quality of education and efficiency of teaching and educational process; universal values support; morality of relations; helping other people to reach success; orientation on the development prospects;
- to improve methodological support of school plan, curricula, subjects, which are taught at master`s course and manuals, introduced into the process of education;
- to hold pre-professional training of future managers via pedagogical stimulation of implementing of organizational qualities of students, teachers, educational managers.

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H.Yu.Sorokina, PhD (V.H. Korolenko Poltava National Pedagogical University, Ukraine).
O.A. Mykhalchenko, PhD (National Aviation University, Ukraine).

COMPETENCE IN SPECIALIST PROFESSIONAL TRAINING

Question of the role of competence-based approach in the system of continuing professional education has been clarified. Generalized idea of essence of the notion of specialist's "competence" has been presented having taken into consideration generalization of scientific standpoints according to understanding of the given term. Main structural components of competence have been singled out and their essence has been shown having based on structure of activity.

The notion of educated person has acquired a new meaning in the contemporary world. Educated person is not the one who knows a lot but the one who is able to use methods of correlation of everything he knows and can with his plans and situation, who successfully adapts to technological and social changes. Making up of personality being able to act adequately in appropriate situations, applying knowledge and taking upon oneself responsibility for the activity, is taken as a basis of the concept of competence-based education. So in the process of specialist professional training the orientation on personality competence is determinant nowadays, which allows making adaptation to professional environment easier, increasing competitiveness of a school-leaver able to function effectively in new dynamic socio-economic conditions.

Being guided by the definition of the notion "professional" suggested by L.V. Malakanova and A.K. Markova [1, 2], we are going to define professional training as mastering professional culture, professional technologies and professional skills, which gives an opportunity to carry out one's professional competencies. Since main factor is mastering work methods on the basis of gained knowledge rather than acquirement of this knowledge, main traits of personality as a specialist should be:

– understanding of professional activity as an integrative process, in which analysis and synthesis are corroborated by adaptation to society needs and understanding of environmental problems;

– ability of contextual comprehension of functions and situation: consideration of economical, production, international and other conditions, in which activity is carried out;

– completion of professional knowledge during all labor activity and adaptation to changes of technical and technological environment in world market;

– analytical thinking with ability of critical appraisal of objects and problems by means of modeling, imitation, optimization on the basis of thorough knowledge in the sphere of fundamental natural and humanitarian sciences;

– ability to synthesize innovations at the stage of their planning and production with rational assessment of consistency and their full realization.

Study of the meaning and structure of the notions "competence" and "competency" outlined a broad spectrum of their interpretation, which differ in size, content, semantic and logic structure. Principal notions of the competence orientated education are described in many works of Russian scientists such as V.I. Baydenko, A.S. Byelkina, A.V. Dakhina, S.O. Druzhylova, O.Ye. Lyebyedyeva, I.O. Zymnya, A.V. Khutorsky, M.A. Choshanova, S.Ye. Shyshova and others, who suggest that a competent specialist is different from skilled one because the former not only possesses certain level of knowledge, abilities and skills but is also able to implement them and implements them directly at work. In publications of domestic experience achievements they also pay attention to competence-based approach as one of ways of education development in Ukraine, in particular works by I.H.Yermakov, O.V. Ovcharuk, I.V. Rodyhina, L.V. Sokhan and others.

While summarizing results of theoretical studies and basing on A.S. Byelkin, M.M. Zhukova, E.I. Kleyman, A.V. Khutorsky's scientific studios, it has been decided to be effective to consider competency as a set in advance social demand (norm, function) to education of a specialist

necessary to his high-quality productive activity in the appropriate field. Competence sets range of purposes, roles, set of tasks or demands which are to be done by a person; this is authority delegated to a specialist (external characteristic, a thing which must be in specialist's control).

Majority of authors abandon themselves to the idea that competence is a principal notion, meaning of which is formed by those who use it, as a way of establishment of interaction between educational establishments and demands to future specialists of a specific field. Emphasizing that competence becomes apparent only in a certain kind of activity, M.V. Ryzhakov points out that it cannot be isolated from particular conditions of its implementation [3]. Competence indicates individual's ability to use corresponding competencies with personal attitude to them and to the object of activity.

We define specialist competence as an integrated personality quality that reflects degree of mastering certain competency and allows acting constructively (reasonably) in changeable social conditions. So competencies are referred to activities and competence to characteristics of the subject of activity.

Concept of activity and its organization was interpreted in universally recognized works by L.S. Vyhotsky, O.M. Leontyev, A.V. Petrovsky, S.L. Rubinshteyn and others. A human exists, functions and develops as personality while working. Since mastering an activity is possible while changing oneself into subject of activity and mastering every significant component of activity, it is necessary to define its structure. Unique approach to understanding of professional activity structure does not exist so far. Having analyzed existing opinions it has been ascertained that a structure of professional activity can be described by means of characteristics of different kinds of activity, which are its content components. We can consider activity as a process that includes a range of stages in their logical succession and requires singling out procedural characteristics (functions) such as diagnostics, goal-setting, planning, organization, control and correction of activity results etc. In this study it has been decided to be necessary to single out content component of activity by analysis of activity content, and procedural component by description of logic, considering both approaches when activity structure is defined. All structural components are directly bounded with each other in a system, preserving by that their autonomy.

List of activity structural elements suggested by V.A. Semychenko gave an opportunity to solve a number of practical tasks of professional training when these elements and products are filled with appropriate meaning, which is a result of their integration [4, p.295].

Main structural competence components have been singled out, namely: motivational and purpose-oriented, subjective, objective, technological and effective. Each of these components must be formed at three levels: motivational, cognitive and operational. It should be noted that formation of effective component is possible only provided by complete formation at the three levels of all the above mentioned components.

Motivational and purpose-oriented component means initiating positive motivation of competence display. Meaning of motivational and purpose-oriented component is defined with the help of analysis of source of human activity, stimulating powers of human behaviour, values, understanding objects of his activity for mastering effective methods of its organization. A person actively takes part in activity when he clearly envisages objective of this activity, decides why the activity is needed and what will be received as a result. Objective of activity is a perfect image embodied in product which is the result of transformation of an activity object. It is important for the objective of activity to be significant for a personality. Correspondingly, imposed externally (extraverted) objective of activity should become inherently attractive and realized by a personality, comprehensible and necessary for a student who consciously apprehends tasks of the activity and shows inner readiness to their fulfillment, can transform externally given objective of activity in own objective and task of the activity being carried out.

Subjective component implies student's awareness of himself as subject of activity, diagnostics of his own abilities while carrying it out, perception of his own personality qualities that ensure activity implementation, active part in the activity, creation of individual perception path that makes him unique and original. Student having need, desire, experience takes an active part in

activity. Diffident student has complexes, avoids, patterns. Subjective component implies basing on main human needs: in perception, in communication, creativity, education, at work, in recognition and security, in pleasure, in understanding of one's own activity, in broadening of world outlook. And the more needs are satisfied by a student while taking part in the activity, the more self-actualization and delight will be taken.

Object component implies positive attitude to the object of activity, interest in it and need to work with it, knowledge of the object of activity, its peculiarities, opportunities, ability to work with it and use it in one's own life activity.

Technological component requires means and methods of activity appropriate usage. Every student chooses those means of activity which are the most convenient, available and attractive for him. He studies their specific character, limits of usage and, considering own abilities and necessities, applies them, producing own methods of doing the job – own technology, that is why every person carries out suggested activity in his own way.

Effective component introduces individual's level of mastering competencies, allows conscientiously appraise results of own activity and development level. So the result of competence formation is stable need to do professional activity, interest to it and desire to self-improvement in it, deep sensible knowledge of this activity specific character and its skillful fulfillment.

So, according to competence-based approach, main features of professional training of specialists are: understanding of own activity content, awareness of oneself as a subject of activity, independent transference of knowledge and skills in new situation, ability to recognize problems in a familiar situation, vision of a new function of production object, determination of object structure, determination of different ways of solving problem situations, independent combining of known methods of activity, development of completely new method of solving problem situation, appraisal of own successful activity.

Conclusion

Competence-based education, directed to intensification of personality aspect of human development, corresponds to contemporary requirements of specialist training. Competence-based approach topicality is determined, on the one hand, by desire to achieve high quality of education according to contemporary demands to production, on the other hand – by understanding hopelessness of extensive way of solving problems due to knowledge volume increase. But condition of theoretical and methodological supply of this process now requires scientists' additional efforts, which proof is search of unified conceptual and terminological apparatus in theory and practice of competence-based education. Since competence is determined by professional activity content and personality characteristics, it is systematic and organized, integral, personality-oriented characteristic of a future communication specialist as a subject of activity, equal to objectives and content of a certain kind of one's professional activity.

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N.V. Zakharchuk, Ph.D. (NAU, Ukraine)

THE PROBLEM OF PREPARING FUTURE ENVIRONMENTALISTS TO THEIR PROFESSIONAL ACTIVITY IN THE CONTEXT OF FUNDAMENTALIZATION OF EDUCATION

The article considers the relevance of professional training of future ecologists, its content and value in the context of fundamentalization of education. The analysis of scientific literature that deals with outlined problem and the ways of its solution while preparing future environmentalists for professional activity is given.

Now it is hard to find at least one sphere which has not undergone the influence of cultures of other ethnic communities and nations. Therefore, the task of professional training of students in ecological areas is the formation of students' humanistic values, teaching them international professional collaboration, creating opportunities for constructive cross-cultural communication of future technical specialists with foreign colleagues.

Such changes in the training of future ecologists require the fundamentalization of the content of environmental education as the later provides the conditions for preparing socially protected, competitive specialists with high levels of cognitive interests, spiritual needs, and creative activity, independence, responsibility and so on. The leading idea in the future professionals' training is the need for acquiring the most important basic knowledge and skills; it will give an opportunity to rely on them in performing professional activity. The fundamentalization of education aims to provide modern specialists with occupational mobility, which is becoming more and more relevant in the increasingly competitive labor market.

The analysis of scientific approaches shows that many leading specialists are involved in the studying and development of the problems of environmental education, such as N.M. Burinska, I.D. Zverev, S.V. Krimsky, N.V. Lysenko, L.B. Lukyanov, N.H. Nychkalo, O.V. Plakhotnik, G.S. Tarasenko and others. The issues of environmental education of students are shown in the works of V.V. Avdeeva, L.I. Bilyk, V.S. Krysachenko, M.L. Kurka and others. The formation of ecological consciousness is studied by M.M. Kiselev, B.T. Likhachev, O.V. Plakhotnik and others. The problems of environmental training are analyzed by B.G. Yohanzen, I.D. Zverev, G.S. Tarasenko and by many other scientists.

The researches are conducted even in the area of formation of foreign language competence and communication peculiarities of ecologists (E.V. Bibikova, I.A. Rozmarytsya and others). However, the scientific literature does not pay attention to the problem of preparing future ecologists to the professional activity in the context of fundamentalization of education.

In the light of recent changes in the system of higher education the mastering of the fundamental values of science, culture, art, profession becomes personally meaningful for the students in the training process. Therefore, the problems of fundamentalization of training process as a basis to improve its quality are revealed to some extent by many scientists: S.Y. Batyshev, G.A. Vaskivska, S.U. Goncharenko, M.M. Kovtonyuk, I.P. Kuzmina, V.S. Lednev, E.V. Luzik, N.H. Nychkalo, L.Z. Tarkhan and others.

The topicality of the problem is caused by the need to resolve contradictions: between the general needs of modern society in qualified environmentalists who are ready to successfully interact with colleagues at the international level, and the real situation with preparing future ecologists to communicative activities in the higher technical educational institutions; between the increased level of students' professional competence and not fully developed training techniques in the context of fundamentalization of education.

The issues of professional training of ecologists are closely related to global and national problems of protecting and preserving the environment, human interaction with nature, natural resource management and others. The desire and efforts of one country is not enough to solve these

issues, so it is necessary to act at the international level.

Over the past decades together with economic and political problems environmental issues gained the leading positions. Now the term "ecology" is identified with the verbs "to act" and "to save", because the environment is one of the main values, preservation and restoration of which concern all countries. This outlines the necessity of formation of public environmental awareness, improvement of environmental education and training of ecological specialists.

Now the international community is actively developing strategies to preserve our planet, it is evident from the goals and objectives of international conferences. Thus, at the International Conference in Tbilisi (1977) goals and objectives of environmental education are identified. Further development of mankind's ecological awareness took place at the international conferences in Paris (1998), Zurich (1999), Brussels (1999), Dakar (2000), Johannesburg (2002) and other cities [1].

Recently, many countries have developed programs, concepts, strategies of environmental education, textbooks, and manuals, scientific and popular literature on the problems of nature protection; there are a lot of films, held numerous conferences, seminars and meetings. Well-known world organizations of environmental protection, "Greenpeace", "Lehambiente" and others are engaged in environmental policy at the international level.

Today in Ukraine the system of environmental education is defined and regulated by the relevant legal framework, the main document of which can certainly be determined as the Concept of Environmental Education, by the decision of the Ministry of Education and Science of Ukraine from 20.12.2001. This concept was developed on the basis of previous documents about the reforms of the educational process in Ukraine, e.g. Law of Ukraine "About Education" (1996), the Law of Ukraine about Environmental Protection (1991), Decree of President of Ukraine from 12.09.1995 "About Main Ways to Reform Higher Education in Ukraine", the State national program "Education" ("Ukraine in the XXI century", 1994), The National Doctrine of Education Development in the XXI Century and others.

Under these conditions, the role of ecological specialists becomes more important, more requirements to them as to the professionals are made. In addition to excellent knowledge of their professional field, the knowledge, abilities and skills that would be the training core of future environmentalists and give them the opportunity to develop, to improve their skills are required.

If in the high school the principle of fundamentalization can be put into action by providing appropriate conditions for the formation of the need for self-development and self-education throughout life, for the acquiring of professionally-oriented knowledge and skills. It is worth mentioning that the function of fundamentalization of curriculum in higher education should be performed by "fundamental" subjects. Though, now they seem to be coordinated, but still do not have that fundamental character. This leads to a rather narrow specialization of future ecologists. Thus, the problem of theoretical and practical training of future professionals is fundamental.

In the educational process of higher technical educational institutions the teachers of specialized subjects, of the Humanities, in particular Ukrainian business language, Culture, Foreign language and other disciplines, work together to solve this problem and to create effective means of fundamentalization of higher professional education. Particular importance is given to the integrated courses.

We agree with L.Z. Tarkhan, that fundamentalization of training in modern higher education should be considered as a didactic principle, holistic multidimensional process of improvement of didactic system, all components of which are transformed to the specific principle of fundamentality; as the system of the fundamental conditions to design the educational space [2].

Here professionally oriented training becomes important; it is thoroughly studied by L.O. Savenkova. She emphasizes that "orientation in their profession" should take place at the level of knowledge and the level of positive emotional experience. Thus it is appropriate to accomplish the following tasks: to specify future specialists' attention not only on the result but also on the process; to make students' actions successful; to make future specialists use creative elements in their work both professional and communicative [3, p. 46]. This should include professionally-oriented subjects, such as: "Human Ecology", "Modeling and Forecasting the Environment",

"Landscape Ecology" and so on.

Students' orientation to the future profession should have also a personal character. Specific requirements for professional skills of future environmentalists as a pledge of successful professional activity are made. Here, according to S.P. Bondar, of great importance is the question "why are they doing it" [4, p. 52]. Once future ecologists realize the importance of their professional activities, the positive changes in their attitude to implement their knowledge will take place.

One of the priorities facing education is the formation of the skills and individual competencies of young people that will allow them to "learn life and social roles in order to live with dignity in a new century". Among these qualities there is environmental education, and among the core competencies there is a professional orientation [5, p. 27].

Therefore at the present stage of scientific and technological progress not just training but professional training becomes more and more popular to compensate human harmful effects on the environment.

Since the solution of environmental issues are at certain levels: local, national and international, except a basic environmental education future ecologists must have well-formed intercultural communication skills for successful collaboration with colleagues at international level. This will be successful due to social and positive motivation of the training process, of intercultural communication within the professional activity.

Thus, the outlining of professional relevance of educational information and its connection with real life not only stimulates the development of educational and professional motivation of students, but also their interest in business communication, within which there is a professional interaction. The main motivation here is caused by the desire for professional self-improvement. Professional motivation is determined and completely depends on the informational potential of the studying material that meets the students' needs. Accordingly, informationally poor material does not form a positive training and professional motivation.

Today we should thoroughly think over what "fundamental" disciplines are required for a particular specialty. Implementation in the training content of future environmentalists the material that will be necessary for their work graduates their future career. This is a problem that requires immediate decision in the light of integration into the European educational space.

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V.A.Kuznetsov, Professor Associate (National Aviation University, Ukraine)

INFORMATION AND COMMUNICATION TECHNOLOGIES IN TEACHING FOREIGN LANGUAGES IN TECHNICAL UNIVERSITY

The opportunities of usage of modern computers and information-communicative technologies closely associated with them are considered as a tool for teaching students of technical specialties foreign languages. Large possibilities, real prospects and features of practical application of new teaching approaches in special content-based foreign language curricula relevant to students' professional field are discussed.

With the globalization of modern science and technology teaching foreign languages became an integral part of education and training of technical students. Proficiency in foreign languages is critical for employees of a number of industries such as aviation where incorrect interpretation of the terms could be disastrous. Reforming of higher school in Ukraine involves significant transformation of standards of educational programs, shaping the minimal requirements for average student competence. Due to strict time limit of classes in contemporary technical universities, a primary attention should be given, above all, not to mechanical learning of specific facts, events, words, but to studying the main principles of information structure in a particular field of knowledge, mastering of certain skills that help the student quickly and confidently navigate through the modern world among which the ability to obtain and process information is the most important [1].

The use of information-communicative technologies in education, particularly in studying foreign languages, has become the norm for most universities around the world. Information technologies including multimedia are a combination of video, audio and other display tools that are integrated into an interactive learning environment. Multimedia resources can involve almost all senses of students, combining text, graphics, video, photos, and sound. Using multimedia, students are mastering all aspects of language: phonetic, grammatical, lexical and communicative, that allows better and faster perception of the learning material to improve language skills and abilities.

Contemporary digital computers and related communication technologies today seem to be the most powerful, affordable and versatile multimedia tool. Experience in teaching foreign languages shows enormous possibilities of using computers even without an Internet connection [2, 3]. Firstly, it is a very big advantage of using a modern computer system as a powerful technical tool to show almost any visual aids. These features can be used in teaching any subject, but there are a number of particularly important points regarding the teaching of foreign languages. The most important is the crucial need for these visual tools while studying any language material. This form of presentation contributes to the transformation of a meaningful dialogue into unconscious associative links among involved concepts; it can largely compensate the lack of interaction of the students with real native speakers. Another aspect is connected with almost unlimited resources of such materials. Any visual material of professional area published in a country whose language is foreign to Ukraine may be used in a special course of this language, and modern communications, especially Internet service, provide free access to these resources. Demonstration materials used by computers are usually complex. Textual information is naturally combined with the multimedia tools that create the preconditions for perceiving this information on an emotional level.

Secondly, it is the use of computer as an effective means to store, search and process various data. Modern personal computer can store the information that requires numerous volumes of traditional paper storage: books, journals and manuscripts. This information can be instantaneously obtained, properly arranged and then stored as organized learning material [4].

Finally, the third essential aspect of application of computers as linguistics tool is to use them as teaching and controlling means for completion and subsequent automatic or semiautomatic evaluating a variety of exercises - grammar, vocabulary, and others [5, 6].

Possibilities of computer multimedia to simulate day-to-day situations far exceed traditional audio and video display means. By contrast, computers and related information and communicative technologies are able to provide effective audio-visual, extra support that can be much more adapted to real students: their abilities, rate of perception, level of previous training, etc. The computer is essentially capable of modeling and rendering of real speech situations, sometimes it is even able to provide some form of feedback.

The use of computer technology allows, in particular, to use in the learning process complex forms of work such as translation of original content based materials according to professional field of the students [7]. This to some extent creates prerequisites for the integration of academic courses of foreign language and appropriate professional discipline. There are many benefits of this combination, among which must be considered the principal:

- Using materials of professional content increases motivation and interest of students.
- Working with content based materials requires that students not only understand the information itself, but also interpret and evaluate it, develop their analytical and systematic skills, as well as the ability of critical thinking.
- Materials directly related to the professional field of study provide more opportunities for practical cooperation with language, make special terms easier to remember, reveal their true meaning, create associative links and support conditions for the contextual translation, providing innovative and fruitful environment in the classroom.
- Using professionally orientated materials provides opportunities for effective work of group of students with various ranks of proficiency in foreign language. It seems attractive to match more and less experienced students to collaborate in solving mutual task.
- Some academic time may be saved if certain topics of professional courses are delivered during the time dedicated to specialized content-based classes of foreign language.

The successful development of computer aided curriculum largely depends on the proper competence of the teacher, which supplies the interaction of each student with an educational tool and provides appropriate class environment. The introduction of such technologies requires suitable technical support. So the teacher should be proficient in both computer equipment and relevant technical discipline.

Particular attention must be paid to the use of computers as teaching and supervisory instrument. In many cases the use of a computer system enables the automatic authentication and assessment of the test results, increases their reliability, and reduces the teacher's overload. The implementation of automated systems for learning foreign languages on a large scale can lead to a true revolution in education, especially in relation to distant learning.

One of the major benefits of standard exercises designed to be automatically checked by computer is that they can be an effective tool for evaluating knowledge and competence of students. This is especially important in the case of courses with a large interval between classes, which is the usual situation in foreign-language curriculum in technical university. In this situation the student supplied with means of self-control, even in semi-autonomous mode of learning, is able to focus on issues that represent the greatest difficulty. Objective assessment of knowledge increases the confidence of students in their abilities, leads to further improving language skills. It is important that students become less dependent on direct evaluation by the teacher. On the other hand, it reduces the burden on the teacher and makes possible to pay more attention to less proficient students.

We suppose, however, that in some very important aspects of mastering a foreign language, particularly in the area of literary translation, the prospects of automation of the educational process seem to be very limited, at least in the nearest future. This field, which is essentially an art, yet is outside the capabilities of modern technologies [7].

The introduction of new teaching methods provides a means fundamentally different from traditional forms of presentation. This allows realizing the highest stage of differentiation, individualization, even in a group. It keeps learning outcomes under permanent control, and provides feedback to make appropriate correction in studying process.

Computer networking opens the possibility for direct communication with authentic native speakers in real time. These opportunities, however, are largely chaotic and not organized for educational purposes that should be taken into account while searching for specific information. Not all the information available in Internet is relevant for content-based study of foreign language. Lack of direction might become a challenging obstacle. At every stage of work with the Web resources students have to know the purpose of the task they are performing as well as the final target. Therefore, during the introduction of new information and educational tools it is extremely important to provide an adequate level of training and expertise for all participants of the studying process. Such necessary skills include, for example, the ability to write queries to search engines, select keywords, etc. Fortunately, this problem is not serious for technical groups, where the students must by definition be computer literate.

The main task of the teachers while working with modern computer facilities is to combine them with traditional means and techniques to provide fast mastering essentials and, finally, high-quality background of foreign language. The key purpose that still remains for the teacher is to supply managing, coordinating and synchronizing functions. According to the guidance concept that lies at the center of studying foreign languages, the specific types of material, both factual and grammatical, must be selected to stimulate social interaction among teachers, students and outside participants in the communication network and so to structure appropriately the educational process.

Conclusion

Simultaneous studying of foreign language and professional discipline with the use of modern teaching techniques based on application of computers as an educational tool makes it possible to considerably increase productivity of training. Such technologies help to reveal the individual capabilities of students, enhance their motivation and interest, and provide more control over learning. It gives the students much more autonomy and supplies them with the tools of self-control. The teacher in this case does not only transmit knowledge but also supplies resources, organizes the educational process, and offers support to help students develop their own learning strategies.

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S. Kharytska, PhD (National Aviation University, Ukraine)

CAUSES AND WAYS OF OVERCOMING OF PROFESSIONAL BURNOUT

Intensification of life, socio-political and socio-economic changes taking place in Ukraine today, the experts put forward new and more complex requirements, which certainly affects the psychological state causes of emotional stress, the development of a large number of occupational stress. The article gives a description of this concept as a syndrome of "Burnout" and points the ways to overcome it.

In our busy time of information glut, economic and domestic problems, unfortunately, as most psychologists point out, more people feel tired and emotional "extinct", constantly tired, like a "lost" somewhere to inherent vigor as if they left the force. At home and at work they have to do everything by force, refraining afloat with a sense of duty or economic necessity, or simply because it has already happened.

This problem of specialists of all professions that involve intensive constant communication with people. It should be analyzed in detail the basic concept of "stress", "professional stress" syndrome and "Burnout."

The term "stress" is analyzed as a reaction, which is expressed in a state of tension, depression, and there is a person under the pressure of extreme exposure. We emphasize that stress is a complex process that includes both physiological and psychological components. The term "professional stress" is defined by us as a multidimensional phenomenon, which is expressed in physiological and psychological reactions to difficult professional situation. The analysis approaches to study syndrome "Burnout" (A. Vyday, S. Jackson, L. Karamushka, N. Levitska, G. Lozhkin, K. Maslach, L. Malets, V. Orel, M. Smulson, T. Formanyuk, H. Freydenberher) this syndrome was defined as the stress response, resulting from long-term occupational stress medium intensity.

First burnout syndrome was described by American psychiatrist Freydenberher in 1974 as a special mental state of healthy people who are in intensive communication with customers, patients, and emotionally laden atmosphere in the provision of professional assistance. It is caused by prolonged participation in emotionally intense professional situations. This condition is characterized primarily for members of professions related to communication, the need to help others, compassion, solve problems for others. It is about teachers, psychologists, psychotherapists, doctors, lawyers, social workers and managers. Burnout can be considered with specific stress communication. This stress increases slowly, almost imperceptibly, but can have very negative consequences. Burnout shows a partial failure of a man to the work he performs. It happens that during the first years of work a man is happy, and he feels satisfaction from his work and its results. But after the emotional exhaustion increases, fatigue accumulates small misunderstandings with colleagues, students or customers are becoming more frequent. Then this is the work itself requires human resources are too large, excessive emotional investment. It comes exhaustion, burnout, with all its symptoms: feeling of devastation, loss of zest for life, the disappearance of interest in their relationships, their careers, and the experience of their own incompetence, constant irritation, and indifference. Burnout occurs because the overdriven person needs some way to save those few already, energy remaining. And it protects itself from depression and even more vital energy expenditure.

People, who are by nature closed, half-hearted in communication, aimed more at his own inner world, and not on others. These people are generally low self-esteem. They lack self-esteem, so they do not know how to respect others, showing rigidity and authoritarianism. Their sensitivity to the emotional states of other people or extremely low (called "thick-skinned") or too high (as they say, "naked nerves"). And if in empathy, that is compassion, no measure is not conducive to the establishment of productive contacts. There are also factors of burnout, which depend on the particular job, the status of the human collective. If a person is dissatisfied with their professional

and creative perspectives, sees opportunities for career growth, if for some reason does not take a professional company, if conflicts at work is an everyday occurrence, the risk of burnout increases. And, of course, can not exclude a role too long and heavy workload. Naturally, that raises the question: "Can you resist the burnout?" – "You can and should".

Of course, under no circumstances be canceled provided the profession attention to customers. But, having done all that is should not exaggerate the value of its own intervention in the fate of a man who asked for help to the institution where the work needed to solve its problems specialist. People, who ask for help, lived without it and will live on. It is useful to remember that reducing self-importance, the specialist professional reduces the risk of burnout.

You must also specify the differences of professional burnout in different countries, if any.

Perhaps the difference is the speed of this dangerous and unproductive state, its "malignancy" in Ukraine. Culture attitude to the health, maintaining high productivity through intelligent load alternation, better planning of the time, ability to fully rest and recover strength so far in our country is very low. One of the reasons for the increasing spread of burnout lies here. The second reason is the conditions. The best working conditions to which the majority of local specialists, especially teachers, can only dream of, involving not only worthy, appropriate sanitary conditions, availability of modern equipment, but effective leadership style. It is possible to predict complications in the relationship between employees, particularly for schools where the vast majority of teachers – they are women, who are more vulnerable and excited, and promptly remove psychological tension in the team. It is important to remember this concept in psychology as "the prevention of conflicts." It is important to resolve the inevitable disputes at work early, so to speak, a stage that they did not degenerate into a global strife. Indeed, in such circumstances, effective work becomes extremely problematic.

Workaholic, a person usually becomes workaholic himself, with this tendency, although the overall style of colleagues' work can accelerate the formation of such dependence. This syndrome evidences of excess absorption in work, "obsession" on it, the inability and unwillingness to pay due attention to relationships with friends, fun, full of self. We can see such syndrome in humans, who cannot be separated from work, who cannot rest and are constantly striving to bring to perfection the important and urgent matter production. They no longer can and cannot at least sometimes to live freely, peacefully. Unconsciously each workaholic is afraid of all ever end and he will feel the void, emptiness, and his unnecessary.

To prevent such states in the foreground, self-identity, it's ability to assess the urgency of cases correctly and promptly and the possibility of solving some of them at a later time. Urgent cases are not important, as psychologists' evidence.

Ability to work in a hard schedule provides the ability to organize their time clearly invests in certain limits, refusing of free improvisation. The creative person who wants and can work independently to make decisions, offer new ways of solving problems, usually tolerate such harsh restrictions poorly. However, diligent artist with a developed internal discipline even enjoys the ability to fit into a schedule and be on top. Resistance to stress – is the ability to maintain inner peace, switch from one task to another easily, dividing attention between multiple tasks simultaneously. Do not panic when suddenly the nature of rapidly changing time is reduced, and the head is too irritated. Dwight Eisenhower, the thirty-fourth President of the United States, stressed that urgent cases are usually not critical and important – the most wanted. That phrase must be told whenever internal panic about the fact that something is hardly managed begins. It can be used as internal brakes when haste, bustle interfere to stop and look back, evaluate and select the most urgent cases among the entire routine.

Fatigue from work – is a natural reaction of all people. But one can recover quickly without cycles to failure, while others constantly "digest" mentally challenging work situation sometimes can not even sleep at night. How can we deal with this? Excessive excitement over the work does not help to work efficiently and quickly, but it rather harms.

To recover quickly, you need to find a few ways to change the activity. This may be, for example, swimming in the river, basin, taking a warm bath or a cool shower. This may be a piece of

chocolate, a cup of coffee or green tea, a small cake, and fruit. However, some gets used so much to eat during any stressful activity, which then has a problem with being overweight. Therefore resort to comforting food should be very careful not carried away, without making this the only way to self-help. TV – is widespread acceptance of stress: watching the movie, talk show or concert. Sometimes a person says that as a result of stress he cannot concentrate on what looks, thoughts constantly crieth out somewhere in the opposite direction. But later he at least partially distracted, begins to follow the plot, musical motif or smile, listening to a joke. Among the methods of removing the work fatigue – is shopping. It often resorts women who know how bright windows, fitting, selecting renewal switch their opinions. Another method – is walking with a friend of or colleague. Suppose these are not the people with whom you can talk openly about what has happened. Even talk to some other, distant from production problems, a theme helps to overcome the "obsession" of his problems. Various creative exercises help very well, such as when exhausted and irritated working man begins to draw in the evening. It does not matter, does he have this ability or not. The main thing – to take clean paper, crayons, paints, markers and start something portray. Sometimes it will be a landscape or still life, portrait sometimes, and more often – it will be an abstract composition on the topic of today's irritation, injury to his colleague, anger at the boss. While hand is drawing, mind is calming down. Sometimes you can even write an open letter that will never be sent. Internet with its many features, entertainment is very helpful for someone. We suggest looking through reference sources to the profit away from problems, tell how to travel new editions of fiction or simply provide some new information or explain the strange phenomenon or condition.

This method of self-help support people in really difficult situations. It is better to be workaholic than to get alcohol, drug addiction or to depend on computer games. But it is better not wait personal problems, hiding into the employment and try to decide them until they "destroy" the very man.

Conclusions

Modern prevention of burnout includes three areas:

The organization of activities.

The administration should provide employees opportunities for professional growth, provide social package to boost motivation. Obligations prescribed in job descriptions should be clearly distributed. Organize your time and place - it is also important for burnout.

Improving the psychological climate in the team.

Creating psychological comfort in the professional group, a group that exists as a unit. One of the best destructive psychological comfort factors is very low financial situation of employees. But the solution to this issue can be found by expanding the horizons and aesthetic needs of the individual, as a result of increasing tolerance and understanding.

The work with individual characteristics has three divisions: creative thinking, the leveling influence of negative professional and personal factors of self-regulation skills.

Creativity is the strongest factor for the development of personality, famous for its willingness to change, abandonment of stereotypes. Leveling – is the ability to resolve conflicts and find constructive solutions. This can be used various kinds of trainings, organized leadership. During such training self skills (training equipment control their own physical and mental condition) can be formed simultaneously.

Prevention should be comprehensive, well organized, aimed at correcting disorders of mental state and, if necessary, to improve the psychological climate of the team. Knowledge of stages and factors of burnout will allow specialists to treat more seriously the timely prevention of the mentioned syndrome.

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N. Chaika Ph.D., O. Lysenko (National Aviation University, Ukraine)

COMPETENCE AND SKILLS OF MANAGER AS A BASE OF "ADMINISTRATIVE MANAGEMENT" MASTERS DEGREE TRAINING MODEL

There were defined the characteristic differences in the construction of educational models on the basis of students' basic skills which are necessary in the further managerial work. The list of skills and competencies which have to be acquired by masters of administrative management was defined on the basis of necessary manager qualities analysis.

The urgency of the problem is that in today's demanding and rapidly changing social and economic environment the high education level largely depends on the effectiveness of new learning technologies implementation. Respectively, today educational technologies should be based on modern methodological principles, teaching principles, psychological and educational theories, and, necessarily, be implemented with the assistance of the most modern computer equipment and programs that, in general, provide building training programs competent approach.

They form a characteristic tendency to enhance the practical orientation of theoretical education, its approximation to the actual production process and the realities of modern life.

The purpose of the article is to define the necessary skills of future leaders that will outline the basic methodological approaches and requirements to be met by technology education in master specialty "Administrative Management".

New social and economic relations require the leader personality role strengthening in the workplace, awareness of the need to update and improve administration technology. One of the main tasks of the administrative bureaucracy is the efficient activity organization, both public institutions and private firms, their business units. This can be achieved by improving the management process. The present-day manager shall to have a clear picture of its own process and perfectly know the structure of administrative and managerial staff and their departments, as well as psychological characteristics of the collective and the individual in particular. This requires a rethinking of existing approaches of the developing studying programs in higher education in general and especially in preparing managers of administration, that is senior staff specialists.

The main objective of educational technology training in administration is to optimize the process of professional training, which requires specified levels of professional competence (skills, abilities and ability to apply them) and education (special knowledge and personal qualities) that will ultimately determine the quality of training and education.

Thus, constant combination of theoretical material and the acquisition of relevant skills and knowledge needed to further work in leadership positions have to be implemented in constructing of a model.

The technology is based on certain methodological principles: system, controlling possibilities, personification, visualization, efficiency, recovery.

Educational technology systematic is that kind of technology which has to be characterized by all system features: the logic of the process, the relationship of its components, integrity.

Opportunity management provides for diagnostic goal-setting, planning, designing learning, phased diagnosis, varying means and methods to correct results.

Personification of the educational process provides personal guidance in choosing the direction of theoretical and case studies within the general model of learning.

Visualization involves the use of audiovisual and computer facilities as well as the construction and use of various teaching materials and original visual aids for rendering the results of research and development.

Efficiency. Modern educational technologies exist in a competitive environment and shall be effective on the results and optimum cost to guarantee a certain education standard achievement.

Reproducibility of educational technology is the opportunity to use (to repeat or to recover)

the educational technology in other identical educational institutions and other entities.

Masters degree in "Administrative Management" course refers to an interdisciplinary integrated part of economic and liberal arts which have the task of teaching, methodological, philosophical and general cultural top managers training.

Methodological thesis which is underlying educational course is determined in the following components:

- improvement of organizational processes and organizational culture in the modern labor unions;
- passing to flexible organizational structures, interaction of communicative and psychological management technology;
- dependence of the labor unions success on their ability to change;
- awareness of the man prominent role at work, position, activity of which largely determines the organization efficiency;
- increase of social responsibility to the community labor union, etc.

Combining the teaching principles of standard and methodological thesis as a base of masters degree course in "Administrative Management" essential task was to identify a list of important skills a professional head of the administrative and managerial staff for the modern competitive organization.

General model of basic professional and managerial skills consists of basic skills. Skills consists of related abilities and basic knowledge, which allow the person to make additional cost to the overall scope of the obligations at work. Abilities are one of the elements of skills - a specific set of capabilities.

Summarizing the analysis of highly skilled managers activity, scientists agree on the basic skills definition. Analysis of approaches to managers professional activity development (A. Derkach, A. Zhuravlev, V. Rubahin, O. Sventsytskyy, A. Sitnikov, L. Umansky, G. Shchekin, M. Weber, P. Drucker, R. Likert, E. Mayo, F. Taylor, A. Faiola) made it possible to identify it as a system of components consisting of a set of functions. They implemented by the managerial activity individual with inherent personal characteristics depending on the particular situation. The analysis of approaches concerning the development of professional managers activity taking into account peculiarly and content of specific management type has allowed to determine the managers administrative activity as the complex process of consequent implementation designing, organizational, managerial and executive functions. Its carried out by implementation the knowledge system of these activities the subject of skills within the specified competencies.

To achieve the overall goal of the organization managers have to master the necessary basic skills, which can include the following: mobilizing innovation and changes, people management and affairs, communication, application of modern management technologies and self-management.

Tne innovation and changes mobilization is the basic skill that includes ability to examine ideas and strategies in the context of present and future and the ability to initiate improvements based on a systematic evolution of risk associated with these ideas and strategies. This ability includes interrelated skills such as conceptualization, creativity, vision and riskiness.

Conceptualization is the possibility of combining information from different sources, the ability to adapt it to the general situation and the ability to use it. Individuals with these skills are able to identify key issues and make their diagnosis by examining basic questions "who" "what," "why," "when," "where" and "how."

Creativity is the ability to introduce innovations offer new solutions to problems, show initiative and adapt to changes and rethink the role in response to the organization and / or one or more departments.

Riskiness is the desire to use this opportunity by recognizing and highlight opportunities and recognizing their potential negative effects, and highlight progress towards the goal.

Vision is the ability to properly assess the potential of the organization and / or one or more units and finding innovative ways.

Managing people and things is the basic skills associated with many traditional functions of

management, is now increasingly practiced by providing government employees and teams. This skill includes the following interrelated abilities: planning, operational decision-making, organization, leadership and conflicts management.

Planning is the ability to set goals, identify tasks that need to be solved to achieve the objectives, delegate authority, to cover the progress in implementing the plan and review the plan considering new information.

Decision-making is the ability to choose an effective course of actions based on a thorough assessment of their long-and short-term effects, the ability to provide political, economic and ethical results of activity and isolate people and groups that fall under this influence.

Organization is the ability to develop the composition of individual works, organizational departments and processes and integrate them to achieve organizational goals.

Leadership is the ability to create a sense of direction to others in this direction and delegate responsibilities so that it effectively motivated people. Leadership has many aspects. Some are related to employees recruitment, evaluation and reward. The essence of leadership is that it combines the needs of people and purpose of the organization and its units.

Conflict management is the ability to identify sources of differences that lead to conflict and constructively solve it. Conflict management involves negotiations with external members - customers, suppliers, unions and government.

Communication is the basic skill including ability to send and receive information effectively and the ability to share and understand thoughts, feelings and attitude. This skill includes the following interrelated abilities: interpersonal communication, listening, verbal and written communication.

Interpersonal communication is the ability to interact with other (older, same age, subordinates and customers).

Listening is the ability to be careful when anyone says, and effectively respond to their comments.

Verbal communication is the ability to provide information orally to the other (face to face or in group).

Written communication is the ability effectively transmit information formally (through reports, letters) or informally (notes, memo).

Ability to communicate can be called a circular system that feeds the other skills. Sexual, cultural and ethnic diversity requires new communication skills.

For example, as it turned out, the phrase "to solve problems in business" differently translated into Chinese and French. In China, it can mean "to produce the product and download it before." In France, this phrase means "to be involved in the production, marketing, promotion and sale of the product." Since many words and phrases translated differently, you must find a way to interpret the same words, regardless of country and language. Sometimes, to clearly understand and define criteria, companies have to create their own international dictionary.

Use of modern management technologies is the basic skills, including ability to apply specific methods, procedures and techniques in a specialized field. Engineers, marketing specialists, tax officers, programmers and other specialized professionals must have technical skills. They accumulate both during training and in the process. Managers use the limited technical skills, depending on the existing problems and tasks they perform. The need for technical skills change with increasing responsibility of manager. In general, subordinates to promote as a manager because of their technical skills. Managers of the first category must have sufficient technical skills to train new employees and supervise the technical aspects of work. The increase of managers responsibility requires less detailed knowledge. However, they must keep up with changes by mastering new management technologies and use new information.

During the implementation of total quality management (TQM) many managers and employees have to learn a new philosophy of management, new management system and new techniques and tools.

For example, we present four methods and tools in the program TQM that require new

technical skills:

- the current chart that converts data into information by applying a variable in time;
- Pareto-chart is a scheduled columns that depending on the importance classify causes, sources and types of problems or opportunities;
- Tahuchi methods, which are statistical technique of the experiment to determine the best (with the lowest cost for highest homogeneity) a combination of quality and process variables to produce the product;
- "Starting point" is an ongoing process (clearly outlined a series of steps and procedures) evaluation of services and products compared with organization products and service - the industry leader, which taken as a starting point, a base.

Self-management a basic skill that involves understanding yourself and your environment, motivation and managing your own career and ability to cope with the changing and ambiguous situations and adapt to them. This skill includes the following interrelated connections.

Training is the ability to acquire knowledge from everyday experience and to keep pace with the development of their own industry.

Own time management, which includes solving several problems simultaneously by effective prioritization and allocation of time to implement them in time.

Personal attributes which consist of a variety of personal characteristics that help people to cope with everyday working situations. For example high energy level support, self motivation, functioning at optimal administrative level, overcome stressful situations, maintain a positive attitude, ability to work independently and adequate response to constructive criticism.

Ethical standards - beliefs and behavior of individuals in situations related to values and moral judgments. Self-management is a key skill for everyone in the organization. Now is not reasonable to think that organization alone will satisfy the needs of workers in developing, training and career.

Conclusions. Summarizing all the above, we should note the following.

In modern national system of higher education there are innovations both practical and theoretical levels. One of the most important strategic aim of higher education modernization in Ukraine is to ensure the quality of managers training at international standards level. Solving this problem is possible only with the introduction of competitive approach to building educational programs qualification level of master degree.

The main task of teaching technology in education course on "Administrative management" (master degree) is to obtain established levels of students' professional competence: skills and abilities to apply them in production activities. Building a program takes into account the teaching principles of the state standard, the basic methodological principles of the course and competitive approach in the learning process.

The purpose of this activity is increasing efficiency and quality of education, formation and development of intellectual, creative, competent individual of future leaders. Acquiring the skills necessary for administrative activities: mobilizing innovation and change, managing people and business, communication, application of modern management technologies and self-management, provides significant practical and scientific research, holding student conferences, publications in scientific journals. Thus, training in the direction of master degree in specific categories allows gifted students to express themselves as researchers, to show their analytical abilities.

The rapid growth of the role of administrative staff in the modern social and economic systems activity over the past half century has led to a paradigm shift and the essence of management. This situation is caused by changes in the structure, content and purpose of social production, and peculiarly modern organizations (orientation activities: public administration, industry, service sector, leisure, ownership, market places, etc.). Because the needs of modern society are not limited to the presence of managers who perform basic set of functions (planning, organization, motivation, coordination, monitoring, etc.) and require their high competence concerning the contents of a managed organizations in general and the specific features and direct management features.

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S. Ordenov, Yu. Kazarinov, Ph.D. (National Aviation University, Ukraine)

APPLICATION OF COMPETENTIVE APPROACH IN THE TRAINING SYSTEM FOR THE PROJECT MANAGER DURING TEACHING THE ACADEMIC DISCIPLINE "INTELLECTUAL PROPERTY"

A number of factors, which form a certain algorithm of educational activity and the process of formation of specialist professional competencies are considered in the report. The importance of the development of monitoring tools for the knowledge assessment of the specialist and the achieved level of the professional qualities and competencies of his/her is emphasized in it also.

In the educational sector, the problem of competence arose after some mixed responses from the current market of labor to the lack of knowledgeable new entrants in relation to key competencies. Today, the working at companies in a highly competitive environment requires from an employee not only the ability to use the existing technologies and skills, but also to be prepared to changes and adapt to new labor market needs, to act quickly and make decisions, operate and manage information flows, hold responsibility and the most importantly - to be open to new experience and be able to learn more an more throughout the period of work. These factors, and transformation processes in all forms of society development, have undoubtedly affected the education sector. It is a fundamental and generating component of belief of a personality, creating new educational goals and changing the long-standing strategic objectives. Along with the existing paradigm, which is knowledge, abilities, skills (KES), this process updates the concept of student competence in terms of his/her future professional activity.

In the current educational system, the studying purposes are not only to learn the principles of science and vocational-oriented transfer of knowledge, but also to create conditions for self-determination and self-identity. Only under these conditions, the society will have a real person, and a company will have a qualified employee. Therefore, the teaching objectives include both the transfer of existing objectively and scientifically stipulated facts and the formation of the student's subjective and personal values of the received information, which is consistent with his personal goals and motives of self-study.

Those factors, within the competency approach, determine the forms of educational activity. They are associated with the formation of meaningful knowledge for a student that can be achieved by converting the momentous information into his/her personal opinion, and onward - to his/her activity. This transformation can be realized only if the information will be assimilated by a student as a practical mean for his/her future actions, being a unique resource and a powerful tool for solving subject-technological, socio-cultural and professional issues.

It should be noted that the relevance of the subject context of teaching and integration of the competency approach in the teaching process is caused by the adaptation of the Ukraine's education system to the current requirements of the society, as well as by compliance with the Bologna Process, as it is integrated into the European educational space.

The analysis of publications devoted to the competency approach allows us to conclude that the terms "competence" and "expetise" are not identical and render different aspects of the process. Thus, the competence can be defined as a certain standard - a system of clearly defined indicators of a specialist’s work, his/her rights, responsibilities and duties associated with his/her official job description. Regarding the expertise, it is seen as subjective integrated indicators of a personality, describing his/her ability and commitment to an occupational life. These features are based on the knowledge, experience and socialization acquired in the study process and focused on the self-made and successful utilization in future carrier.

The above mentioned factors indicate on the complexity and multi-structural nature of these polycomponent concepts. Thus, in terms of social relation, social core competencies may be defined as those contribute to the most complete self-actualization and assimilation of a human being to the

modern dynamical and transformational environment. The analysis of the social and business relations brings its own criteria for the expertise assessment of a human being based on certain qualification requirements and subjective-behavioral aspects of an employee. The education in this process, being both directly as forming on the part of the society and as transforming by the subject or sector orientation component dimensions, determines its competences based on cognitive, affective and volitional aspects. This takes into account both the potential qualities and capacities of a student and his/her skills to accomplish the tasks and analyze the substantive issues and select approaches to address them, which are acquired in the process of learning.

Thus, from the pedagogical point of view, the competence of a human being is a specially structured and organized set of knowledge, skills and attitudes acquired in the process of learning. The acquired competencies allow a person to define, identify and solve problems which are specific to a particular activity, regardless of the context of a particular situation. Thus, the expertise, as a subjective characteristic of a student, is a set of integrated components that describe the quality indicators of a man's activity during the implementation of a problem task. These indicators have a dynamic nature and an ability to qualitatively vary under the influence of educational technologies changing over time.

The formation of professional competences consists of a number of factors, creating a certain algorithm of educational activities, the implementation of which is associated with the following steps:

1. Identification of key competencies, which is a universal quality and overall personality skills needed for effective work in various professional and social sectors.

2. Identification of the main professional competencies of future professionals, based on the analysis of the experience of representatives from industries and occupations particular with regard to core competencies

3. Emerging educational goals and learning content based on specified professional competencies.

4. Development of standards specialties, curricula and syllabuses for each of the disciplines conveyed by a student during his/her studies, taking into account the professionally important features of a future professional.

5. Integration of educational technologies in the system of context studies for training a specialist for specific industry.

6. Assessment of a student's integrated quality score, which includes his/her acquired level of knowledge and skills, as well as a subjective and personal description of his/her creative abilities and preparedness for professional activities. This indicator shows the level of his future, professional competence.

Following the logic of this process, we will determine professional competences of a project manager. Thus, the project manager expertise is based on a number of professional features, which are as follows:

- ability to manage projects of lesser complexity within the existing elements of project management skills;
- responsibility for all aspects of project management;
- use of processes, methods, techniques and tools of project management.

The main functions of the project manager include project planning, project management, project monitoring and control.

These functions are resulting from the goals of the project operations, and creating the content and structure of actions purposed for project management. Thus, the Japanese project management standard R2M splits project actions into three components:

1. actions aimed at creating a project product.

2. management actions directed at the project implementation, which are based on coordination and harmonization of business processes and controls, in accordance with the goals and objectives of the project.

3. continuous organizational actions consisting of human resources and general management.

All project actions are interconnected with one other in parallel, they have a complex structure and require from the project manager to have a number of qualitative features such as: ability to analyze and make responsible decisions, professional actinogenegis, a large array acquired knowledge and skills, and the most importantly – to understand a role of project processes and their impact on the outcome of a project product. Most of these qualities can be possessed only in the course of professional career, however the basic foundation for future expertise should be formed during training activities. Therefore, the main tasks of the professional project manager have been reflected as components of education and qualification characteristics and had impact on the content of the education and vocational training program for this specialty.

Thus, the education and qualification characteristics (EQC) establishes qualification requirements for social and business activities of a university graduate with specialization in project management, as well as a qualification level and statutory requirements to properties and qualities of a person who has obtained a certain educational level for appropriate area of occupation. The Standard EQC ISHEU "Educational and Qualification Description of MBA Degrees for 8.000003 -" Project Management" defines four business functions of the Project Manager: design, organization, process and control, each of which includes a set of typical tasks and skills.

An important part of the educational process is to how assess the acquired knowledge and how a student has possessed his/her professional skills and competencies. Within the context studies, a system of tests is one of the most effective means of control. The developed and subject interrelated tasks (tests) form a multi-level system of test control and allow quite quickly and accurately assess a degree of a student's understanding of the place and role of his/her discipline in the system of professional education, and basic components of interaction processes among the acquired knowledge and skills and other disciplines of professional training.

In order for the system of tests to really get in line the specifications set above, a teacher, while developing it, should take into account several factors associated with the integration of those tasks in the system of training for specialists of that profession, and with the definition of subject competences of his/her discipline and methods of control.

Conclusion

The training contents and methods of construction of academic discipline «Intellectual property» correspond to the criteria of the context training. It in conjunction with other normative academic disciplines forms a system of professional training of project managers.

This discipline is the theoretical basis of the integration of knowledge and skills on intellectual property. It forms a profile of specialists on project management in the field of creation, use and protection of intellectual products.

Knowledge and skills obtained by students in the study the academic discipline "Intellectual Property" will be used in the future to study the interrelated subjects of professional and practical training, as well as in writing a diploma work.

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Vdovenko L.I., Kleshnya G.M. (National Aviation University, Ukraine)

FORMS AND METHODS OF ACTIVATION OF EDUCATIONAL ACTIVITY OF STUDENTS DURING TRAINING MASTERS IN MANAGEMENT

On the basis of analysis of the major active forms and methods of organization of training activities in the modern high school approaches to selecting the most appropriate methods for specific activation of learning activities of students in the preparation of masters in the "Project Management" and "Administrative Management" subject to certain general requirements for the formation of the necessary competences of managements' personnel.

The object of research facilities is formation of competentive characteristics specified standard of higher education VNZ-05 "Standard of higher education of higher educational Institution. Curriculum".

The subject of research. Methods activation learning activities of students during the preparation specialists in specific categories.

The problem. Comparative analysis of modern foreign educational systems and technologies and scientific research in pedagogics [5] allow concluding that one of the major ways of developing education systems today remains:

- constant updating of the content of higher education to better support demands of society;
- formation in student professional and social personal qualities that would allow him to fully realize their intellectual potential.

An important feature during the preparation professionals of specific categories is the need to take into account the significant differences during the preparation specialists with basic education, technical, humanitarian or economic profile. In the works of modern authors we can see the analysis of perception of information in ensuring the success of educational activity of students [1, 6, 7, 8]. In this context, the urgent task of modern psychology and pedagogy of higher education is detection and use of the regulatory role of various psychological properties to ensure the success of the educational process.

Considering the significant differences in the basic education of students of different profiles we take into account the following features:

1) specialists with a basic (not completed higher) education, technical, humanitarian or economic profile have the competence characteristics of different degrees;
2) ability of the student, as a natural inclination to a particular activity, talent, or individual characteristics that are subjective conditions of successful productive activities;
3) the effectiveness of learning activities has a clear dependence on intellectual capacity, which is defined as a person's ability to analytical and synthetic processing of educational material.

Coordinator of the group project activities must take into account not only a substantive knowledge but also individual psychological, social and psychological factors that influence group project activities.

One of the most important conditions for successful educational activity are intellectual potential, which is defined as a person's ability to analytical and synthetic processing of educational material [1, 2, 3].

In accordance to the requirements for training in the leading countries graduate - manager must be knowledgeable expert in various subject areas of advanced analytical training, ability to use scientific methods of analysis, expert and prognostic assessments, high level language training. This defines for future of the graduate mainly a diagnostic activity (for a class of problems) and in some directions - heuristic (on the creative level). To ensure these requirements within the state standards and normative of higher education course of study is impossible without the use of active educational methods (AME).

In this context will be actual selection of some of the most appropriate methods for activation

of educational activity of students in the preparation of Project managers and managers (administrator) of administrative activity.

Review of recent research. The acceleration of learning in higher education, ranging from 70 to 80 years, was researched completely, including by modern experts [1. 2, 3,]. Separately are considered the requirements for professional competence of masters' of project management [4, 5, and others.] as a combination of knowledge, skills, experience, personal qualities, which allows to act independently and responsibly perform certain professional functions in accordance with accepted at this time norms and standards. At the same time consideration of approaches to the selection of some the most appropriate methods for intensification of educational activity of students in the preparation of Masters' of specific categories including some general requirements for competence so far considerable attention has not been paid.

Research objectives is to determine on the basis of analysis of the major active forms and methods of training activities in the modern higher school teachers, carried out experiments (PE), the individual most appropriate methods for intensification of educational activity of students in the preparation of masters' of Project Management to meet the requirements for professional competence and characteristics of management training.

The main material. The main requirements for modern graduate of the university, besides professional knowledge, skills and abilities also became competence and mobility. In this regard, the emphasis in teaching educational disciplines are transferred not only to formation of knowledge, skills and abilities from the teachers' side, but also to the process of of cognition, the effectiveness of which entirely dependent on cognitive activity of the listener (student, Master) which can be significantly increased using AME. They activate the independence of opinions of students, engage them to work with large volumes of information, create an atmosphere of mutual understanding and empathy, making them the real subject of training.

In the formation of competence a decisive role is played not only educational content, but also educational environment of higher educational institutions, organization of educational process, educational technology, including the individual work of students, etc.

Within eight year term is made educational-pedagogical training activities at the Department of Technology of Management. At the same time annually changing not only the quantitative composition of the students with basic technical and humanitarial education. Their qualitative composition is also changing.

These changes demonstrate the need for of mobile adaptation of curricula to meet the needs of students with different organization of associative series. Because students not able to combine different qualities of the same object simultaneously, but only in pairs to form the priority between signs, by logical considerations. The image of formation of memory brain differ significantly in individuals with right-and left part of brain activity. The purpose of first category of individuals is the optimization, conversion to generalized formula or algorithm, and of others is seeking to expansion of knowledge about the subject. Thus in one case the effective is a form of teaching in a compressed format, and in another case for better memorizing is more reasonable large, expanded analogous and more exquisite.

Revitalization of training activities can be carried out as improvement of forms and methods of of training and by improving the organization and management of educational process higher educational institution.

An important role in ensuring the revitalization of the educational process at the department, under such circumstances, play two factors: first is using of active educational methods (AME), and secondly, the use of modern technical means, including use of technology Apple's process of preparing Masters'.

History of active teaching methods established by Aristotle and Socrates. Special role in the modern formation of the active education was development of games-technological movement that appeared after the birth of business games. The first in the history business game was designed and performed M.M. Birshteynom in the USSR in 1932. The method immediately received recognition and rapid development. However, in 1938, business games were banned in the USSR and their

second birth was only 60 years after the first role-playing in the U.S.

Classical classification of AME has developed at the end of 80th years in the future authors of papers on the subject mainly exist on sufficiently similar options grading professors O. Smolkina and M. Novik.

Smolkin provides the following definition of AME: "It means teaching and activation of cognitive activity of students to encourage their active intellectual and practical activity in the process of mastering the material, when active, not only teachers, but students. AME aimed mainly at teaching not ready knowledge and their reproduction, and self-study by students of knowledge in the process of active cognitive activity ".

Approaches to the system using AME set out in the theory of active learning. According to M. Novik, AME from the traditional is distinguished the following features:

1. Compulsory activity when the student is forced to be active during educational activity independently of their wishes.

2. Activity has not a short-term episodic character and it is compared with the student's full-time engaging in to educational process.

3. Students are constantly interacting with the teacher (educational automated system) using direct and inverse relationships.

4. Provides independent creative activity with increased degree of motivation.

Most often distinguish such principles of AME:

1. The Problematic. Putting the listener in a problematic situation for the exit of which (for a decision or formulating) his is not enough of existing knowledge, and he forced himself to actively create new knowledge with participation of the teacher and other students.

2. Adequacy of teaching-cognitive activity of the nature of future practice (job) tasks and functions of the listener (contextual learning). This is especially true for personal communication, business and professional relationships. Because of its possible formation of emotional and personal perception of the listener future professional activity.

3. Mutual learning. The key point of many forms of learning using methods of active learning is a collective activity and debates in discussions form. This principle does not deny the individualization of learning, and requires their skilled sharing. Numerous experiments have shown that the use of collective forms of education is even greater influence on the listener than the factors predictive nature.

4. Individualization. The requirement of teaching and learning activities tailored to individual abilities and capabilities of students (excluding leveling). Customization also implies the development of mechanisms of self-control in students self-learning.

5. Research problems and phenomena in question. The implementation of the principle based on the ability to analyze, summarize, creative approach to the use of knowledge and experience ensures the skills necessary for successful self (is particularly important for future managers).

6. Spontaneity, independence of interaction of students with educational information. In traditional education a teacher serves as a "filter" which passes through a educational information. When activated it goes to education level and students involved in the process of their interaction with educational material, ideally, the teacher becomes the head of the independent work of students, implementing the principles of pedagogy of cooperation (as the terms of the principle realisation).

7. Motivation. Active teaching and learning activities of students developed and maintained system of motivation. This basic kinds of motivation, that used by the teacher:

professional interest;

creative nature of teaching-learning activities;

competition, during the gaming method of education;

emotional impact.

Under problematic content and creative nature of competition is intense deployment reserves. Emerging with emotions involve to motivation of the listener to focus for activity.

Imitating methods based on simulation of professional activities. They, in turn, divided into

non-gaming and gaming techniques. In non-fiction methods include case study, simulation exercises, trainings. The most common methods include playing business games that are distributed on a purely academic, industrial and research.

Educational games also have different grades and types of options. Production, research and innovative games belong to a common group problem-business games. Gaming techniques during practical training in the education system were active proliferation in the late 80's, primarily in teaching social sciences. In fact, business games - a comprehensive methods that implement the entire set of elements, and thus enhance the full range of principles that are specific to AME.

In AME, which make up the largest part of the educational process and the method includes projects based on the development of cognitive and creative skills that require self-construction of knowledge and guidance in the information space. Since by definition the project is a collection of certain acts, documents, plans to create a real or theoretical objects, this method involves learning activities on the creative level study in cooperation. This model is for small groups of students. Learning objectives are structured in such a way that all group members are interrelated and interdependent, but quite independent in learning and teaching material addressing problems;

constructiveness (one of the most popular in the West, AME). The theory of the method developed on the basis of work of Piaget, Vygotsky, Payperta. According to this student is an active member of the learning environment, took part in its formation, is responsible for motivation, not only personal but also promotes educational motivation other members (corporate) educational environment.

In addition to "education in cooperation," often can hear the name - interactive teaching methods (IMT). It is considered that IMT different from AME nature of the interaction partners in the process.

AME - a method in which listener takes the subjective and active role with regard to the teacher, other students and / or individual learning tools: the computer workbook or tutorial.

IMT - a method using which the audience receives new knowledge as a result of positive interaction with other students. Positive interaction - the basic principle of interactive (collective) learning methods, the essence of which is to achieve the result of all efforts of the working group (team), but with individual accountability and responsibility of each team member. This method is very actual for mastering the art of project management. In fact, we can assume that IMT is one of the kind of AME.

Individually-oriented approach allows to introduce in the educational process of active learning that contribute to students' creative abilities of the students, thinkings, the ability to integrate to modern society which is rapidly changing. Emphasis is done on group and even kind of work that "crowd out" frontal form of work. As the most appropriate technology of education serves education in partnership, project method, using such types of activities that cause emotional relaxation of students.

Choosing a method of teaching, the teacher must realize that the main subjects in the study - a formation of knowledge, skills and training and development of students. Each of the methods used in teaching practice, has its advantages and disadvantages, but their use in the system, the relationship will help achieve the best results in the assimilation of knowledge and students in developing their mental activity.

Active learning methods can be used at different stages of the learning process. Depending on the orientation, the active learning methods are divided into:

- Non-simulation;

- Simulation involving usually a professional training and skills, and abilities associated with the modeling professional activity, in other words, a simulated as situation, so and professional activities;

- non-gaming, which provide analysis of specific situations; solution situation tasks, exercises, individual tasks;

- gaming, playing roles (role-playing, business game).

The difference active educational methods from the traditional is that they help to activate

students' thinking. According to A. Verbitsky, it forms the active learning in students' cognitive motivation, but the focus should be not a "compulsion" to the activity, and to inspire it, to create didactic and psychological conditions of the generation activity in the individual cognitive activities [2;52]. Thus, according to A. Verbitsky, the term "active learning" marks a transition from predominantly regulatory, algorythm, programmable forms and methods of teaching process in higher school to the research, search, performing a product of cognitive motivation, interest in future professional activity, providing creative conditions in education.

"All that I get to know, I know what I need and where and how I can apply that knowledge" - is the main thesis of the modern understanding of project method, which involves many educational systems, that are seeking to find a reasonable balance between academic knowledge and pragmatic skills [11;74].

In work on the project each student contributes to its implementation depending on the knowledge and personal interests. Everyone is equally responsible for the project and for submitting of theirs results of work. The activity of students has purposeful, meaningful character. Students interact with each other and with the teacher, whose role varies from controller to an equal partner and consultant.

The inclusion of this method to the learning process encourages the development of cognitive interest. According to G.I. Schukinoy, the cognitive interest can be described as "a complex relationship of man to the objects and phenomena of reality, in which expressed his desire for a comprehensive-depth research, learning of their essential properties" [11;17].

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I.O. Pylypenko, postgraduate student (National Aviation University, Kyiv)

FORMATION OF COMPETENCE IN PROJECT ACTIVITY PLANNING UNDER CONDITIONS OF VARIABLE RESOURCE LIMITATION WITH THE HELP OF "PRIMAVERA" SOFTWARE

The article considers formation of competence in project activity planning in the process of project management specialist training based on project realization process modeling with the help of "Primavera" software using the innovative approach of variable resource limitation for further project implementation graph optimization with a detailed analysis and report of the changes made.

Innovations implementation has become a mandatory tool in the struggle for leadership in modern highly competitive markets. The tendency to reduce the duration of product life cycle continues invariably, which requires constant adjustment of businesses and improvement of existing solutions. Under these conditions, the high level of uncertainty in the process of project plan developing and a large number of changes during project realization is becoming a typical feature of innovative projects.

The nature of innovative projects implementation has acquired specific features. There are almost no cases of project implementation according to a previously designed detailed plan. In real conditions the project manager encounters the need of constant changes and optimization of the project plan within the framework regulated by the contract. This task requires the project manager to have a high level of competence in project activity planning and change management.

According to current market requirements, the basic project activity planning course in the project management specialists training program, which ought to ensure the necessary level of competence for successful project implementation, is no longer sufficient since it does not include classes with application of acquired knowledge in situations of project plan changes. It is also necessary to form the ability to analyze changes and resource limitations in the project with their further optimization.

Acquiring this knowledge in the process of education is only possible if we create models that reproduce the specifics of comprehensive projects with clearly defined resource limitations and enable the analysis of the changes made at the stage of project realization. The system must provide sufficient speed of model development within the academic hours allocated for the course.

In order to model the process of the project realization with the changes of project implementation conditions it is proposed to use a variable resource limitation approach. Using the approach involves two stages: "Creating a project model" and "Application of the variable resource limitation approach."

Creation of a project model

The project model, with the help of which students can analyze variable resource limitations, should include a list of variable factors of the project through the optimization of which the project will be managed. To fulfill this condition it is necessary to form initial data before the development of the project model.

Initial data for the planning stage should include a summary of the project and a list of limitations that regulate the project. The basic list of project model creation limitations at the planning stage provides information about the duration of the project, the project cost, OBS and WBS structures, and workforce and material resources limitations to be applied in the project. There shall also be a list of project activities describing the technological sequence and intensity limitations of their implementation with the help of project resources. Using data concerning the limitations students can create project models by themselves.

Firstly, in order to apply the approach students need to develop a detailed comprehensive plan of the project. Comprehensive planning involves distribution of the project plan into the following blocks: design, tendering, delivery, major project activities and others. Comprehensive planning

enables to model the situation with the emergence of changes in different groups of project activities and keep track of their interaction. The results of activity packages interaction analysis in project realization gives students an illustrative example of project implementation specifics on the principle of network planning, which significantly increases the efficiency of specialist competencies and skills formation.

Secondly, there should be a list of resources necessary for the project implementation with their further distribution into activities, as well as quantitative and cost estimation. This data must be compared with the initial data and optimized within the task.

Thirdly, in order to enable project analysis it is necessary to create a target project plan, i.e. a copy of a model with time, resource and cost indicators. When creating a target plan one should clearly define the mechanism of data analysis and create a list of project milestones.

Application of variable resource limitation approach

The second stage of variable resource changes approach also regulates the formation of the initial data. They include a list of influence factors which will be the subject of student research.

Influence factors are events that cause changes of the basic limitations such as:

1) Time limitations.
2) Financial limitations.
3) Workforce, nonlabour and material resources limitations.

Typical examples of factors of influence include violations of financing schedule, delay in a certain project activity package, temporary absence of project management group members, delay in project documentation issue, delay in project supplies terms, detection of significant defects of project activities and others.

In fact, influence factors can be classified as project risks. Only by using a comprehensive project model can students have the opportunity to conduct qualitative and quantitative analysis of influence factors, examine their influence on each part of the project and plan anti-risk measures [1]. The list of influence factors should assume their variability, i.e. focus on the change of different kinds of basic project limitations.

Students must take turns to model influence factors of the project according to the task and perform project analysis in order to determine deviations from the target plan. As a result of the analysis they should prepare a report on the progress of project implementation describing the changes of all the basic project limitations.

The next stage is the optimization of project limitations in order to ensure project implementation according to the initial data. To provide project realization modeling it is only allowed to optimize that part of the project which is performed after the influence factor emergence. Optimization phase also includes a report on the project progress with a list of changes in the implementation plan. This report is the initial information for changing the plan for the project management group and coordinating all the participants of the project.

In case the planned time reserves are not enough to level influence factors a report should be made according to the procedure of project change management [2]. The deficiencies detected in project implementation plan are to be recorded and the project model is to be fully changed.

Application of "Primavera" software

Using the variable resource limitations approach in project realization without applying modern powerful planning and calculating automation system implies significant time spent on project modeling on the principle of network graph construction, making changes and calculating changes of all the project milestones. The time required for the development of each model within the individual approach by far exceeds the time allocated for studying project planning in the course of project managers training.

Project Management module within the "Primavera" software package is a powerful tool for multi-project planning and monitoring, which operates on the basis of MS SQl, Oracle and provides the possibility of scaling project management system in an organization [3].

"Primavera" Software enables the development of a detailed comprehensive project implementation plan using network approach. Automated mechanism of calculating the project

resources usage given the limitations saves time for quantitative and cost estimation of the project.

One of the features of "Primavera" software is a possibility of saving the project plan as a full copy of the project model with a possibility of further changes in the original copy of the model. This feature provides the comparison of a basic project plan with the project model after the application of project influence factors and direct optimization the basic plan without changing the actual state of the project.

Another advantage of the program is a wide range of project analysis mechanisms and notifications about project changes. Customized reports of the project according to the requirements of the project milestones enable to carry out quick project analysis in the process of optimization.

Conclusion

Application of the variable resource limitation approach using «Primavera» software makes it possible to reproduce the process of realization of real projects not only at the planning stage but also at the stage of project realization. Modeling project implementation with variable resource limitation enables students to develop skills of analyzing the project progress and quantitative estimation of the project, develop the ability to optimize project resources and acquire practical skills of using the changes management mechanism in the project.

Implementation of «Primavera» software in the process of project managers training enables to model situations that provide approbation of theoretical knowledge acquired during the course of study.

The competence in project activity planning with variable resource limitation enables to apply the project management methodology under in the conditions of constant changes, adaptation and optimization in innovative projects.

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L.V. Baranovska, PHD, T.O. Kovalkova, (National Aviation University, Ukraine)

PROFESSIONALISM OF A PSYCHOLOGIST AS AN IMPORTANT CONDITION OF SAFETY OF PROFESSIONAL ACTIVITY OF WORKERS OF AVIATION INDUSTRY

In the article is grounded the role of human factor as an important for creation of safe terms for activity in air space, features of psychologist's work in aviation industry are analyzed.

Raising of problem. From the first days of development of aviation was formed the awareness of importance of the role of a man who undertakes a management of an aircraft. An error in an aviation results in human victims and considerable financial charges.That's why is exactly grounded the necessity of introduction of the most modern scientific achievements in particular informative which are directed on the increase of management efficiency in the difficult systems. At the same time being in the contour of management of a man as a cybernetic link of optimization of management process often reduces reliability and safety of the system and belongs to the so-called problem of human factor [1, p. 328]. Importance of human factor is fixed in the normative documents of ICAO which it becomes firmly established in that one of tasks of account of human factor during providing of safety of civil aviation consists in creation of the system of aviation safety which is a bar to the consequences of errors of a man [7]. For the last decades were got substantial results from point of safety and benefit in the field of civil aviation and other industries of human activity due to investments in human factor. Coming from small probability of that a man-operator (LO) will disappear from the future systems of aviation safety, is needed a system approach to the aspects of human factor in this sphere. The analysis of reasons of origin of technogenic failures and catastrophes shows that a human factor plays a decision role in many cases. From data of national security service 70% aviation catastrophes on the transport of the USA are identified as an error of a pilot. Consequently, its safety depends on especially psychological, personality, actually professional qualities of workers of aviation industry.

Purpose of this article is determination of the role of psychologist's professionalism as a term of safety of professional activity of workers of aviation industry.

Experts mark that «Ukraine continues to keep after itself the status of the state, scientific and technical, technological and skilled potential of which allows to create competitive aviation products and to be among those countries of the world which are able to provide progress in one of major and the most difficult industries of world economy» [2].

Grounding specific of professional activity in aviation industry expedient is an address to interpretation of essence of concept «aviation». In the Air code of Ukraine marked that «aviation as an industry is all types of enterprises, organizations and establishments activity of which is directed on conditioning and use of air space of a man by air ships» [5]. Consequently, a concept «aviation» engulfs the phenomenon row of contiguous concepts, basic among which are concepts «aviation industry» and «aviation transport system».

The negligible quantity of research workers studied the features of functioning of this industry. S. Isaenko, L. Molotay, I. Khomyuk probed qualities that are necessary for a modern engineer and also the basic requirements of profesiogram and requirements of international organizations from a civil aviation to the profession of engineer of aviation industry. N.A. Orlenko interested professionally applied physical preparation of future pilots in higher educational establishments. L.M. Konoplyanik studied readiness of future engineers of aviation industry to the use of foreign language in professional activity, I. Kolodiy was interested in the problems of preparation of translators of aviation sphere, Y.V. Absalyamova studied professional adaptation of young teachers of foreign language for work in more high aviation technical educational establishments. The objects of their scientific interest were pilots of civil aviation, engineers from service, engineers from avionics, controllers from air traffic control. O.V. Petrenko probed psychology of activity of flightcrews, psychological aspects of management safety in the field of

aviation. The special researches devoted to professional preparation of future psychologists of aviation industry are however absent.

Exposition of basic material. Expedience of actualization of exactly this component of the special studies is predetermined by the specific of profession of a psychologist. The object of his activity is personality of another man that in same queue predetermines the high level of requirements in relation to his professionally personality qualities. The most important requirements that pull out to personality of practical psychologist, are confidence in himself and in the necessity of his work. Next to it a psychologist must be oriented on the people which he works with; it is necessary for him to care of the exterior, be pleasant in socializing with others. Such qualities as strong, mobile type of the nervous system and high capacity will be instrumental in the increase of level of professional fitness of future psychologist. Basic contra-indications in relation to the choice of this speciality are at first presence of rough defects of exterior, secondly complexes (personal qualities) of a man which draw it permanent actions, oriented to self-affirmation due to professional activity.

Appearance of the first psychologists which work in the system of civil aviation was conditioned with the queries of practice. At first there was a requirement in psychological education of air stewards (stewards), later was defined the special system of teaching for air stewards. Weeds broadened activity of psychologists, engulfing greater amount of specialists. Today work the representatives of different professions in the field of civil aviation: pilots, members of flightcrew, air stewards, engineers-technicians of airplane, air traffic controllers, ticket cashiers and many others. All these specialists are the object of labour of practical psychologist.

Activity of a psychologist in the system of civil aviation in particular psychological analysis of human capitals consists foremost in the leadthrough of psychological conversation with candidates on position of air steward, pilot, controller from maintenance of air space, engineer from repairing and maintenance of air space. A psychologist must define psychological readiness of a candidate for work in the system of management of an air ship, maintenance of air passengers and also in the extreme terms of risk for life. Conversations are conducted with those who wish to work in industry and also with those who already works in it.

Other important direction of activity of practical psychologist-worker consists in consultative work. The most widespread themes of consultations are production conflicts (in particular with guidance), home attitudes and also problem of professional adaptation of employees of aviation industry toward a new profession, to the new terms of labour. Problems even personality character negatively influence on quality of labour of employees. That is why the important task of psychologist consists in helpness to settle difficult vital situations.

The ultimate goal of activity of psychologists consists in heaving up on a higher level the labour of both employees and leaders of airlines productivity. For this reason their near-term professional tasks are: making of criteria of professional fitness of different categories of workers onboard airplane, study of workers of service the psychology of interpersonality intercourse, research of mutual relations in the group of employees and their influence on quality of maintenance of passengers (service).

Taking into account the features of professional activity of psychologist seems especially valuable his role as an important human factor for creation of safe terms for activity in air space. In fact flying activity has the specific signs. Among them are unusual for a man terms of tearing away from earth, rapid moving in space, forcedly high rate of activity, brightly expressed emotional background of work, necessity of simultaneous implementation of different actions on the separate stages, possibility of sudden origin of near-accident, influence on the organism of physical factors (acceleration, vibrations and others like that) which substantially influence on motion of psychical processes [6, p. 38].

Flying activity is one of the most difficult and the most dynamic. K.K. Platonov marks on this occasion that "flying composition of modern air ship works on verge of human possibilities" [4, p. 72]. So, for example, at implementation of landing a pilot carries out 20 motions in a minute by hands, simultaneously looks after devices, taking of air ship determines and corrects it by helms,

conducts radioobmin, constantly analyses information and executes operations in accordance with its maintenance and air situation.

Let's outline expedience of psychological support of professional activity in the field of aviation on the example of analysis of features of professional activity of pilots. Professional activity of a pilot is the difficult system of intellectual actions. Most role in it played such mental processes as supervision, control, estimation of situation. For a pilot is characteristic activity in the conditions of deficit of time and strong emotional tension. He must constantly keep high vigilance, ability to join in a decision of unexpectedly difficult tasks. A pilot absolutely need sharp sight and ear, well developed measurement with naked eye, irreproachable health, firmness of vestibular vehicle, ability to rapid switching of attention, firmness to the monotonous actions, high emotionally volitional firmness, maximally rapid reaction both on simple and on difficult stimuli. He together with a co-pilot manage motion of air ship during all flight. They are responsible for its progress and arrival in an eventual point exactly on schedule.

A few stages have flight of air ship. They are flight, set of height, horizontal flight after a route, decline and landing. On all stages flight takes place under the direction of controller from air traffic control, with which a crew supports radio connection during all flight. Nowadays is a great number of devices which help a pilot to conduct an airplane from an autopilot, independently supports the course set of an airplane to the radio-locator that allows an airplane to sit down in the conditions of complete optical invisibility of earth. A pilot manages all these devices which are within the limits of availability in his booth. In the same time he analyses information which acts from devices, presents in details the state and work of the systems and aggregates, position of airplane in space, mentally foreseeing the conduct of his systems and aggregates. Activity of a pilot takes place in the conditions of permanent tension and readiness to the immediate reaction on arising up supernumerary situations. For the sense of danger of the pilots of civil aviation added fear of responsibility for dozens of passengers that negatively influences on emotional firmness of pilots.

Danger which can happen in air space requires from a man the rapid switching of psychical activity on a background of emotional tension which arose up [3, p. 242].

Labour in extreme terms in which most specialists of aviation industry work results in that they experience the crisis states which show up in the professional burning out, falling under stresses and also to impossibility of adaptation to the new terms of labour. [8, p. 354]. Such specific of professional activity in aviation industry requires the high level of professionalism of practical psychologist. Under it we understand integral psychological description of man of labour who represents a level and character of capture a profession.

Work of professional psychologist in the certain spheres of human activity has the features which are predetermined by the specific of its object, terms of realization of its tasks. Such specific is peculiar also to professional activity of psychologist in aviation industry. The objects of his professional attention are pilots of air ships, controllers from maintenance of air motion, engineers from maintenance of aeronavigation equipment and others. They are responsible for safety in air space the stay in which sometimes is correlated with the states of enhanceable extreme. Work in extreme terms foresees the enhanceable factor of risk, necessity of acceptance of adequate decision, high responsibility for the job processing, presence of unexpected obstacles. Usual office and rest hours are often enough violated in the extreme terms of work. It all pulls out enhanceable requirements to the state of psychical health of personality. The strong emotional and physical loadings create pre-conditions for an origin of psychical, somatic disorders and also in some cases suicide behavior. At such extreme terms of professional activity important is firmness to stress of such personalities because of potential danger of the emotional burning out. Consequently, the important task of a psychologist in the field of aviation activity is a grant of skilled consultative help to a personnel, assistance of professional adaptation, leadthrough of psychological education of civil aviation workers and prophylactic work from warning of the emotional burning out of workers of industry. And for implementation of these tasks is needed the special preparation in the conditions of studying in the university. The important mean of study with an orientation on skilled

professional activity in this industry is a cycle of disciplines «After the independent choice of university». In particular at preparation of psychologists of aviation industry especially meaningful are such educational courses: «Psychological problems of intercourse in professional commands and crews», «Psychology of aviation sport», «Psychological technologies of work with a personnel», «Psychology of professional risk», «Psychology of extreme and crisis situations», «Poststress rehabilitation».

Conclusion

The role of a psychologist as a human factor in aviation is considerable, however there are such problems:

- not always high-quality is a selection of university entrants on this speciality as graduating students from school often do not know the object of future activity and specific of industries of their possible employment;
- low level of motivation in relation to employment exactly in aviation industry of graduating students from school after speciality «Psychology» through the insufficient level of the personal interest of leaders of industry in the workers of this qualification;
- not always future psychologists are psychologically ready for professional activity in aviation industry (they do not have formed setting on the proper activity).

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CONGRESS SECRETARIAT
National Aviation University,
1, Kosmonavta Komarova ave.,
Kyiv, 03680, Ukraine
Tel: +38044 406-71-56
Fax: +38044 406-72-12
e-mail: aviacon@nau.edu.ua
Congress homepage: