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### **Professional competence of air traffic controller in the sphere of subject-activity approach**

#### **Urgency**

The increase of civil aviation role in international public conveyance and freight, the growth of air traffic intensity at international airlines and the rapid progress of aeronautical engineering are require to pay a special attention to the aspects of civil aviation safety assurance. Not only environment and technical means play great role in the sphere of flights safety. During the process of flights support and provision a man (in our case it is an air traffic control officer – further – ATCO) takes part in the most responsible process of his professional activity – information analysis and decision making. For example, the reasons of 75% of aviation accidents are operators' mistakes.

In common the controllers' staff is a part of so called „human factor”, which influences on flights safety directly, making it better or worse. According to the last variant, the reason is insufficient professional training, leading to the problems with ATCO professional competence.

The pedagogical science defines the term „professional competence” as „...the totality of knowledge and skills, defining the effectiveness of work; the volume of skills, relating to task performance; the combination of personal qualities and characteristics; the complex of knowledge and personal characteristics, which are important from professional point of view; vector of professionalization; the unity of theoretical and practical readiness for a work; the ability to realize the complex cultural relative types of actions etc.” [Введенский 2003: 51]. Taking all this into account we get two components of professional competence – subject and activity, which he performs.

The necessity of ATCO professional competence review in the aspect of these two components is caused by following factors:

1. The formation of a man as a professional is closely connected to his development as a personality.
2. The development of professional's personality supposes the proper dynamics of its properties and qualities, presented as an 'increase' of personality.

3. The fundamental condition of personality's professional growth is a transition to higher level of professional self-consciousness.
4. The process of contradictions solving works as a driving force of personality's professional growth.
5. Professionalism is a result and criterion of professional development.

### **1. The analysis of last researches, relating to the problem, described in the article**

The professional pedagogics and psychology includes many researches, relating to the aspects of professional competence and subject-activity approach. The aspects of professional competence are described in the works of I.A. Zyazyun, V.O. Slastyonin, N.V. Kuzmina, A.K. Markova, N.P. Grishyna, V.V. Kosarev, N.M. Lobanova, M.I. Lukyanova, G.S. Danilova, G.V. Bilenka, V.M. Monakhov, O.I. Nizhnikova, V.V. Yagupov and other scientists. The subject-activity approach was created, beginning from 20<sup>th</sup> years of last century, by such scientists as S.L. Rubinshtein, O.M. Leontyev, P.Ya. Galperin, N.F. Talyzina etc. Nowadays its development is in process because of the necessity of aviation specialists' professional training methodological systems creation on the base of state standards of higher education.

The analysis of these and other researches showed that implementation of term „professional competence”, its content and structure into the sphere of aviation controllers' professional training is one-sided enough (for example, its definition, given by Eurocontrol organization is not accurate and have a common character, the process of professional training takes into account only some of its components etc.) with the necessity of overcoming of different methodological, theoretical and practical difficulties, specifies by, for example, some local peculiarities and other factors. Due to different understandings of ATCO professional competence content and isolation of activity component from subject one in the process of professional training (especially in its simulation training part) of specialists, mentioned above, we concretize the aviation controllers professional competence in all its characteristics in the sphere of subject-activity approach in this article.

### **2. The description of main research material**

It's necessary to mention that aviation controller's professional competence forming and development lasts during all his professional life – he has to pass continuous training, because his decision defines flights safety, people lives and aircrafts state. So the problem of forming and maintenance of subject's state as an aviation specialist (aviation controller) and his activity as professional enough for air traffic control is being solved continuously in such a way.

ATCOs professional training and their professional competence forming and development include four main stages: 1) Initial training; 2) Unit Training; 3) Continuous training; 4) Development Training.

We have to pay attention to the fact that all the process of professional training is based on different approaches to specialists training, one of which is subject-activity approach. The plot of this approach to professional training is a category „subject of training”, which is the result of integral vision of a man in the unity of his natural, professional, social and spiritual sources.

S.L. Rubinshtein, O.M. Leontyev and other scientists created the system of man’s activity in the sphere of subject-activity approach, which includes two sub-systems – psychological (internal) and organizational (external). The works of L.B. Itelson and V.D. Shadrikov define the following composition of the learner’s training – cognitive activity psychological sub-system: motives, goals, program, information basis, decision-making block, results. In its turn the organizational sub-system of training – cognitive activity includes the following elements: subject, process, object, means, conditions, product (V.A. Kozakov).

According to definition of Eurocontrol organization, ATCO professional competence – is his ability to use the professional knowledge, skills and experience to provide air traffic control services, which are described in his license. We suggest that this definition is not full enough and it needs special addition: „**ATCO professional competence** – is a complex of his professional knowledge, skills, habits, personal characteristics and abilities, which are important from professional point of view, that he always able and ready to use professionally and specially and utilize effectively in order to realize his own duty competences during air traffic control, as described in his license” [Свистун 2006: 164].

Professional competence has the following structure: *value-motivation component* (special interests, needs, motives, values and special attitude); *emotional-willed component* (understanding of personal emotional states; the constructive demonstration of emotions; avoidance and removal of negative emotions; firmness to negative influence of professional activity emotion factors; the ability to mobilize the physical, intellectual and moral powers; the ability of responsible decisions making etc.); *cognitive component* (the knowledge and ability to gain and develop knowledge; to identify and analyze factors, which influence on working process); *operational – activity or praxeological* (special experience; special skills; special habits; special thinking; special behavior; the usage of standard technological procedures); *foreign language communicative competence* (the totality of knowledge, skills and habits, allowing to realize communicative process in foreign language effectively depending on professional needs; the mastering of four kinds of language activity: audition, speech, reading and writing as a mean of communication and professional activity performing as a subject of aviation activity; the ability and readiness of ATCO to speak aviation English and radiotelephony effectively, taking into account the knowledge of norms, rules and formulae of etiquette, national culture realia and culture-oriented linguistics facts of other aircraft operators or controllers etc.); *the characteristics, which are important from professional point of view* (technical abilities; logical thinking and analytical skills; the skills of effective decision making in the lack of time conditions; the skills of fast and correct decision making in difficult

situations; scrupulousness in work; resourcefulness; the ability to find appropriatenesses; short-term memory; concentration, attention switch and distribution; curiosity; the ability to work as ATCO; firmness to stress; communicability; responsibility; the wish to help; the ability to think in non-standard way and non-standard decision-making; the ability to find something new and realize it in practice etc.); *control-valuation competence* (the control for and evaluation of psychophysiological state of personal and others, and specialists' psychophysiological readiness for controller work; the control for and evaluation of air traffic state, different standard and non-standard situations (their state and changes) in the professional activity; the process of control for and evaluation of performance and results of his professional activity by ATCO according to his qualification mark; controllers' shift team work; self-control for and self-evaluation of performance and results of his professional activity by ATCO according to his qualification mark; the acquisition of the results of professional knowledge, skills and habits forming (examinations, testing, simulation, on-the-job training etc.); the comparison of the results of professional knowledge, skills and habits forming and the peculiarities of professional activity, relating to air traffic control, performance etc.); *subject (integral) component* (professional sense and self-awareness; reflexiveness; professional „Self-conception“; subjectivity in professional activity).

It is necessary to mention that according to subject-activity approach ATCO professional competence is an original combination of category „subject“ and one of sub-systems of activity category – psychological (internal) (watch Table. 1).

**Table 1**

**The relation between the components of subject-activity approach and the elements of ATCO professional competence**

The components of subject-activity approach	The elements of ATCO professional competence
1. Category „subject“	Includes all the elements of ATCO professional competence, the forming and development of which are individual and unique for every person.
2. Activity category	
Psychological (internal) sub-system	Includes value-motivation competence.
a) motives	It cover*: – cognitive – gnostical competence; – operational – activity (praxeological) competence; – foreign language communicative competence. * In this case we refer to existing level of these competences forming, their level, which ATCO try to reach, and the way he wishes to do it.
b) goals	

в) program of activity	<p><b>It covers:</b></p> <ul style="list-style-type: none"> <li>– cognitive – gnostical competence from the point of view of the ability to gain and improve knowledge; to define and analyze factors, making influence on working process;</li> <li>– operational – activity (praxeological) competence from the point of view of standard technological procedures usage.</li> </ul>
г) information basis of activity	<p><b>It covers:</b></p> <ul style="list-style-type: none"> <li>– cognitive – gnostical competence;</li> <li>– operational – activity (praxeological) competence;</li> <li>– foreign language communicative competence.</li> </ul>
д) decision-making block	<p><b>It covers:</b></p> <ul style="list-style-type: none"> <li>– emotional – willed competence.</li> </ul>
е) results	<p><b>Cover*:</b></p> <ul style="list-style-type: none"> <li>– cognitive – gnostical competence (the totality of knowledge, necessary for control, and the ability of their gain and improvement);</li> <li>– operational – activity (praxeological) competence;</li> <li>– foreign language communicative competence;</li> <li>– the characteristics, which are important from professional point of view.</li> </ul> <p>* In this case we refer to the result of goals achievement by future or active ATCO, more over this component of subject-activity approach can cover as control-evaluation, subject competences, as all other elements of ATCO professional competence.</p>

It should be noted that, from the **organizational (external) sub-system's** point of view, the air traffic management system itself has the following components: subjects (the crew and ATCO – at their working places); the process of air traffic control or aircraft handling procedures; object (rules, documentation, staff qualification level etc.); means (aircraft, aeronautical equipment – on board and on land); environment (the exploitation conditions, in which the all mentioned above system components should function); product – air traffic safety.

Within the frameworks of this system the ATCO professional competence operates as in the process of professional training (using high-fidelity controller simulators), as in the process of 'live' air traffic control.

### Conclusions

The subject-activity approach pays a substantial attention to the practical aspect of aviation controllers' professional training. ATCOs professional training refers to subject-activity approach in two areas: subject-professional and activity.

## Literature

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## Abstract

The forming and development of air traffic controller’s professional competence according to the subject-activity approach is described in this article. The main components of subject-action approach are described too.

**Key words:** air traffic control, air traffic controller, professional competence, subject-activity approach, types of professional training.