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PROBLEMS OF THE EDUCATION AND TRAINING OF COMBAT CONTROL OFFICERS

The article looks into the problems of the professional training of combat control officers, gives rational as to why these problems are thought to be important and determines the ways to deal with them. The authors analyze the professional activities and the situation with the professional training of aviation combat control officers, specify the areas where the effectiveness of basic professional training can be made better and skills needed for controlling crews while performing combat tasks in various navigational and tactical situations -- refreshed and improved. A complex approach to the employment of simulator systems is defined as one of the possible ways to improve the training of combat control officers.

Keywords: operator, combat control officers, ACS, trainer, training, stage tweedehands operators.

Introduction

Statement of the problem. According to well-known Ukrainian scientists, the present state of education and training theory and practice is characterized by attempts at finding ways to react in a timely and anticipatory manner to the challenges of our time. The high dynamics of changes, globalization processes, unpredictable future, crises, intensive growth of high-technology production, communication, and human geographical and economic mobility – all these affect the quality of life in all countries [1]. The Armed Forces of Ukraine – especially the Air Force, their most technological branch – cannot stand aloof of these phenomena.

Being a powerful branch of the Armed Forces of Ukraine, the Air Force is capable of conducting a wide range of combat missions to ensure our Ukraine's national security, territorial integrity and sovereignty. Therefore, its development is aimed at the formation of highly professional, mobile and battleworthy force. Major efforts here are aimed at improving military skills and technical equipment [2].

At the present time, one has to admit that the social and economic changes of the last decade have led the Air Force to the point beyond which irreversible processes begin to appear.

The situation, in which the Air Force has found itself, leads to the following consequences [3]:

- a decrease in motivation for the job of piloting aircraft and the job of controlling aircraft (more than 30 % of the personnel);
- a persistent tendency towards a sharp decrease in the intensity of air operations, long breaks between the times when control of flights is exercised, and as a result – a significant loss of practical skills among pilots and aviation combat control officers;

- a deterioration of the operational reliability of aircraft and their maintenance due to technological obsolescence, lack of spare parts and inadequate training of ground personnel sets special demands for the emergency situation training of air traffic control officers;

- a significant decrease in the age of flying personnel, especially intermediate-level officers who lack practical experience in organizing flight operations;
- a deterioration of the results of applicants' psychological tests evaluating professional aptitude.

This situation makes the process of training both air crews and combat control officers more complicated. The training of combat control officers is directly proportional to the level of training of air crews, the serviceability of aircraft and equipment, fuel supply, etc. A decrease in the intensity of flights leads to a deterioration of the skills of air crews and controllers, which affects flight safety and effectiveness of combat operations. At the same time, the task to maintain the level of theoretical education and practical training of combat control officers remains.

Thus, to maintain an appropriate level of training of combat control officers, it is necessary to focus attention on simulator training, its methodological support, modern simulator systems (complexes), armament and materiel, which will allow to maintain and consolidate knowledge and obtain skills needed for controlling air crews in the complex and dynamic navigation circumstances and emergency situations.

Analysis of recent research and publications

The research of recent years [4, 5] has looked into the problems of air traffic controllers' training and the development of a system of evaluation criteria for an

automated analysis of air traffic controllers' actions on simulators.

The problems of upgrading training facilities and training equipment for the benefit of implementing the concept of training troops have been researched [6, 7].

Some works [8] have dealt with the problem of psychological support of combat control officer training in the "cadet – teaching and educational environment" system.

But the problem of improving the training of combat control officers, including the use of simulators and simulator complexes for forming skills in controlling aircraft in a complex dynamic navigation and tactical situation is not resolved. Besides that, the issues of forming professional competence in the course of practical training, the role of simulator training in the system of professional training of combat control officers have not been considered.

The goal of the article formulation

The task of this article is to determine the ways to increase the effectiveness of professional training of air command control officers.

The main material

The starting provision of this research is the data of the analysis of combat control officers' professional activity [8, 10].

Operator (combat control officer) makes complex and critical decisions with regard to controlling aircraft, the effectiveness of accomplishing the tasks assigned to aircraft and in some circumstances the safety of the aircraft and the life of people depending on his correct action and ability to find and implement the correct and timely decision [9].

As to the functions of combat control officers, let us note that they focus on controlling air crews from control posts in their areas of responsibility during combat missions in a complex dynamic environment. This work belongs to complex group activities and occurs in multifactor conditions [10]. Thus, the training of a combat control officer should be focused on the unity of effort with other members of the group. Working as a group, combat control officers gain the experience of performing the functional duties they will perform in the course of combat actions. Therefore, in the training process, it is necessary to use phases of group interaction (involving in the activities, coordinating, working in pairs, small groups, as a class) and such forms of interaction which are appropriate to the nature of professional activity (imitative action, self-regulating, self-organizing and self-motivating actions, equal partnership interaction in pairs, small groups, classes). The use of simulators or simulating systems in theoretical instruction and practical training, which

simulates control over an object by an operator represent such phases of group activities [10].

Due to increased requirements for the quality of training of combat control officers in conditions of a decrease in the intensity of operations, long breaks between times when control over aircraft is executed, simulators are the most effective means of training. Using them in class provides maximum effectiveness at minimum cost. Improving the effectiveness of simulators is a large complex problem, the solution of which depends on a number of factors [9]. However, there are two basic directions in this work. The first one is the improvement of equipment used in the training of operators and introducing it into the training process, the development of mathematical support and software for simulators and improvement of methodological guidelines for their use (Fig. 1). That said, it is necessary to unequivocally answer the following questions: What should combat control officers be taught? What kind of methodology should be used? What kind of training equipment should be used as simulators?

The answer to the first question can be obtained through analysing a real object which is simulated and the operator's actions in controlling it. It is necessary to determine the optimal (rational) algorithm of the operator who controls the object in various situations; to define the range of skills that are developed with the simulator; to make a list of emergency situations which must be trained; to determine the requirements as to the depth of automated skills that are to be formed, etc.

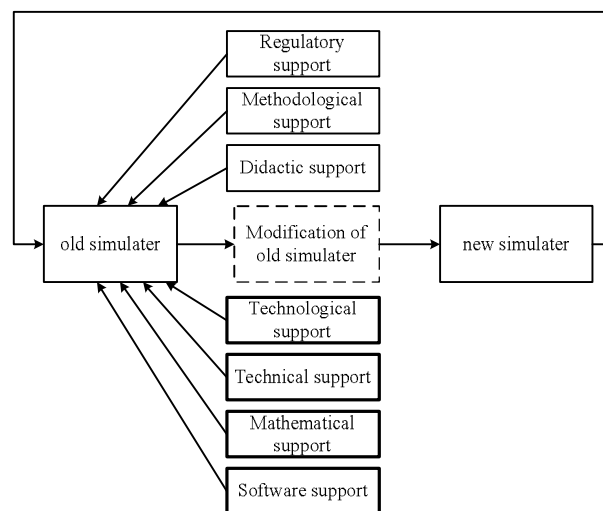


Fig. 1. Methodological foundations of the modification of simulator systems

The answer to the second question determines the directions of methodological training of instructors, development of teaching materials and control over the training process based on studying the characteristics of

the operator and his capabilities for controlling an object, namely:

- analyzing and improving techniques of conducting classes and training with simulators;
- developing and improving syllabi with consideration for the use of simulators;
- studying and establishing the rational for the use of documentation, instructional materials, and manuals which instructors require to operate a simulator successfully;
- improving methods for assessing the degree of practical training of operators in the course of their work with simulators;

– developing and improving means of objective monitoring of the operator's actions when using simulators in class -- including automated assessment, registration and documentation of the training process and its results for further use at the stage of analysis, recording and reproduction of a training session -- and implementing them into the process of education and training;

– implementing the results of scientific researches and pedagogical experiments that aim to create new and improve existing simulators, to increase their capabilities and effectiveness;

– perfecting the system of training, selection and qualification improvement of practical training instructors; which will significantly improve the quality of classes with the use of simulators.

The experience that we have in training combat control officers allows us to determine and formulate organizational problems of the system of training, namely:

- insufficient practical orientation of senior cadets' training as to the execution of control and guidance of aircraft onto air and ground targets;
- insufficient correspondence of the simulator resource base to today's requirements for training;
- the absence of centralized manufacturing of simulator complexes for the training of combat control officers leads to their development and manufacture by educational establishments on their own as part of their research work;
- the absence of unified simulator systems leads to the problem of the availability of centralized training of the instructors for the use of simulator systems.

Conclusions

Maintaining and refreshing professionally important qualities, using simulators is one of the main forms of combat control officers' training, allowing them to consolidate and deepen their knowledge, acquire skills in controlling crews in any navigational and tactical circumstances.

The level of professional skills and safety of flights will depend on how well thought-out the content of such training is, how well the training process is organized and conducted. These circumstances necessitate the unification of simulator training at all levels, from the educational establishment to the duty station of a specialist (Fig. 2).

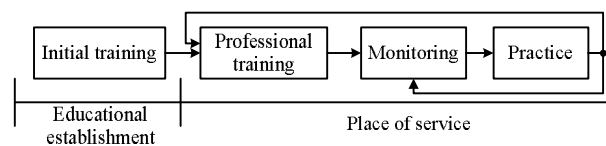


Fig. 2. The process of training combat control officers

A possible way to achieve of this aim is to improve the existing simulators and introduce new simulators into the training process, to perfect the methodological support of classes where these systems are used, to improve mathematical and software support for simulators. Using simulators and simulation systems allows to create a combat control officer environment that is realistic to a maximum extent, provided there are complex measures for the implementation of such systems.

Further researches should be directed towards creating and providing the rational for a unified methodology of building simulator complexes based on modern information technologies, new didactic and technical solutions.

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ПРОБЛЕМИ ПІДГОТОВКИ ОФІЦЕРІВ З БОЙОВОГО УПРАВЛІННЯ АВІАЦІЄЮ

В. Г. Чернов, О. І. Тимочко, М. А. Павленко, О. Ю. Дорош

У статті розглядаються проблеми професійної підготовки офіцерів бойового управління, обґрунтовується її актуальність та напрямки її реалізації. Аналізується професійна діяльність та стан професійної підготовки офіцерів бойового управління авіацією, визначаються напрямки підвищення ефективності базової професійної підготовки, вдосконалення та відновлення навичок в управлінні екіпажами при виконанні бойових завдань в різних умовах навігаційно-тактичної обстановки. За один з можливих шляхів підвищення професійної підготовки офіцерів бойового управління авіацією визначено комплексний підхід до застосування тренажних комплексів (систем).

Ключові слова: оператор, офіцер бойового управління, АСУ, тренажер, підготовка, тренування операторів.

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В статье рассматриваются проблемы профессиональной подготовки офицеров боевого управления, обосновывается ее актуальность и направления ее реализации. Анализируется профессиональная деятельность и состояние профессиональной подготовки офицеров боевого управления авиацией, определяются направления повышения эффективности базовой профессиональной подготовки, усовершенствование и восстановление навыков в управлении экипажами при выполнении боевых задач в разных условиях навигационно-тактической обстановки. За один из возможных путей повышения профессиональной подготовки офицеров боевого управления авиацией определен комплексный подход к применению тренажных комплексов (систем).

Ключевые слова: оператор, офицер боевого управления, АСУ, тренажер, подготовка, тренировка операторов.

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