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### **Aviation Infrastructure: Human Factor vs Automation**

*The state of the formation of modern aviation infrastructure is analyzed. The human-dimensional character of aviation development as a sphere of services is substantiated. On the basis of the analysis of some legal acts, the place of specialists of humanitarian, social and behavioral specialties in the structure of the aviation complex of the sphere of services was revealed.*

The first steps of humanity towards conquering the skies originated from brave dreams. The dreams joined with pragmatics which, for its part, allowed introduction of the corresponding scientific and technical tasks. Thousands of attempts to get off the ground, hundreds of fallen daredevils have made it obvious that aviation requires renovation of science, technical equipment, technologies, approaches, and principles. Little wonder that during the whole 20th century aviation and cosmonautics have been engaging the best scientists and engineers. However, achievements of aviation industry also determined a new range of issues which appeared to have no exclusively technical solution. Within the ICAO documentation, these issues are recognized as a “human factor.” We shall not dwell on this point much, but it is worth mentioning that the human factor denotes situations when the further series of events are caused by a decision made by a pilot, an air traffic controller, a flight attendant.

Desire to narrow human impact on the course of processes has led to incredible sophistication of aircraft technical equipment. Control and autopilot systems, heuristic algorithms, and similar modern automatic control facilities are able to prohibit or even ignore pilots’ actions if the artificial intelligent happens to find them extremely harmful. This opposition between technical equipment and human has moved aviation and cosmonautics beyond the area of scientific and technological issues. As a result, psychology, ergonomics, neurophysiology have become integral components of the complex of aviation sciences.

Today, we face the new stage of aviation development and observe its incorporation into commercial area as a service of massive and global character. Aviation is the point of contact, intersection of cultures, peoples, religions, world views, economies, ideologies, and in the Internet era it has become a real (unlike the virtual) channel of global communication. The mentioned makes us emphasize the human essence of modern aviation infrastructure and interpret it as a form of personality socialization.

The statements regarding importance of courses in the humanities and social-political sciences within the structure of modern aviation industry as a sphere of services are not exclusively notional, theoretical, but evolve from the range of

regulatory and service documents in aviation. As an example we chose the Air Code of Ukraine which does not only regulate legal grounds of activity in the sphere of aviation, but also determines infrastructure of the latter. Relying on the analysis of the certain mentioned provisions of the Code, we will try to represent aviation as an area where scientific-technological and social and humanitarian innovations find their realization.

The basis of analyzing aviation as a social phenomenon constitutes substantiation of the unity of material and spiritual aspects of human activity considering its creating, improving and using which correlates with general civilization trends of human progress. According to Article 10 of the Air Code of Ukraine, an authorized civil aviation body sets qualification requirements, provides approvals and cancels approvals of candidatures of aviation activity subject heads, managers of these subjects responsible for aviation safety, quality control system in conformance with aviation rules of Ukraine. Consequently, recruitment must be performed by a specialist who possesses skills of conducting job interviews, detecting psychological features of applicants, who knows techniques of testing their abilities and skills, who is good at analyzing procedures of the documents submitted. These competencies belong to psychologists. Involving them to the process of interviewing candidates for positions allows to obtain objective data considering their health, emotional state, inclinations to infusion and panic during accidents, ability to quick decision making.

According to paragraph 6 of Article 11 “Legal and Regulatory Framework,” a head of the authorized civil aviation body, under aviation rules of Ukraine, can discharge a subject of aviation activity from performing certain technical or procedural requirements of aviation rules of Ukraine in case it will be found necessary to the benefit of society and won’t threaten civil aviation safety. It certifies that dismissal of a subject of aviation activity from performing certain technical or procedural requirements of aviation rules causes a need for determining and diagnosing their general psychological state, individual features which may lead to the insufficient level of performing the assigned tasks. Moreover, it is obvious that recognizing a subject as temporarily incompetent and diagnosing their individual qualities result in a need for engaging a psychologist – and also a sociologist when the matter is of the climate in a certain working group or a team. Due to sociometric studies, a specialist of the sociological service provides information about compatibility of team members, and results of individual testing allow them to create a detailed social-psychological portrait of a separate employee. A failure to perform these procedures among aviation enterprise personnel may cause a range of dangerous consequences and imbalance.

The provisions of Article 47 state that aviation activity is accompanied by obligatory presence of the number of documents, e.g. a registration certificate, an airworthiness certificate or a permission to perform flights, and a full list of aircraft documents determined by aviation rules of Ukraine. Preparing, regularizing, and introducing a whole range of documents are integral elements of aviation activity necessary for every aircraft to leave the runway – same as passengers are not allowed to take their seats on-board without submitting the proper set of documents. Sufficient competencies to execute the function mentioned in the Code article

belong to records managers who deal with developing, preparing and regulating informational and documentational provision of flight safety.

Executing requirements of paragraph 1 of Article 52 presupposes engaging psychologists, who determine readiness and psychological health state of an employee or a candidate for a position, and also educators, who are to develop necessary patterns of creating corresponding competencies among training department attendees. Legislation states that every candidate for a position in aviation enterprises must obtain a certificate specifying their satisfactory state of memory, attention, emotional sphere, time perception. Personnel with a high level of language proficiency, good articulation, and pleasant voice pitch may help, for instance, their airlines to create necessary image which, for its part, produces a great impact on customers.

Paying attention to training ground maintenance personnel mentioned in paragraph 3 of Article 52, it is worth noting that the very training of personnel also requires engaging specialists of humanitarian and behavioral areas. Particularly, significant number of air accidents could have been avoided due to timely diagnostics of attention level with the help of the famous Munsterberg test.

According to paragraph 1 of Article 116 of the Code, search and rescue of aircraft, crews, passengers, and all people aboard continue if it is technically possible, till all living are transported to a safe place, or till there is a substantiated hope to rescue everybody who may be alive. From this we shall draw a conclusion that after the successful rescue all the people who had been aboard must receive rehabilitation, procedures aimed at psychological recovery. These tasks are to be performed by a specialist who possesses knowledge in the spheres of psychology, philology, social work, and has highly developed communicative skills.

### **Conclusion**

The aviation of the late 20th – early 20th centuries is a complex human-machine complex, which depends on the scientific, technical, technological and socio and cultural aspects of social development. The progress of aviation as a sphere of services directly depends on the degree of its ‘disaggregation’ by humanitarian and socio and political sciences. The analysis of the Air Code of Ukraine shows that the effective performance of modern aviation tasks and the timely response to civilization dangers is impossible without the cooperation of experts in the technical and non-technical profile, coordination of their efforts.

### **References**

1. Aurino, D. Human factors and aviation safety: what the industry has, what the industry needs // <https://doi.org/10.1080/001401300409134>.
2. Human Factors in Aviation. – Los Angeles: University of California, 2014. – 684 p.
3. Povitrianyi kodeks Ukrainy // <http://zakon3.rada.gov.ua/laws/show/3393-17>