

RISK ASSESSMENT OF THE ADVERSE EVENTS IN AIR TRANSPORTATION

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In the field of safety in transport distinguish risks related to flight safety and aviation security. Safety of flights is ensured through the reliability of aviation equipment and the qualification of the personnel who services and operates it, aviation security is a condition of protection from illegal interference in its activity. It is quite difficult to use the existing experience of risk management, accumulated in other spheres, as civil aviation has significant features. Various methods and schemes can be used to assess risks. The article discusses various options for predicting risks. Taking in consideration the growth of the volume of air transportation, a widespread renewal of the airplanes and a generational change of aviation specialist, necessity of solving the problems related to a safety on the air transportation appeared on the new level. After conducting deep researches of air transportation and the industry of aviation, the International Civilian Aviation Organization (ICAO) concluded that the most effective way to improve flight safety is an implementation of systematic approach in the managing of safety on the bases of the risks. Flight safety (FS) is a complex characteristic of air transport and aviation service that define an ability to fulfil a flight without a threat to the life or health of people. Maintaining the flight safety of the aircrafts is complicate task that is solved by common effort of producers of the civil aircraft and the individuals who operate this equipment. It is right to say that flight safety is achieved by reliability of the aircrafts and qualification of personal that maintain and operate it [1]. ICAO defines flight safety as “the state of aviation system in which the risks associated with aviation activities are reduced and controlled on acceptable level” [1]. Therefore, the main tasks of maintaining flight safety of the Air Company are development of the measures for analyse, evaluation and implementation of the procedures that reduce the risks to an acceptable level and there is an ability to control them. However, there are not enough references in ICAO documents to build effective system of flight safety on the level of Air Company. Under these circumstances each air company is looking to solve the problems by developing their own methodology and tools of implementation. The use of an existing experience from other domains is difficult because the civil aviation has its own following specifics:

- – Extremely complicated systems of air transport (SAT);
- – High level of uncertainty during the influence from external danger factors, either natural or artificial;
- – The specific and diverse role of human in civil aviation;
- – Global scope of civil aviation activities.

This implies a certain specificity in the use of the concept of risks in aviation safety issues.

In modern terminology exist many definitions of a risk. All of them have conclusion that a risk includes probability of damage and a range of that damage. In other terms, if there are highest probabilities of happening one or other event, and the more damaging consequences would occur, the higher level of risk exists.

Representation of the risk of air transportation process by the risk of socio-economic harm makes it possible simultaneously determine both the coincidence of adverse events and inevitability of the damage in the same units, also costs of prevention.

Information about the all causes of the damage, before the unfavourable conditions happen, gives possibility to adapt a single mechanism of its origin in the process of foundation and

development of event as a transition of special situation from less to more hazards. Interference of organizations and individuals who are involved in the minimization and prevention of unfavourable consequences are taking in consideration during this process.

Such approach would enable evaluate the parameters and predict a risk. The ability to predict a risk of socio-economic damage makes real the process of safety maintenance on the air transport. The aim of it is minimization of total cost of objective and subjective existence of hazards.

For evaluation of the risks, different methods and schemes can be used [2]. More often air companies use the Automated Systems (AS) for prediction and prevention of air incidents, where “Event Tree” and “Risk Factor Tree” are used to define the indicator of flight safety. Event Trees are the graphic models that streamline and display the process of unfavourable event. Such approach is legitimized by the standard ICO-9004-4 (1993) [3]. They also display how aircraft will react on initial event, will the safety functions be fulfilled during the process that is the condition of safety maintenance.

The conditional probability is displayed between the events at the nodes of the tree for the interconnection between them. The occurrence of each scenario’s development in the situation is calculated by multiplying the occurrence of main event by the conditional probability of the end event. The method is used to analyse possible reasons of happening specific situation during the flight and to calculate the frequency (probability of event’s occurrence) [3].

To describe the causations of “tree”, an information from the different sources are analysed:

- – Official reports about the investigation of aviation events;
- – Manuals, instructions and regulations of the air companies;
- – Technical manuals associated with construction and systems of the airplanes;
- – Analytical and statistical researches from different safety organization.

The use of “tree” allows evaluate probability of specific type of aviation event during the conditions and find a potential threat that can influence this event.

[1] ICAO. Annex 19 to the Convention on International Civil Aviation. Security Management flights, 2013.

[2] N. T. J. Bailey, The Elements of Stochastic Processes with Applications to the Natural Sciences. New York: John Wiley, 1964.

[3] EASA. SAFA Ramp Inspection’s Guidance Material v2.0, 2012. [Online] Available: <https://www.easa.europa.eu/sites/default/files/dfu/SAFA%20Ramp%20Inspections%20Guidance%20Material%20-%20Version%202.0.pdf>