

Research Anthology on Reliability and Safety in Aviation Systems, Spacecraft, and Air Transport



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Research Anthology on Reliability and Safety in Aviation Systems, Spacecraft, and Air Transport

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Chapter 19

Simulators as an Essential Tool for Shaping the Competence of the Aviation Personnel

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ABSTRACT

The implementation of the aviation tasks, including the preparatory ones, is a difficult, complex task requiring from the aviation personnel a high level of general, technical, and specialist knowledge and a wide range of skills, appropriate to the type of technical tools and systems being at the disposal of the aviation personnel as well as the complexity and difficulty of their tasks. Particular importance is currently attached to the development of training devices used in the basic training and in-service training of the aviation personnel. The authors have referred to the role of simulators in achieving the desired level of specialist competence by flight personnel, including, among others, such issues as aircraft simulators development, and their application in the aviation training; aircraft simulators classification in accordance with current aviation regulations; essential functions performed by aviation simulators; flight simulator is an essential tool for basic and in-service training of the aviation personnel.

INTRODUCTION

The results of the analyses conducted by the Author's of the material clearly point out to the fact that irrespective of the the type of aviation, the aircraft, and its nationality, or the time period taken into consideration, it is the human being – the pilot, mechanic, air traffic controller – that is the underlying factor of almost 70% of undesirable flight-related events (Kozuba, 2011). Z. Błuszczynski, when considering the relationship between the human factor and the undesirable flight-related events, highlights the inadequacy of the actions taken by operators – pilots and other aviation personnel who closely con-

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nected with flights, their organization and safety – to the situation that occurred in a certain phase of flight. Such an inadequate action usually leads to an undesirable flight-related event. That situation occurs when threats caused by factors independent from human control have not been removed, or reduced to an acceptable level, despite the real possibilities of doing so. Every action is a result of a particular decision and the related decision-making process. The factor which conditions the emergence of an undesirable flight-related event is usually the occurrence of several consecutive errors in the system of directing (management) an aviation organization, errors in handling the aircraft or in air traffic control, and / or operational errors committed by the air crew. The causes of erroneous decisions made by the pilot-operator are sought for at various stages of investigation whose aim is to discover them, taking into account particular complexity of the aviation system and its environment. Therefore, when discussing the causes of undesirable flight-related events, errors committed by the crew of the aircraft at various stages of the decision-making and implementation process are generally regarded as the key factor resulting in more or less serious consequences. Consequently, in the era when aviation technology is subject to dynamic development, great importance is attached to the quality of flight training, regardless of whether it is basic flight training or professional development training. Modern methods and tools used in the training process are expected to allow for the preparation of highly qualified aviation personnel having a high level of expertise and a broad range of skills which guarantee achieving the desired level of air mission execution at an acceptable level, from the perspective of aviation safety.

Taking into account the wide range of the topic, the authors referred to the main subject of work from the perspective of the pilot - operator of the aircraft. However, the reader should take into account the fact that the advantages and disadvantages of the simulator presented in the material refer both to the simulators used in the training of pilotes, as well as those used in relation to the residual aviation personnel.

BACKGROUND: DOES MODERN AVIATION NEED SIMUALTORS?

Tasks carry out by human in interaction with aviation technologies require the involvement of its basic senses in order to obtain data¹ and information. The relationship between data and information was interestingly presented by Daft, who says that “Information is what changes and supports understanding, while data is the input of a communication channel. The data is tangible and consists of numbers, words, phone calls or computer printouts sent or received. Data will not become information unless people use it to improve their understanding (Daft, 1992). Thus, the pilot to carry out his tasks in a particularly complex and dynamically changing task environment needs information in the sense of a “product of significant data processing” (Clare, 1987). On the other hand, the necessary condition for the process of “significant data processing” is the level of competence (knowledge and skills) and experience presented by the pilot-operator (Figure 1).

Figure 1. The process of data processing into information

Source: Own study



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