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Countering Air Terrorism

Springer

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Preface

The reason for the appearance of this book was the lack of currently relevant fundamental mechanisms for countering terrorism in aviation, as well as the growth of terrorist threats associated with the unstable world political situation. The use of aviation infrastructure facilities—airports and aircraft by terrorist organizations as targets of their illegal actions forces the world community to take more seriously the issue of ensuring anti-terrorist security in air transport, which determines the relevance of the book. At the same time, it is obvious that the possibility of committing terrorist acts is a consequence of serious shortcomings in the organization of anti-terrorist security in an aviation enterprise and, in particular, during inspection procedures that allow terrorists to freely carry prohibited items and substances both into the airport territory and directly on board the aircraft. The issue of anti-terrorist security becomes «No. 1» in the organization of the functioning of each aviation enterprise.

The main purpose of this book is to demonstrate the mathematical and mathematical-psychological models and methods developed by the author to reduce the risk of terrorist threats in an aviation enterprise by improving the organization of production processes and optimizing the distribution of financial resources when implementing systemic measures in relation to individual organizational measures of the anti-terrorist security system of an aviation enterprise, which determines the area of issues considered in it.

The book examines the issues of ensuring the anti-terrorist security of an aviation enterprise, provides an excursion into the history of terrorism in the aviation sector, and analyzes the legal regulation. The author provides a demonstration of the new approaches developed by him—mathematical and mathematical-psychological models and methods of reducing the risk of terrorist threats, which makes it possible to objectively increase the safety of air transport facilities, reduce the likelihood of terrorist attacks, save human lives and prevent significant material losses. The solutions of general humanistic problems proposed by the author of the book—preventing accidents and preserving the world—are an original feature of the book, which allows one to treat it with the necessary attention and interest for the reader. The concept of anti-terrorist security of an aviation enterprise, developed by the author of the

book, has been widely tested and introduced into the activities of leading aviation enterprises, including the Interstate Aviation Committee (IAC), and is used in the investigation of aviation accidents.

The book is written in an understandable scientific language, contains a sufficient amount of explanatory material and formulas, will undoubtedly be useful both for a wide range of persons associated with ensuring aviation transport security and for the end users of airlines—passengers, in order to expand knowledge about the reliability of using air transport.

Moscow, Russia Pavel Pavlovich Hachikyan

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Very special words of gratitude apply to my wife Joanna and daughter Emma, who always understood the fact, that I am often busy with scientific work.

Words of gratitude should be said to the team of Springer publishing house, which allows scientists around the world to disseminate and make available to everyone the most important scientific knowledge.

This work is an output of a research project «Study of models and methods of decision making under conditions of deep uncertainty» implemented as part of the Basic Research Program at the National Research University Higher School of Economics (HSE University).

With best wishes to the readers,
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Introduction

Relevance

The big resonance in the world is caused by tragic events on September 11, 2001 in the USA. Acts of terrorism, perfect members of the Al-Qaeda terrorist organization * by means of hijacking of aircrafts, claimed the lives not only of passengers but also the people in World Trade Center and the building of the Pentagon—all 2977 people died, 24 more persons remained in lists of missing persons. Events formed on September 11 a basis for revision of the security systems existing at that time and counteraction to terrorism of all objects of aviation infrastructure in the world, demonstrated their former low efficiency.

On August 24, 2004 at an interval of one minute, in air, the airliners Tu-134A-3 and Tu-154B-2 making flight from the Moscow Domodedovo Airport to Volgograd and Sochi blew up. The terrorist attacks conducted by suicide bombers claimed the lives of 89 passengers and crew members of airliners. The lack of necessary control of the organization of customs procedures of passengers and baggage from responsible persons of the airport gave an opportunity to terrorists to bring on board improvised explosive devices. Responsibility for the event is undertaken by the Karachay Jamia terrorist organization *.

On January 24, 2011, act of terrorism happened in the hall of the international arrivals of the Moscow Domodedovo Airport. The explosion made by the suicide bomber claimed the lives of 37 people, 172 wounded. Responsibility for actions is undertaken by the Islamic terrorist organization *Caucasus Emirate* *.

On October 31, 2015, there was the largest plane crash, which became the most mass death of citizens of Russia for all history of world aircraft—explosion of the passenger Airbus airliner of 321 Russian airlines *Kogalymavia* in air over the central part of the Sinai Peninsula. Drawdown of the improvised explosive device, which was mounted in a compartment of oversized baggage in a tail part of the liner served as a cause of the crash. Act of terrorism claimed the lives of 224 people. As a result of investigation, it was established that a terrorist attack is conducted by members of the Vilayat-Sinai terrorist group *, being ISIL branch * on the Sinai Peninsula.

Considering high costs of implementation of measures of ensuring acceptable level of safety, the scientific problem of decrease in risk of realization of terrorist threats in airline by improvement of the organization of productions and optimization of distribution of a financial resource at realization of system measures in relation to separate organizational measures of system of anti-terrorist safety of the air enterprise is staticized.

The solution of this scientific task in relation to separate organizational measures of system of anti-terrorist safety of airline is the purpose of the real research, as defined relevance.

The goal of a research achieved by a solution the author of the main scientific objectives

- Distributions of a limited financial resource between elements of highly reliable system of ensuring anti-terrorist safety by criterion of ensuring the maximum probability of protection against terrorist threats.
- Distributions of the set reliability between elements of highly reliable system of ensuring anti-terrorist safety by criterion of use of the minimum financial resource.
- Estimates of probability of realization of act of terrorism depending on quantity and reliability of boundaries of protection.
- Modeling of «system of ensuring anti-terrorist safety of airline».
- Developments of a method of selection of the experts involved in ensuring anti-terrorist safety of airline in qualification qualities.
- Developments of methodical recommendations about selection of the experts involved in ensuring anti-terrorist safety of airline in personal qualities.

In the Book, the Models and Methods Developed by the Author are in Detail Described

- Models of distribution of the set reliability between elements of highly reliable system of ensuring anti-terrorist safety by criterion of use of the minimum financial resource.
- Models of distribution of a limited financial resource between elements of highly reliable system of ensuring anti-terrorist safety by criterion of ensuring the maximum probability of protection.
- Model of assessment of probability of realization of act of terrorism depending on quantity and reliability of boundaries of protection.
- Model of «system of ensuring anti-terrorist safety of airline»
- A method of selection of the experts involved in ensuring anti-terrorist safety of airline in qualification qualities.
- Methodical recommendations about selection of the experts involved in ensuring anti-terrorist safety of airline in personal qualities.

The Scope of Scientific Research

The zone of responsibility of airline connected with ensuring protection against terrorist threats enters the borders of a research. A framework of a research is limited to development of the new scientific methods and models directed to decrease in risk of realization of terrorist threats in airline. As a basis of prevention of possible threat, the technical, organizational, and personnel-administrative measures (application of new methods, models) that beforehand carried out by airline directed to the prevention of terrorist threat are considered.

Theoretical and Practical Importance

The theoretical importance of a research consists of development of application of a mathematical apparatus at the solution of tasks of development of methods of staffing and modeling of distribution of a resource in relation to the solution of tasks in the scientific fields of ensuring aviation safety, the organization of production and operation of air transport.

The practical importance of a research consists of decrease in risk of realization of terrorist threats in airline that will objectively allow preventing possible consequences of terrorist attacks in the form of the human victims and material losses.

Methodology and Methods of a Research

The methodological basis of a research made: general scientific method of knowledge, legal and historical and legal methods, system and structural approach and system analysis, comparative, theoretical methods and idealization method. For the solution of the tasks of distribution of resources set in a research the mathematical apparatus and mathematical modeling (deterministic and statistical models), Neumann-Pearson's criterion and the Monte Carlo method used. Development of a qualification method of selection of shots is carried out with application of mathematical statistics and modeling. When developing methodical recommendations about a personal method of selection of shots the logic algebra, Boolean algebra, V. A. Lefebvre's, SMIL (MMPI) statistical scientific base theories are used. For check of adequacy of the developed methodical recommendations of selection of shots about personal qualities, used empirical and comparative methods of researches.

Use and Introduction of Results of Work

Results of research work of the author successfully used and introduced in activity:

- The Interstate Aviation Committee (IAC)—at investigation of the aviation incidents, for assessment of efficiency undertaken by airline of measures for ensuring anti-terrorist safety and compliance of level of training of personnel of service of aviation safety of airline to the tasks assigned to them;
- LLC GOSOBORONZAKAZ (Russian Federation)—when developing the concept of airline of civil aviation of the increased anti-terrorist security;
- The Russian academy of national economy and public service (RANEPA) under the President of the Russian Federation (Russian Federation)—when carrying out educational process in «Economic security», when studying by students of disciplines: national security, management of the organization (enterprise), control and audit, law enforcement agencies, psychology.

When carrying out a research author's inventions and useful models on devices to increase in reliability of a security system applied: the guard cabin, patent for the invention of RU 2586992 C1; the observation and watchtower, the patent for the useful RU 163226 U1 model.

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