SAFETY MANAGEMENT SYSTEM IMPLEMENTATION AT THE CIVILIAN AIRPORTS IN SLOVAK REPUBLIC

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The article "Safety Management System Implementation at the civilian airports in the Slovak Republic" is focused on safety, its observance, risks of accidents that may result in non-compliance with safety and the effect of human factors in aviation.
Keywords: Risk, accident, safety management, operational safety

1 INTRODUCTION

Aviation industry is remarkable thanks to huge technological leap that it made in the last century. Unfortunately, with the development of aviation the likelihood of hazardous air events also increases and in the worst case this can lead to accidents. Due to this, the compliance with security rules is now one of the main conditions for further development of aviation. The tool, which should ensure safety in the aviation sector, is called Safety Management System.

The aim of this thesis is to show safety, its observance, the risks of accidents which may arise due to non-compliance with safety rules, and the impact of human factors in aviation.

2 PEOPLE AND SAFETY

Human errors cause more than 70% aircraft accidents. In an environment with such an advanced technology as is typical for aviation, errors occur frequently because of an employee manipulating with the technology.

It is usually not too difficult to find the employee who caused the error when the accident is investigated, but it is much more difficult to investigate the reason for his failure. Therefore, finding the "source" of human error initiates the identification of poorly configured operating and safety procedures and also leads to detection of hazardous effects influencing human performance in the particular workplace.

Often the relationship between work environment, people and technology is expressed as so-called "Shell Model".

Shell Model= Software (procedures, processes, training, etc.), Hardware (machinery and equipment), Environment (operational environment), Liveware (people in the work environment).

3 LEGISLATION

Security in civil aviation is the essential principle of the civil aviation in the Slovak Republic. Slovakia has promised to introduce, implement, maintain and constantly update the tactics and procedures with the help of the Civil Aviation Safety Policy of the Slovak Republic, which must be applied and observed by all individuals in the civil aviation of the Slovak Republic. AIC 16/09 requirements for security management system Organizational structure, policies, procedures, responsibilities and approach to managing safety are a safety management system.

3.1 The national aviation security program

The main fundament of the National Civil Aviation Security Programme of the Slovak Republic is to ensure an appropriate level of aviation safety.

Depending on the requirements of ICAO, the Slovak Republic requires the introduction of safety management system by personnel of civil aviation, while ICAO expects a National Civil Aviation Security Programme from the country which is its member. It is about complying with the requirements of performance indicators.

3.2 The safety aims include for example:

- reduce aviation accidents resulting in death / serious incidents

- decrease the number of cases of entering the runway/ precipitation on the ground

- a number of inspections completed quarterly

4 SAFETY MANAGEMENT SYSTEM

We can express and define safety as the level of risk and danger for people, material goods, which can be kept and limited above or below acceptable levels while continuously assessing and managing the risk.

4.1 Civil Aviation Safety Policy of the Slovak Republic

Safety of operation and activities is one of the main priorities of the Slovak Republic in the civil aviation.

The Slovak Republic has committed to introduce, implement, maintain and continuously improve the strategies and processes which should ensure that all air activity performed under the supervision of the authorities of the Slovak Republic reaches the highest level of security in compliance with all national and international standards.(Picture 1)

Picture 1 : Hazards risks

4.2 Danger identification

In aviation, there is daily encounter with a number of risks that may endanger an individual or the entire industry. Reducing risk and developing appropriate measures to eliminate risk can be reached by a rational decision-making approach.

Every day, provisions are approved which consider the possibility and significance of any negative effects attributable to the risk in comparison with the benefits of risk-taking. Such a process is also called "risk management" and according to the guide for the management of safety (Safety Management Manual), it can be defined as the detection, analysis and removal of threats and hazards that cripple the operation of an organization. In the process of the assessment of air traffic, maintenance, airport management and flight control, risk management principles are to be applied appropriately and they are an integral component of the safety management process.

4.3 Assessment of Threats

When assessing threat, it is necessary to estimate the possibility and effect of negative consequences and while evaluating the threats, to differentiate between the threat (loss probability) and risk (the potential for threats on a time axis). (Picture 2)

The risk extent can be represented as:

- the number of losses (e.g. number of deaths per 1 000 000 seat / km)
- number of deaths, loss of income or loss of part of market
- assumption of severe accidents (such as 2 every 100 years)
- the importance of the results

Picture 2 : Hierarchy of Risk

Based on the previously stated facts, we describe the probability of occurrence as follows:

a) **probable** – which appears to be flaws in the material, which have not been repaired.
b) **can occur** - the possibility that there is a failure of a similar nature of work of employees provided there are analogous conditions of employment.
c) **unlikely** - unlikely failures contain separate phenomena and risks, where the extent of the exposure or sample size is too small.

4.4 Acceptability of risk

The types of risk need to be categorised according to risk acceptability, unacceptability and tolerability. When the risk is acceptable, no follow-up measures are taken except the circumstances of the risk reduction with minimal effort or cost.

Tolerable risks apply to persons who are able to live with the risk and therefore they receive benefits, assuming the elimination of the risk to the greatest extent.

By unacceptable risk we mean the suspension of activities in the current circumstances, to mitigate risks to acceptable levels.

Picture 3: Risk Management

4.5 Removing the risk

Even complete security does not exclude the possibility of risk. All risks should be reduced to the minimum acceptable level. Reducing or eliminating the risk requires monitoring and addressing the importance of measures obtained from the time perspective.

5 ANALYSIS OF THE DEFENSE SYSTEM

Defense systems belong among the most important part of security system and are to provide the security of mankind, property and environment.

Such systems dealing with defense may be used to:

• reduce the possibility of unintended events
• reduce the severity of the consequences of unwanted phenomena

5.1 Notification of risk

Risk notification includes mutual provision of information to be associated with risk, such as private or social statement of origin, basis, nature, effects and acceptability of risk.

There is special need of information:

- It is necessary to inform management of potential threats and damages that may arise to organization.
- People who are exposed to identified threats should be aware of their impact and the possibility of them happening
- People who find some threat must be instructed about recommended steps to minimalise the threat.
- The main need of information about specific threats applies to suppliers, regulators, the society and any other companies.

5.2 Security Management at the airport

Effective safety management system at the airport must be built on thorough knowledge of the aviation industry. It is important that the airport management advocated a positive safety culture of the airport, which will partly rely on the resources allocated to safety management, through feedback - everyday management, distribution and sharing information regarding safety between the persons providing air traffic and continuous efforts to

improve.

Depending on the extensive surrounding and environment of the airport steady and orderly access to security services at the airport is required, which is provided by the safety management system. Within this system, philosophies and policies are developed regarding safety, operation process is made coherent and feasible, and everyday operational practices are continually monitored.

Overall, the safety management system is involved in the growth of operational safety at airports.

5.3 ICAO requirements for safety management of airports

9774 document says that the safety management system should include regulations to ensure compliance with safety, security objectives, the composition of the organization, individual and group responsibilities, internal audit and security control systems, putting the emphasis on activities feasible in an attested way.

The method of threat control can be provided by the safety management system at the airport as long as these threats originate at the airport itself or where any of the airport systems is a contributing factor.

5.4 Reporting security incidents

Only those incidents which we have knowledge of are controllable. The procedure of reporting security incidents is among one of the main ways of identification hazards related to safety. Using the system for reporting incidents, the manager has the opportunity to command different opinions about the conduct of certain activities, which contributes to the recognition of the circumstances and conditions that are likely to paralyse the air traffic safety.

There are two main types of reporting schemes:

a) mandatory reporting of accidents and incidents required by applicable state law,
b) voluntary reporting of security incidents which are not reported under the mandatory reporting system.

5.5 Safety conjecture

To maintain a quality level of security at the airports, the program for periodic inspection and supervision is important. It is also necessary to define the competencies and responsibilities to prevent carry-over of responsibilities. Effective safety management system at the airports should also include the concept of safety audits dealing with all the activities at the airports. These security audits should also address the activities of the airport area operators and service providers.

5.6 Audit security

The airport operator is required to ensure the safety management system audit at the airport, including overseeing total airport equipment, they must also provide an external audit to assess the airport users, including aircraft pilots, quality-assurance- and ground-handling services and other companies that are present at the airport. It is essential that these external audits were performed by highly professional safety experts. Safety performance measurement is a process which compares the current level of security with security policies and objectives that were set up by the management of the organization.

Picture 4: Audit of Safety Management Cycle

Safety inspection on the organization level uses these means for monitoring safety performance:

a) Inspection - perhaps the simplest form of security inspection. Its objective is to review all

operational areas of the organization in terms of safety. The results of the inspections may be useful for adjusting the security of the organization.

b) Surveys - are a quite cost-effective form of getting significant information from service.

5.7 Airport Emergency Plan

The airport emergency plan describes detailed steps for each joint response of airport services and external organizations that could help to facilitate emergency. The Handbook of airport services (Document 9137) states that the airport emergency plan is intended to take account of operation in any weather and also of the possible occurrence of accidents in the area around the airport, including ditches, lakes and other areas.

6 EVAULATION OF THE EFFECTIVENESS OF SMS

The biggest benefit of SMS, which is a matter of few years, would then be the creation of such working environment where every employee is aware of their contribution to ensuring security and will automatically think of security no matter what activity they perform.(picture 5)

As every subject will have the SMS in the future, it is necessary to ensure its proper functioning so that the introduction of SMS did not just satisfy regulatory requirements or aviation authorities.

Picture 5 Active safety culture

CONCLUSION

The safety management system has been designed to ensure an acceptable level of safety across the whole organization of the civil aviation body. Its purpose is basically to realise the frequently repeated statement of many companies: "Safety first".

The aim is to reduce the number of aviation organizations, which are just hiding behind the slogan while spending only a small percentage of their efforts and financial resources on the security system.

To summarize, we can say that in the future the Safety Management System will be included in the organization of each body of civil aviation. Its implementation over this or next year will perhaps be much clearer, because the legislation in preparation should clarify some of the contradictions that are present now. To show whether the implementation of SMS will indeed be considered a successful ICAO decision, needs some time. If the introduction of SMS in the next few years really reduces the number of dangerous events, we can appraise SMS as successful. Now, however, we are still in time when the process of implementing SMS is just beginning its journey.

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