



RISK MANAGEMENT IN AIR TRANSPORT AND INSURANCE

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Abstract: Air transport inherently represents one of the most important and dynamic sector of the economy. As an important economic entity it is a key factor in the development of modern society, it is a mean of economic development and it creates one of the largest sphere of the economy. With its character it is significantly involved in ensuring sustainable development of mobility, economic growth and integration of new Member States into the European structures. Air transport represents the safest method of transport. The occurrence of aircraft accidents is in comparison with other methods much lower, but the consequences of accidents in air transport are often, for the crew of the aircraft and passengers, fatal. Air accidents cause injuries, fatalities, property damage and damage to third parties. The growth potential of air transport is not exhausted. Competition is increasing, there is a boom in airlines, terms of service providing are changing within every individual airline leading to an expansion of the risks and their subsequent elimination. In this paper I focused on the risk management in civil air transport and the possibility of eliminating the financial impact of the risks by means of the insurance.

1. AIR TRANSPORT CHARACTERISTICS

Despite the fact that air travel is the latest method of transport, it represents one of the most important sectors of the economy. The huge expansion of aviation is dated from the early 20th century, and its volume is still growing.

The use of aviation throughout the world lags far behind the USA, where this method of transport is annually used by 60% population, while in Eastern Europe it is only 0,4% and in China 0,05% of the population. However, these figures are also highlighting the enormous potential for growth in this sector, whether in Europe or in Asia. Growth potential of the aviation market and flexibility of conditions have resulted in increased competition that forces airlines to expand or reduce its prices. (Harding, Maddocks, Moss, & Pryde, 2002)

Air transport is the safest method of transport. Qualitative and quantitative criteria of each method of transport vary in speed, comfort, economical aspect and especially in safety. Air transport maintains leading position according to these criteria.

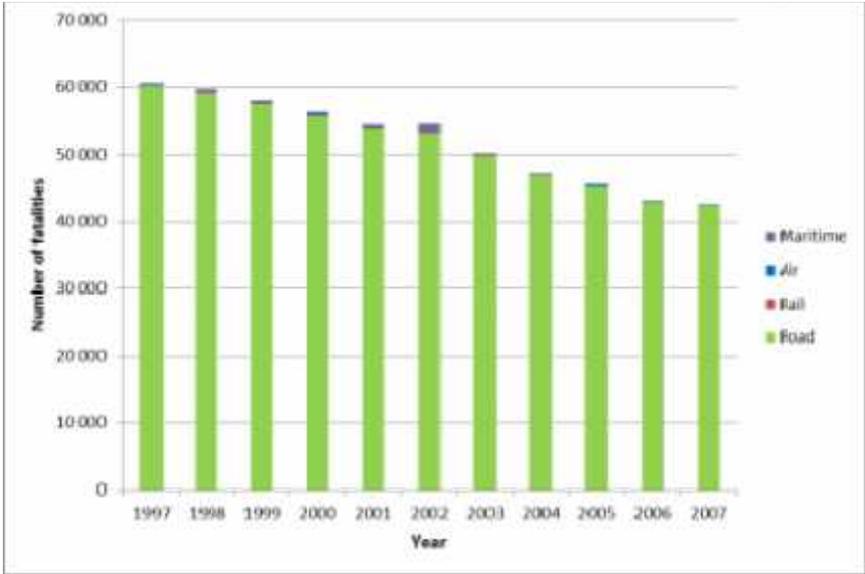
2. AIR TRANSPORT SAFETY

Significant and most widely discussed issue is the question of security. Statistics point to the fact that with the increasing number of flights is increasing the number of accidents and fatalities. The occurrence of aircraft accidents when compared with other methods of transport is much lower, but the

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consequences of accidents in air transport to the flight crew and passengers are often fatal. Air accidents cause injuries, fatalities, property damage and damage to third parties.

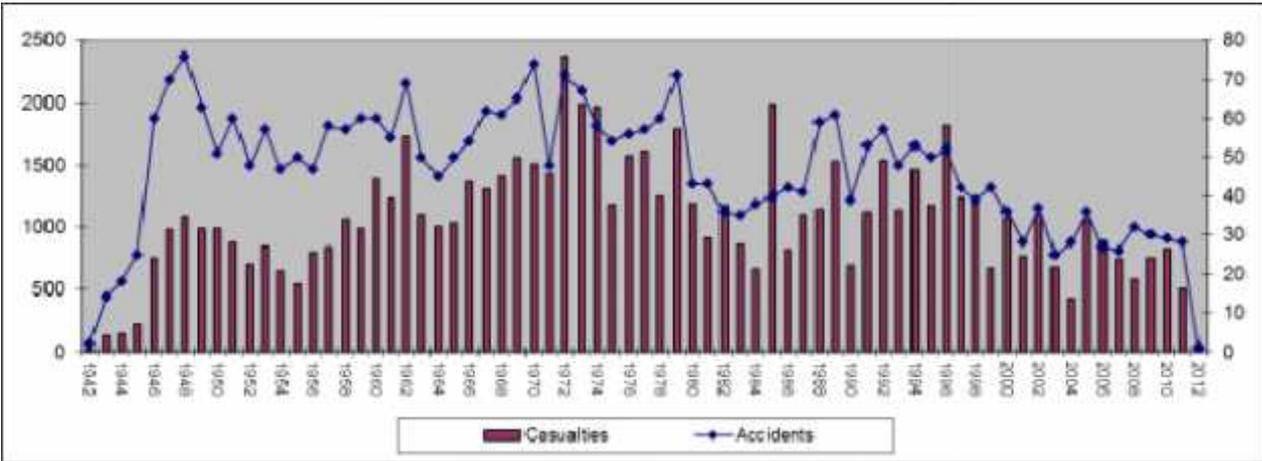
Air transport along with rail transport represents unrivalled the safest method of transport. The European Commission’s report of 2010 provides an overview of the mortality for each method of transport within the Community during 1997 – 2007 (Picture 1).



Picture 1 Number of road, rail, air and maritime fatalities in EU27 between 1997 – 2007 (Transport accident fatalities (TERM 009) - Assessment published Jul 2010, 2010)

2.1. History of development in aviation safety

The following chart (Picture 2) shows the gradual increase in aviation safety from 1942 to present. The statistics are based on data of the Flight Safety organization and shows the number of accidents and fatalities in different years aboard of aircraft in civil aviation operations.



Picture 2 The number of fatal airliner hull-loss accidents and fatalities (casualties) per year (Fatal airliner hull-loss accidents, 2012)

Major impact on air transport safety has had the development of aviation technology, whose influence was over enormous drop in accidents. On the other hand, technical progress has increased the complexity of systems along with the requirements on the crew, leading to an increased number of accidents caused by human factor. Currently 80% of air accidents are caused by failure of the human factor.

ICAO statistics shows the following failure classification: procedure failures – 40,8%; communication failures – 9,7%; knowledge/skills – 9,2% and staff incapability – 40,3%. (Oros, 2010)

It is also important to mention that within the aviation accidents there is also monitored the phase of flight. It was found that 50% of all accidents occur within the approach and landing, which represents only 4% of total flight time, plus 27% of accidents occurred during take-off and initial climb, which represents about 2% of total flight time. Simply from the sum thus we found that more than 3/4 of all aviation accidents occurred in these relatively short segments of flight. (Oros, 2010)

3. RISK ELIMINATION IN CIVIL AIR TRANSPORT AND POSSIBILITIES OF THEIR INSURANCE

The world, in which we live, is characterized by a number of uncertainties and random events. Negative, adverse and unexpected phenomena that occur in all sectors of human activity are a part of community life. Accompanying feature of each purposive activity is the potential occurrence of a random event that represents the existence of risk as a negative deviation from expected result which needs to be insured.

Insurance can be understood as a protection against risks, where the insured transfers their risks, whose potential consequences of the loss ratio from their individual point of view are unacceptable, to the insurer who with a sufficiently large set of risks of a similar nature is not only capable to cope all the taken risks by using collected premium, but they might become also the subject of a profitable commercial activity.

Insurance is a specific kind of financial service, where the insurer for reimbursement provides insurance coverage for the taken risks so that if an insured event occurs, he will provide to the insured the insurance benefit. (Majtánová, 2005)

Insurance, therefore, can be defined as a financial tool to eliminate the negative consequences of random events. (Ducháčková, 2005)

These random events we identify as insurance risks. *Insurance risks* are caused by natural forces, regardless of human activity or directly through human activity. Their impact may cause *damage* to health or property. Quantified damage is called *loss*. Realization of risks leads to the insured event, in which the conditions stipulated in the *insurance contract* will lead to a financial compensation of the insured, i.e. compensation for the damage through *insurance claims*.

Other insurance company activities include preventive activity and reinsurance.

Preventive activity is focusing on the prevention of damage, a measures aimed at reducing risk and loss.

Reinsurance is defined by the Insurance Act as “taking insurance risks by a reinsurance company [...], risk valuation and management, management of reinsurance contracts, the creation of technical reserves [...], providing benefits from reinsurance contracts and the providing consultancy services in the insurance industry.” (Zákon č. 8/2008 Z.z. o poisťovníctve a o zmene a doplnení niektorých zákonov, 2008)

Reinsurance activity, respectively reinsurance can be characterized as insuring the insurance. It is a specific form of insurance, in which the insurance company “transfers to the reinsurer part of the risks that go beyond his financial capacity, and would upset the balance of its portfolio.” (Majtánová A. , 2006).

3.1. General definition of risk

Within the insurance industry, risk represents the possibility of an event that is the subject of insurance - insured event. The risk is not an insured event by itself, it indicates only a potential possibility of its occurrence.

In terms of insurance, *risk* is understood as a positive as well as an adverse event in the life of a man. (Cipra, Pojistná matematika v praxi, 1994)

In insurance, the term “risk” also refers to:

- object threatened by random danger (e.g., building, household, machinery),

- event, causing damage and thus represents a source of risk (e.g. accident, theft, natural hazards),
- likelihood of an incident, whose effects are negative for an economic entity. (Chovan, 1996)

The size of the risk is determined by two factors:

- *frequency* – frequency of risk occurrence
- *seriousness* - quantifiable extent of the damage caused by the implementation of risk

Event subject to insurance must meet the following criteria:

- *randomness* - it must be random in nature, it is unclear whether it will ever occur and when,
- *identifiably* – the cause of risk, should be detectable,
- *calculability* – loss itself must be quantifiable,
- *economic acceptability* - insurance must be economically feasible for the policyholder and the insurer as well.

In the case of insurable risk, it is necessary to take into account the problem of asymmetric information and systemic risk.

Asymmetric information reflects the differences in awareness of the likelihood of potential losses between insurers and clients.

Systemic risks are dependent risks, which cause at the same time loss to a large amount of economic entities. Since in such cases, the amount of insurance claims paid considerably exceeds the amount of premiums received, insurance companies against such risks provide reinsurance, or geographic distribution of insured risks.

3.2. Risks in air transport and the possibilities of insurance

According to the European Parliament and Council Regulation (EC) nr. 785/2004 and insurance requirements for air carriers and aircraft operators it is necessary under the common transport policy and consumer protection promotion to ensure the lowest possible adequate level of insurance to cover liability of air carrier in respect of passengers, luggage, cargo and third parties.

Aircraft insurance provided by insurance companies is governed by the insurance contract, general insurance conditions, contractual arrangements and generally binding regulations governing insurance.

Risks insurance associated with aviation comes under non-life insurance.

3.2.1. Risks in air transport

In terms of insurance to the risks in aviation belong:

- the risk of damage, destruction or theft of the aircraft,
- the risk of death due to accident or permanent consequences of injury,
- the risk of damage to property caused by aircraft to third parties,
- the risk of death or injury of third parties caused by aircraft,
- the risk of damage to luggage or cargo during transportation,
- the risk of terrorism.

To the risk insurance of the aviation industry are linked the following life insurance classes:

- accident insurance.

The content of accident insurance is:

- insurance against death resulting from an accident - in case of death resulting from an accident within a certain period, the insurance company pays the entire sum specified in the contract

- insurance in case of permanent consequences of injury, respectively insurance against disability resulting from injury,
 - insurance of the time required to treat the consequences of an accident,
 - insurance of interventions undertaken to treat accident consequences,
 - accident insurance of the seats.
- insurance of damage caused to aircraft, which is a form of transport insurance.

Transport insurance is a damage insurance, which may be caused on different types of vehicles or goods, during the transport itself as well as during the preparation of goods for transport. In addition to these losses transport insurance includes salvage costs, screening costs and a contribution to a common accident. The importance of transport insurance is that the carrier is liable only for damages caused by his fault. This type of insurance with coverage of e.g. catastrophe risks or the risks caused by human factors (vandalism, theft etc.) provides wider insurance cover.

Distinctiveness of this type of insurance is the close cooperation of the insurance market participants. This is especially the fact that the subject of insurance represents relatively a small number of aircrafts, their value is very high, as well as the damage they can cause. The insurance claim from occurrence of damage in the air transport is moving at high values.

As, such risk cannot be taken by any economic entity or country, there is a use of reinsurance. Nevertheless in some states the cover must be provided by domestic companies and most of the underwritten risk that is ensured is on the international reinsurance market. (Cipra, Zajištění v pojišťovnictví a jeho matematické aspekty, 2004).

3.3. Evaluation of the identified risks

An essential part of the risk management process is to identify all hazards, i.e. risk factors that may affect air traffic and cause higher or lower losses. Risk factors are technical and human characteristics of objects and activities that affect risk, i.e. likelihood of a negative phenomenon and its impact.

With identifying risks we analyse them and we describe the most vulnerable parts of the system. Risk assessment is the final phase of risk analysis and it requires performing an analysis of the likelihood of a negative phenomenon - analysis of abundance, analysis of possible consequences and their mutual relationship.

Mutual combination of likelihood and consequences of identified risks to the company represents the risk matrix. It is a simple tool to assist management decision making and a mechanism to increase visibility of risks.



Picture 3 Frequency-severity analysis matrix (risk matrix) (Chang & Lin, 2008)

CONCLUSION

Many airlines nowadays have to face various consequences after the accident in September 2001. Aftermaths of the accident include declining number of passengers, higher costs to service providers, higher insurance premiums and security costs.

With continuous improvements in aviation safety, strict supervision of compliance with safety requirements, ensuring the safety of flight operations and a number of other measures, the number of human casualties in aviation accidents year-by-year is significantly lower.

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