

# THE METEOROLOGICAL FACTORS IN THE DECISION MAKING OF AN AIR MANAGEMENT

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The article describes the impact of meteorological factors on the decision of an aviation manager. It provides summary analysis of decision-making, classification of airline managers, ways of obtaining meteorological information, describes the meteorological factors which may affect the decision-making of aviation manager. Article content is also evaluation of a questionnaire whose main task was to find out the extent to which decision of aviation manager influenced by meteorological factors.

**K e y w o r d s:** Meteorological factors, aviation manager, decision making

## 1 INTRODUCTION

Decision making is one of the processes carried out daily and it is a part of every person's life. Decision making is one of the basic management functions and the ability to know how to make the right decisions, becomes one of the basic attributes which are required in the selecting of manager. Each organization carried out a large number of simple but also difficult decision-making processes, which are influenced by various factors, which need time, knowledge of the issues, detachment, working in teams but also the intuition. The aim of each decision-making process is the selection of the most suitable alternative of solution with respect to the defined aim.

The aim of this work was to analyze the decision-making process and also meteorological and climatic factors affecting the decision-making of the air manager. In an exploratory part was required to compile a questionnaire to survey among the airline managers and conducting a survey to determine whether and to which extent meteorological factors have influence on the decision-making by contrast to other factors.

## 2 DECISION MAKING

Decision making and taking decisions are basic for any management. Through the decision-making process management entity decides about development of controlled object. Decision-making processes are carried out in any organization, society, and the political group. To understand the management as process to achieve the objectives in the organization, have an important role in the gradual solution of management problems deciding. Decision making related with all aspects and phases of management. It is the process of choice and consists of an assessment of options and selection of the most suitable variant considering on defined aim and factors. In the decision making process we know different kinds of decision making and different methods. Decision making process is complex and therefore some situations require some time, teamworking, knowledge of the issues, and use different methods to arrive at the required result. Decision making with the planning, controlling, organizing, monitoring, communication and control is one

of the basic management functions. These functions overlap each other and complement each other.<sup>1</sup>

### 2.1 The basic elements of decision process

Decision making process include the following basic elements: aim of decision making, decision-making criteria, the problem of decision making, subject of decision making, the object decision-making, decision-making options and their consequences, states of the world, methods and decision making phase.

### 2.2 Phases of decision process

Decision making process we can divide into various phases. According Majtán<sup>2</sup> decision making is divided into seven phases:

1. Formulation of the problem and determine the aim
2. Analysis of deciding factors, set rules and decision making criteria
3. Finding and creating variants
4. Assessing the impact of the choice of the proposed options
5. Evaluation of alternatives
6. Adoption of the Decision
7. The final formulation of the decision

### 2.3 Classification of decision making

Decision making can be classified according to a relatively large range of criteria that allow us to move decision processes in certain types of decision-making. For example, in term of information we know decision making under certainty, uncertainty and risk. In term of time exists strategic, tactical and operational decision making.

### 2.4 Methods of decision making

Methods of decision making can be understood as the rules and procedures which respecting should be reached on the choice of the best alternative solutions to the problem of decision making and adoption of best decisions. Recently, managers can use a large number of decision making methods and can be classified according

to several criteria. Most often, however, we meet with the following classification.<sup>2</sup>

a) empiric methods - are based on knowledge, practical experience and intuition of managers or experts in certain areas of management. These methods can be divided also more detailed namely the empirical-intuitive method, empirical analysis and expert methods<sup>2</sup>

b) exact methods - The basis of these methods is algorithmization of decision making process, the possibility of solving a mathematical model views. It is especially when dealing with the decision situations that are repeated and the relationships between model elements are expressed quantitatively. This includes Economics and Statistical Methods and Methods of Operational Analysis<sup>2</sup>

c) heuristic methods - heuristic methods creates the conjunction between exact and empirical approach in decision making. They are based on general knowledge of decision theory. Where possible, take over knowledge of the exact methods about modeling the solved problem. In addition, these methods use creative skills and experience of the manager. Between basic decisions heuristic methods include decision tables methods, decision analysis method and the method of decision tree.<sup>2</sup>

### 3. MANAGERS IN AVIATION

Manager or director also works in every organization. Every manager at work uses adequate managerial functions, skills and work style. His main tasks are to decide, guiding and motivating employees, evaluation and compensation of employees, achieving the planned results of the organization, management of technical, human, organizational and economic resources. Manager means any senior manager who plans, organizes, decides and controls. Managers also occur in aviation, and them is devoted this part of work.

The highest, strategic level of air management are the Ministry of transport, construction and regional development - Section of Civil Aviation, Transport Authority and Air Traffic Services. However, work is aimed at managers at the airport, where due to different organizational structure may exist different number of directors - airline managers. Organizational structures are different in each country and depend on the size of the airport and its importance in the system of national and international air traffic, also on the form of governance and legislative conditions in the country.

In general, however, each organizational structure should provide:

- ❖ commercial provision
- ❖ operational support
- ❖ technical support and maintenance

- ❖ financial security
- ❖ fire and rescue security
- ❖ protection and control of airports and passengers
- ❖ administration

The big chief to all organs of the company and fully responsible for the operation of the airport and its activity is **executive director of the airport**. For ensuring the maintenance and repair of aircraft, maintenance of buildings, route and vehicles at the airport, is responsible technical department, which manages the **Director of Technical Department**. Section of airport security is headed by a **Director for Safety**, which is responsible for carrying out preventive measures to airport security. Operating section provides ground handling of aircraft operations that is passenger and ground handling and activity ground service equipment and ensure their service. This includes also operation of aircraft loading, which realized the loading and unloading luggage and cargo. To this section the senior director is **director of commercial-operating section**. Section of rescue and fire fighting service is managed by the **commander of rescue and fire fighting services**. To the manager of aviation is also possible to include the aircraft commander, because the performance of their work is very important to make the right decisions. **Pilots** must cope with emergency situations and decision-making at critical moments such as when a technical error, the sudden change in weather conditions etc.

### 4 INQUIRIES OF METEOROLOGICAL INFORMATION

In order to air managers make the right decisions it is necessary to stay informed about weather phenomena which may affect their judgment. Meteorological information are provided by Air Weather Service and the responsibility for their use have the user of meteorological information.

To be able to provide weather information to all interested persons at the airport the weather bureau establishing airports aeronautical meteorological stations. This stations made weather observations at fixed time deadlines and on the basis of these observations are built basic meteorological informations.<sup>3</sup>

Exchange of airport forecast between weather services is performed by:

- ❖ Terminal Aerodrome Forecast TAF
- ❖ In abbreviated plain language
- ❖ In teletype form

### 5 METEOROLOGICAL FACTORS AFFECTING THE DECISION MAKING OF AIR MANAGER

Deciding of the aviation manager is influenced by various factors. One factor is the weather - meteorological and climatological factors. However, these

factors do not affect the work and decisions of all airline managers.

Impact on the work and decisions of managers in aviation may have all the meteorological factors but the most important are the following: snow, icing, wind, visibility rainfall and also the ornithological situation.

### 5.1 Snow and icing

Snow and icing affecting the decisions of the aviation manager in winter. Snow is a form of frozen water, and is formed at temperatures below 0 ° C. Icing falls in terms of aviation to one of the most dangerous weather phenomena, which, despite modern means to combat it is for air traffic remains a serious problem. It forms mainly on the surface of the aircraft and causes a change in aerodynamic characteristics of the aircraft.<sup>4</sup>

### 5.2 Wind

Wind is described as a dangerous phenomenon, because in some cases may affect the operation but also the safety of air traffic. Direction and wind speed has a significant impact on take-off, landing and the flight of the aircraft. Wind can be defined as the horizontal flow of air in the atmosphere. It is caused by differences in air pressure. Wind speed is expressed in m/s, km/h or knots.<sup>4</sup>

### 5.3 Visibility

Visibility is distance at which it is possible to detect objects during the day and at night the lights of normal intensity. Visibility is most often worsened of water droplets, ice crystals, or mixtures thereof that float on ground layer of air.<sup>3</sup>

### 5.4 Rainfall

Rainfall is another factor that can have influence on decision-making and running of the airport. We can define them as products of condensation or sublimation of water vapor that falls from the clouds to the surface in liquid or solid form. We can divide them according to various criteria such as according the consistency to the liquid, solid and mixed.<sup>3</sup>

### 5.5 Ornithological situations

Operation of the airport is partly threatened by the ornithological situation that is aircraft collisions with birds or other animals. These deductions can pose a lot of damage and losses for air carriers. They also have a considerable share of the secondary losses incurred delays and cancellations. Most collisions occurs in the airport and its immediate vicinity in approach phase, landing and take-off and climbing after take-off.<sup>5</sup>

The main aim of the survey was to determine the extent to which meteorological factors affecting the decision-making of airline manager as opposed to other factors.

On the basis of the objective was defined following two hypotheses:

**H1:** Meteorological factors are important in deciding of aviation managers

**H2:** The Importance of meteorological factors in deciding depends on the position of Aviation Manager

The survey was conducted by a quantitative method, using a questionnaire, which was targeted to a specific group of respondents - to airline managers. The questionnaire was anonymous and consisted of seventeen questions. In the questionnaire, I questioned the basic demographic data to characterize the group of respondents (age, gender, education, job title). Then were followed questions about the fundamental nature of deciding of respondents, and the last questions were directed specifically to meteorological factors and their impact on decision-making and the resources of obtaining the meteorological information and its reliability. The survey was conducted both direct and indirect way, that is sent out by e-mail and direct addressing of respondents.

### 6.1 Survey results

The analysis of the questionnaire shows that this sample is composed mainly of the men and average age of the respondents ranges 18-35 years. It is mainly university educated respondents in the aviation industry. Prevails work positions on commercial operating section and technical section of airports. Independent decisions make more than half of the respondents to the day to day level. Decisions are mainly made by the respondents on the basis of rules and regulations and in older respondents also on the basis of practical experience. Respondents most frequently indicated three factors that are taken into account in decision-making, time, weather factors and financial factors. Their decisions according to the information most often take place during the period of certainty and in terms of seasons, most respondents indicated that does not matter on period in which their decisions are more difficult. With underestimation of meteorological factors in deciding the majority don't have personal experience. The most common sources that collect information about weather reported the official site SHMÚ and climatic characteristics and the useful kind of information about the weather is a formal aerodrome forecast TAF. Most respondents apply meteorological information at the planning stage. Finally, they should indicate the factors that have the most influence to their decisions and in their replies prevailing meteorological factors snow icing and rainfall.

## 6. EXPLORATION PART

The survey confirmed two hypotheses, which were confirmed by the question "What factors do you take into the account during deciding?" The results are shown below.

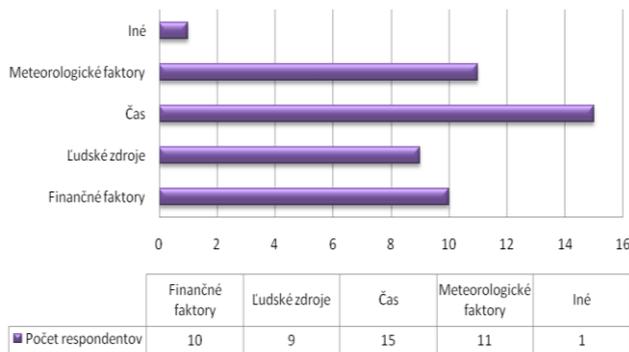


Diagram 1. Evaluation of question

As we can see in the diagram, the most important factor in deciding is the time that marked the 15 respondents. In second place are the meteorological factors and the third are financial factors to take into the account during deciding ten respondents.

Meteorological factors when deciding taken according the questionnaire into account in particular technical section staff and staff commercial operating section, as well as air traffic control worker said that meteorological factors as one of the factors taken into the account during deciding. Upon closer inspection of the questionnaire to 6 of 7 staff of the technical section marked meteorological factors in factors influencing their decision. On commercial operating section marked these factors, only two of the eight respondents.

It is important to note that the survey is due to the low number of respondents only indicative and can't be considered scientifically sound, but suggests that the hypotheses have been set correctly.

## 5 CONCLUSION

At work I have devoted the influence of meteorological factors on the decision-making of aviation managers. The aim was to analyze the decision-making process, describe the meteorological and climatic factors affecting decision-making of aviation managers and create a questionnaire in order to determine the extent to which meteorological factors are involved in decision-making of aviation managers.

The main aim of the survey, which was conducted using a questionnaire was to determine the extent to which meteorological factors affecting the decision-making of airline managers as opposed to other factors. The conclusion was that the meteorological factors have an impact on the decision-making of airline managers, but the extent of their influence depends on the work position of aviation managers, confirming both predetermined hypotheses.

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