

QUALITY REQUIREMENTS FOR THE AIRPORT OPERATION METEOROLOGICAL SUPPORT

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The text is content aimed to drawing up the issue of quality requirements for the Airport Operation Meteorological Support. The introductory part contains the definitions meteorology, weather, atmosphere, meteorological elements and atmospheric events, their description and the impact on safety, fluency and efficiency airport operation. The center's work is described legislation in this area, the analysis of meteorological airport security, automated weather observing systems. The body of the thesis describes the quality in aviation and quality requirements for the modernization of automated observing systems and weather evaluation. These standards are an essential working tool for creating high quality and safe operation of the airport. Good knowledge of quality requirements is needed in applying these and also new methods in practice.

Key words: safety, aviation meteorology, meteorological support, automated weather observing system, quality.

1 INTRODUCTION

Safety is a condition where there is an elimination of the existence and impact of all dangerous factors affecting air traffic. Influence weather is a threat to aviation safety, which can't be underestimated. Aviation Meteorology is the science that deals weather examines and evaluates the data. Forecast data of weather can facilitate or prevent the occurrence and incident in aviation. Today, the aviation high demands to fly in any weather. The importance of operational safety of the airport led to the emergence of various observation systems for weather and evaluation of weather data. The issue of quality requirements for the operation of the meteorological aerodrome is subject of numerous studies.

2 AVIATION AND METEOROLOGY

Safety is the most important parameter in aviation, increasingly be seen as a security risk management. Meteorology comes from the Greek word. Μετεωρολογία means meteoron „high in the sky“, and logos „science“. Meteorology is a science dealing with the earth's atmosphere, its composition, structure, properties, phenomena, and events the current in the atmosphere, such as weather. Meteorology is considered as a part of physics, it is also called to as the „physics of the atmosphere.“

Meteorology is used in various areas of life in connection with the army, in the production of energy, in agriculture, construction and transport also. Meteorology is of great importance in a variety of industries in sectors of the national economy as well as in the aerospace industry. Weather can ever affect the safe and smooth flight of aircraft, has a great impact on the safety, regularity and efficiency of air traffic, regardless of whether the aircraft is flying under the terms VMC (Visual Meteorological Conditions) or IMC (Instrument Meteorological Conditions).

For each pilot are very important understanding the current weather observations, analyzes of meteorological elements and their impact during flight. The impact of meteorology in aviation can lead to a variety of accidents and incidents, so the weather conditions can't be underestimated. All masters and also

flying personnel must know the weather service organization, able to assess the weather conditions before the flight and also during the flight. What is important is to understand the meteorological knowledge basis and documentation for the flight and the ability to understand specialized aviation weather forecasting. Combining these predictions and understanding of administrative decisions during flight means that the pilot is skilled. Meteorology is divided on meteorological elements and weather conditions.

3 METEOROLOGICAL AIRPORT SECURITY

Constantly growth air traffic, it is necessary to spend more and more effort to maintain security and safety. Safety is important in the management and operation of the airport itself, which is affected by several security factors.

Weather is one of the influences that can in no way be affected, but the weather itself aviation and its operation affects. More and more effort is devoted to the adoption of new measures and the creation of systems to ensure and maintain safe and efficient operation. There are many information systems that use the airport, they include aeronautical fixed network telecommunication – AFTN, complex information system airport – KLIS, automatic monitoring system AMS, SITATEX, TIMATIC, GEATAN and GUIDE.

3.1 AMS

AMS is an automated monitoring system mainly, which is used in the evaluation of the air traffic controller weather information for the airport. AMS provides for airport dispatcher a wide range of information about the current state of the weather. AMS is also used for conditions of low visibility values for the coordination of operational components.

The objective of AMS is to control light signaling and safety devices and monitoring systems, and airport facilities, such as:

- light signaling and safety equipment take-off and landing runways,

- radio navigation equipment and systems,
- electricity equipment, spare and back-up resources,
- surge protection,
- operating conditions when visibility categories CAT I, II and III,
- emergency procedures for emergency and accident situations.

2.1.2 AWOS

Automated weather observing system is one of the oldest automated weather stations. An Automated Weather Observing System, or AWOS, is defined as a suite of weather sensors, which measure, collect and disseminate weather data to help meteorologists, pilots and flight dispatchers prepare and monitor weather forecasts, plan flight routes, and provide necessary information for correct takeoffs and landings.

AWOS Standard Sensors are Wind Sensor, Redundant Altimeter, Relative Humidity (Dew Point), Air Temperature, Visibility, Freezing Rain, Cloud Height and Cover, Precipitation Type, Precipitation Amount, Lightning, Runway Visual Range (RVR), Optionally, the system can measure Soil Moisture and monitor the area with video.

2.1.3 ASOS

Automated Surface Observing System was especially designed and developed to meet the needs of aviation meteorological community. An Automated Surface Observing System, or ASOS, as defined by the Federal Aviation Administration (FAA) and the National Weather Service (NWS), is a suite of weather sensors which measure, collect and disseminate weather data to help meteorologists, pilots and flight dispatchers prepare and monitor weather forecasts, plan flight routes, and provide necessary information for correct takeoffs and landings.

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3 QUALITY

Quality is evaluated capabilities to meet customer requirements. Satisfy the customer's requirements, is very difficult because changing rapidly. Plays a crucial role in a person who is a customer, and plays a crucial role as part of a company which manufactures a product, provide service and by his personal, professional and ethical quality and the potential opportunities and determine the company's ability to meet goals and achieve economic and economic growth.

The quality in aviation is achieved a safety, accidents, environmental impact, but also depends on customer satisfaction, which also takes into account the speed, convenience, quality, service and the like. The construction and improvement of quality management systems in the world used three concepts and the concept of business, industry standards, concept of (TQM) total quality management and ISO concept.

3.1 Quality in Aviation

In the Air transport is started to deal the systems quality management. JAR requirements dictate implement a quality system for the individual sections. It is preferred to build a quality system for the entire organization as a whole, because of full operation of the quality system, ensuring the flow of information, mutual responsibilities and other activities. Uniform quality system shall implement airport operator who determines the leader quality, which monitor compliance with the required safe operational practices and airworthy aircraft. The system includes quality assurance program. In building quality management system Air carriers using the concept of ISO standards.

3.1.1 Certification

Voluntary implementation of the system quality management is can obtain a certificate. The Certificate is awarded by a certification body. Certification is a confirmation of the functionality of the quality management system by a third party, subject to certain requirements and the actual evaluation of the certification body. Certifying Authority issues certificates that are internationally valid as a as for Slovak Society for Quality. Building a system of quality management, documentation creation, describing individual processes, records management and main obtaining the certificate of the organization creates all the conditions for the provision of quality services. After successfully certified, organization is always looking for new ways to improve.

4 QUALITY REQUIREMENTS FOR THE AIRPORT OPERATION METEOROLOGICAL SUPPORT

Air traffic, like any other type of traffic, trying to ensure the highest levels of security. Reducing risk and risk avoidance is achieved by the security. Never is achieved complete safety. Within the transport itself can't achieve 0-percent risk. Weather in aviation is a safety hazard. Weather is a summary of operating atmospheric conditions in a particular place and time. Tilt of the Earth's axis is changing day length and temperature, and formed various seasons. The advantage is weather forecasting, which makes ensuring safe, efficient and regular air transport operations. The Slovak Republic airports using various information technologies. To

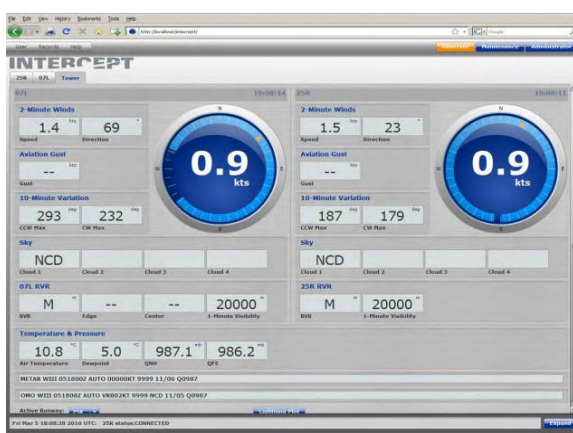
evaluate weather information using an automatic monitoring system that uses the airport dispatcher. Various created technical meteorological systems to predict the meteorological elements and phenomena, in order to achieve aviation safety. Depending on the device type, precision instruments may change, as a result, all operational characteristics equipment must be checked before selecting.

The calibration system must be identifiable and verifiable. All systems must be regularly inspected and calibrated on ensure the functionality and effectiveness of the use of different systems. Adherence to quality requirements and obtaining certification will greatly increase the credibility and reliability to customers and other interested parties. Quality management system requirements impose the JAR. JAR requirements dictate implement a quality system for the individual sections. It is preferred to build a quality system for the entire organization as a whole, on ensuring the flow of information, mutual responsibilities and other activities. The Slovak Republic aeronautical meteorological offices are equipped with automated weather observing system.

The following figures are shown screen monitors AWOS Coastal U. S. states. user interface software. Day and night viewing screens are selectable as well as desktop and console views.

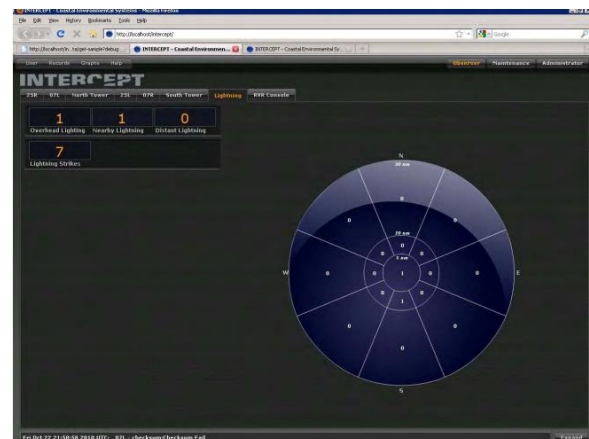
User interface software:

- Full METAR and SPECI report
- RVR screen
- Thunderstorm Lightning screen
- Edit screens for METAR and SPECI
- Night view screen
- Can be viewed with simply an INTERNET browser
- Many built-in self diagnostics
- Remote Maintenance Monitoring



- The RVR display screen shows the runway designators, the Touchdown, Midpoint, and Rollout readings, as well as the Edge and Center runway light step settings
- Thunderstorm screen
- Can note strikes as far as 80 km
- Easy to read

- Diagnostic and troubleshooting information for each LRU
- Troubleshoot, disable or enable sensors, and pass-through to directly chat with the sensors
- Direct data viewing from the serial ports
- View the status and latest message at each external interface
- View raw sensor data
- View historical record of errors
- View and print log files
- Drop down menu for viewing and setting the System Configurations and Site Initialization Parameters and backup and restore of all site parameters.



4.1 AWOS at the airport Košice

Airports in the land of the Slovak Republic are equipped with an Automatic Weather Observing System. The central unit of airport Košice AWOS system consists of a single computer.

AWOS at the airport Košice provides:

- Communication, acquisition and processing of all the measurement data from all measuring devices,
- Compilation of reports in accordance with ICAO Annex 3,
- Sending information and reports in real time,
- Collaboration with other systems used to provide air traffic at the airport (telecommunications center SHMI),
- Connections to automatic information service TMA ATIS and monitoring system to evaluate the conditions in low visibility LVP,
- Communication with computers, measurements, archiving, processing and transmitting information.

Quality requirements of individual systems are constantly changing, enhance, grow. After the introduction of a quality management system in the organization, in this case the airport to facilitate the certification system, increase the trust to the customer. The certificate process required a lot of hard work and

demonstrates continued commitment to our customers, the quality of our products, and our culture of continuous improvement. Obtaining a certificate to the pursuit of quality does not end, just the opposite is seeking new ways to improve quality. Data quality AWOS system is achieved by regular inspection and maintenance.

Regular maintenance of the airport AWOS includes:

- diagnostics and setup:
 - of all connected sensors AWS, meters RVR MTECH TH 5000-200, Biral VPF-730, Vaisala Mitras,
 - meters on the lower end of the cloud CBME80 Eliasson, Vaisala CT25K,
 - sensors on the weather FD12P,
- control:
 - of transmitters,
 - of communications equipment,
 - of cabling,
 - of surge protectors.

4.2 Modernization AWOS at the airport Košice

Requirements for modernization AWOS at the airport Košice:

- Providing a central unit consisting of two interconnected and back up computers
- Information processing and assembly of regular and special reports and METAR SPECI, local reports MET REPORT, SPECIAL and synoptic reporting SYNOP focusing mainly on visibility, cloud cover and the condition of the runway
- The requirement to ensure continuous operation and AWOS data backup, archiving of all measured and processed data, separate store all output data feedback in a particular point in time,
- The requirement to display data in real time via communication lines,
- The requirement to distribute the necessary information into the system for displaying information for workplace air traffic control
- Software will conform with the system at the airport in Bratislava,
- From the central unity of hardware equipment is required for the continued operation and the ability to connect all devices.

5 CONCLUSION

There is no doubt that the key parameter in aviation is safety. Meteorology is of great importance in various industries and also in the aerospace industry. Weather can ever affect quality safe and smooth flight of the aircraft. Quality is the degree to which a set of properties meets the requirements. The quality in aviation has reached safety, no accidents, environmental impact, but also depends on customer satisfaction, which shall also have regard to speed, comfort, quality of service and

the like. The aim of the work was technical specification and monitoring systems, monitoring meteorological situation at the airport and qualitative analysis of the demands for security in aviation meteorology. Attention should be paid to the various proposals to modernize the automated weather observation system. Quality requirements are the most important part of success.

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