

# Implementation Guidance of Aeronautical Meteorological Observer Competency Standards

The following guidance is supplementary to the AMP competency Standards endorsed by Cg-16 in Geneva in May 2011. Please note that the information contained in this guidance material replaces that which previously existed in the publication, 'Supplement No.1 to WMO-No.258.'

## Format of the Descriptions

The text is structured according to the following format:

Position title: Aeronautical Meteorological Observer (AMO)

Application conditions: (from WMO-No. 49, Volume I)

- A. *for the area and airspace of responsibility,*
- B. *in consideration of the impact of meteorological phenomena and parameters on aviation operations, and*
- C. *in compliance with aviation user requirements, international regulations, local procedures and priorities.*

Top-level competency Standard (also from WMO-No. 49, Volume I)

- Competency descriptions for each standard
- Performance criteria for each standard

Background knowledge and skills  
Regional variations.

The importance of the preamble to the top-level competency Standards is emphasized. There will be considerable variation in the legitimate functions of aeronautical meteorological offices worldwide, and it is not possible to write a document that exactly matches every office's function. Therefore the performance criteria should be applied in a way that is consistent with these variations. For example, it is recognized that meteorological offices in the tropics will not have a responsibility to observe blowing snow (Performance criterion 2.1). The conditions A, B and C provide for this.

It is intended that the responsibility for meeting the Top-level competency Standards will, in the first instance, rest with the organization to which the AMO belongs. The responsibility of the individual will then be to meet (or exceed) the particular competencies which apply to his or her specific job within the organization (usually specified in terms of a job description).

In some organizations, the competencies may be collectively satisfied by a team or by multiple groups. In such cases the organization is responsible for ensuring that each individual does his or her part of the job to the required standard so that the Top-level competency Standards are met.

The role of observers will continue to change in response to evolving technology and user requirements. The guidelines presented in this document attempt to anticipate as far as possible imminent changes, but a review cycle of not more than 3-5 years as part of the overall Quality Management and Risk Management approach is strongly suggested.

## **1. *MONITOR CONTINUOUSLY THE WEATHER SITUATION***

### **Competency description**

Weather parameters are appraised to identify the significant and evolving weather phenomena that are affecting or will likely affect the area of responsibility throughout the watch period.

### **Performance criteria**

1. Analyse and describe the existing local weather conditions.

## **2. *OBSERVE AND RECORD AERONAUTICAL METEOROLOGICAL PHENOMENA AND PARAMETERS***

### **Competency description**

Observations of weather parameters and phenomena, and their significant changes, are made according to documented thresholds and regulations.

### **Performance criteria**

1. Perform and record routine and non-routine observations of the following:
  - surface wind direction and speed, including spatial and temporal variations
  - visibility for aeronautical purposes, including spatial and temporal variations
  - RVR, including spatial and temporal variations
  - significant weather phenomena (as defined in ICAO Annex 3)
  - cloud amount, height of base, and type, including spatial and temporal variations
  - vertical visibility
  - temperature and humidity
  - atmospheric pressure; determining QFE and QNH
  - supplementary information, wind shear and special weather phenomena.
2. Interpret automatic observed parameters to ensure that observations remain representative of local conditions when differences occur between automatic sensor technologies and manual observing techniques.
3. Ensure that observations are prepared and issued in accordance with ICAO Annex 3, WMO-No.49, regional and national formats, codes and technical regulations on content, representativeness and timeliness.

### **3. ENSURE THE QUALITY OF THE PERFORMANCE OF SYSTEMS AND OF METEOROLOGICAL INFORMATION**

#### **Competency description**

The quality of meteorological observations is maintained at the required level by the application of documented quality management processes.

#### **Performance criteria**

1. Apply the organization's quality management system and procedures.
2. Check and confirm the quality of meteorological observations before issuance, including relevance of content, time of validity and location of phenomena.
3. In accordance with prescribed procedures:
  - identify errors and omissions in meteorological observations
  - correct and report errors and omissions
  - make and disseminate corrections in a timely manner.

### **4. COMMUNICATE METEOROLOGICAL INFORMATION TO INTERNAL AND EXTERNAL USERS**

#### **Competency description**

All meteorological data and information are concise, complete and communicated in a manner that will be clearly understood by the users.

#### **Performance criteria**

1. Ensure that all observations are disseminated through the authorized communication means and channels to designated user groups.
2. Present<sup>2</sup> aeronautical meteorological data and information in a clear and concise manner using suitable terminology.
3. Alert forecasters to observed or imminent significant changes in the weather within the local area.

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<sup>2</sup> Reference may be made to ICAO Annex 1 English language proficiency requirements when English is required to be used as a medium of communication.

## **Background knowledge and skills for the AMO competencies**

The background knowledge and skills listed below underpin the performance criteria for AMOs.

- the key characteristics of the troposphere and tropopause
- properties of air pressure, temperature, density and water vapour
- atmospheric stability, inversions
- the generation mechanisms of wind
- fog and cloud formation and dissipation
- precipitation types and intensities
- the general circulation of the Earth's atmosphere.
  
- the International Standard Atmosphere (ISA)
- the characteristics, occurrence and effects of meteorological hazards to aviation, including low-level cloud ceiling, poor visibility, thunderstorms and associated phenomena, aircraft icing, freezing precipitation, turbulence, tropical cyclones, wind shear and volcanic ash.
  
- interpretation of surface weather maps, satellite and radar imagery
- region-specific weather phenomena, and likely weather sequences that are expected to affect the station
- local topography and climatology.
  
- procedures for performing routine and non-routine aeronautical meteorological observations and reports
- impacts of weather on aircraft and airport operations
- strengths and weaknesses of manual observations and automatic observing systems.
  
- observer directives, procedures and instructions
- validated sources of weather information
- quality management systems
- aviation safety management systems, as required.
  
- standards (as defined in ICAO Annex 3, WMO-No.49) and Quality Management System procedures (as defined in ISO 9001 standards, national regulations):
  - procedures for checking and identifying errors and omissions (in automatically and manually derived data)
  - how to identify significant differences between observational and forecast data
  - when to ignore information and where to go to resolve points of contention
  - desirable accuracies of measurement and observation as in ICAO Annex 3, WMO-No.49 and national regulations
  - priority tasks and time constraints
  - actions to be taken in the event of repeated cases of discrepancies, inconsistencies and malfunctions
  - fall-back procedures in the case of computer failure
  - contingency arrangements in case of emergencies such as fire, bomb alerts and natural disasters.
  
- relevant ICAO and WMO documents, including ICAO Annex 3, WMO-No.49, WMO-No.306, ICAO Manual of Aeronautical Meteorological Practice (Doc8896), and ICAO Manual on Automatic Meteorological Observing Systems at Aerodromes (Doc9837). See Appendix for a list of relevant ICAO and WMO documents.
- ICAO definitions of relevance to meteorology
- WMO Traditional Alphanumeric Codes (TAC) and national aeronautical meteorological codes and forms of data representation.
  
- how weather information is disseminated at the aerodrome
- local aeronautical meteorological telecommunications
- local Air Traffic Services meteorological requirements
- local flight planning meteorological requirements.

### **Regional variations**

- The range of significant weather phenomena.
- Extent of automation of observing and sensing systems.
- Thresholds for significant weather changes.
- Local climatology.
- Extent, scope and exclusions of QMS implementation.
- Regional regulations.
- Communication language(s).
- Available communication technologies.