



Egyptian Air Navigation Circular

EAC

No. 303

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Meteorological Observations at Aerodromes

Chapter 1 Introduction

- 1- Requirements and standards for aerodrome meteorological observations, both within the Egypt as well as the surrounding offshore areas are determined in accordance with the standards and recommended practices (SARPs) of the International Civil Aviation Organization (ICAO) and the guidance issued by the World Meteorological Organization (WMO).
- 2- At licensed aerodromes, the aerodrome licensee is responsible for arranging the provision of aerodrome weather observations and other meteorological information to users.
- 3 - It is recognized that this function may be performed by staff directly employed or contracted by the aerodrome licensee. In order to maintain clarity of responsibilities in respect of meteorological data, the arrangements for the compilation of aerodrome weather reports are described within this document as the responsibility of the Aerodrome Meteorological Observing Service Provider. Within the EGYPT, the Aerodrome Meteorological Observing Service Provider is commonly the air traffic service (ATS) provider organisation. This document recognises, however, that aerodrome weather reports may be produced by any suitably competent and qualified person.
- 4 - At aerodromes with an Air Traffic Control unit, weather reports are provided and utilized in accordance with ICAO PANS ATM Doc 4444, and CAP 493, Manual of Air Traffic Services Part 1. At aerodromes that do not have an ATC unit, the procedures for ensuring that weather reports are made available to pilots and other users should be described locally.
- 5- The requirements contained within this document only apply to licensed aerodromes with instrument runways; however where other aerodromes operate meteorological equipment for the production of a meteorological aerodrome report (METAR), the standards contained within this document, relating to the meteorological equipment in use on the aerodrome will apply. For all other aerodromes, this document should be used as guidance on best practice.
- 6- Aerodrome meteorological observations are used for flight planning purposes and to facilitate safe operation of aircraft in the take off and landing phases of flight. The information includes direction and speed of the surface wind; horizontal visibility; prevailing weather; atmospheric pressure information; surface temperature and dew point; cloud amounts and height of the cloud base.

Equipment used to provide real-time information to ATC is subject to requirements specified in ATS Safety Requirements. If the same equipment is used to originate METAR reports and to provide real-time information to ATS, the sensing and data processing equipment will normally be subject to the requirements of the Egyptian Meteorological Authority (EMA) and the display equipment used within the ATS unit will normally be subject to the relevant requirements of ATS Safety Requirements.
- 7- Accurate, timely and complete aerodrome meteorological observations are necessary to support safe and efficient air navigation.
- 8- The purpose of this document is to describe how ICAO standards and recommended practices are applied in the EGYPT and to specify the requirements for observers and equipment to achieve this.
- 9 - Two types of aerodrome meteorological observations may be provided.

Chapter 2

General Requirements for Aerodrome Observations

- 1- Timely and accurate meteorological information shall be available to aircraft operators and ATS providers. Also, Aerodrome Forecasts (TAF) are provided only on receipt of valid METARs and due account should be taken by aerodrome licensees of operator requirements for these forecasts.
- 2- A METAR shall contain the following items of information:-
 - Identification of the type of report (e.g. METAR)
 - Location indicator
 - Time of Observation, in UTC
 - Surface wind direction and speed (including variations in direction)
 - Visibility*-see note
 - Runway visual range (where applicable and equipment/procedures have been approved)*-see note
 - Present weather*-see note
 - Cloud amount (and type, if applicable) and height of base*-see note
 - Air temperature and dew point temperature
 - QNH and, where applicable QFE
 - Supplementary information (e.g. additional remarks/information from observer, controller or pilot report)

NOTE:

Asterisked elements are included as necessary.
The term CAVOK may replace visibility, present weather and cloud information under certain conditions (see glossary for definition).

- 3- Within the EGYPT, METAR reports shall be provided every 30 minutes during the operational hours of the aerodrome unless otherwise agreed with the Egyptian Meteorological Authority.
- 4- For ATS purposes, the measurements of meteorological elements should be representative of the landing and take-off areas on the runways. For the METAR, the measurement should be representative over the whole aerodrome operating area. Instrumentation used in the measurement of meteorological elements for METAR reports may also be used for reports to ATS providers, providing that the exposure of the instruments is suitable to provide representative readings for both purposes.

NOTE:

Although the content of meteorological reports for ATS purposes and METAR reports are similar, the averaging periods for certain elements in the reports differ. Refer to chapters 4 and 5 for the requirements for each type of report.

- 5 - A method to ensure that observing staff are aware of, and competent in, local observing and reporting procedures shall be established.

NOTE:

Local observing and reporting procedures include the way in which observations are recorded and disseminated both within and beyond the aerodrome, including any necessary backup arrangements.

- 6 - The observer should be provided with a workplace from which a clear view over the whole aerodrome operating area is available either from a window or open area

Chapter 3

Accreditation and Competence of Observers

1- Introduction

- 1.1 The Aerodrome Licensee is responsible for arranging provision of aerodrome weather reports and other meteorological information to users. For the purposes of this document, and to distinguish these responsibilities from other functions that are the responsibility of the Aerodrome Licensee, the responsibilities relating to meteorological information are deemed to be delegated to the Aerodrome Meteorological Observing Service Provider.
- 1.2- The Aerodrome Meteorological Observing Service Provider is responsible for ensuring the competence of each aerodrome meteorological observer employed at the aerodrome. This includes following initial training, during routine observing duties, following changes to observing equipment or METAR coding rules, and following the relocation of an observer from another aerodrome.
- 1.3- The Aerodrome Meteorological Observing Service Provider should ensure that observing staff are sufficiently familiar with all meteorological phenomena that can reasonably be expected to occur at the aerodrome as to permit their competent observation and reporting.
- 1.4- It is recommended that a formal agreement, such as a Service Level Agreement, be reached between the Aerodrome Meteorological Observing Service Provider and the ATS Provider and other agencies to which accurate and timely meteorological information is essential for safe operations.

2- The Meteorological Observer 's Certificate

- 2.1 In order to gain a Meteorological Observer 's Certificate, each aerodrome meteorological observer must successfully complete a recognized course of training on the preparation of aerodrome weather reports and must demonstrate basic competence in compiling such reports.

NOTE:

The Met Office is the only organization that currently offers recognized observer training. A provider wishing to utilize an alternative training organization is advised to consult the Egyptian Meteorological Authority to ascertain the suitability of the training scheme.

- 2.2 The certification process comprises two parts; theory and practical. The theory part will provide the necessary background information on all elements of aerodrome meteorological observing; this is examined to ensure that the concepts have been fully understood.

The practical part puts the aerodrome meteorological observer in the company of an experienced observer in order to enable observing techniques to be practiced and allows the new observer 's basic competence to be assessed.

- 2.3- The theoretical training syllabus is given in Appendix E, Theoretical Practical Observer

Training Requirements; requirements for practical training requirements for observers are given in Appendix F, Practical Observer Training Requirements for a Meteorological Observer 's Certificate (Manual Observed Weather Reports).

- 2.4 Following certification, the trainee observer shall continue to carry out all operational observing duties under supervision until such time that the observer can meet the competency requirements listed in Appendix H, Site Specific Competency Checking of Meteorological Observers.

3- The Restricted Meteorological Observer 's Certificate

- 3.1 Semi-automated observing systems are utilized on many aerodromes for the provision of weather reports. Such systems process data from external sensors located at the aerodrome and compile the basic METAR report incorporating the measurements

- made by the sensors. Elements such as surface wind, temperature and pressure are acceptable as measured by the sensors, without verification by an observer.
- 3.2- Whilst automated sensors can measure visibility, weather type, and cloud height and amount, they are limited by the spatial coverage of the sensor and the capability to resolve present weather types.
 - 3.3 In order to comply with ICAO SARPs, measurements of the surface horizontal visibility, weather type, and cloud details need to be verified by an accredited observer.
 - 3.4 Where a semi-automated observing system is used on an aerodrome, aerodrome meteorological observers need only be competent to provide the visual elements. Reduced training may be provided, concentrating on observing visibility, weather types and cloud details.
 - 3.5 Under these circumstances, following successful completion of the appropriate training course, a restricted met observer's certificate may be awarded. The programme for this training is given in Appendix G, Training Requirements for a Restricted Meteorological Observer's Certificate.
 - 3.6- The provision of backup observing equipment shall take account of the limits of the observers' restricted accreditation..
 - 3.7- Aerodrome Met Observers should note that a restricted met observer's certificate may only be transferred to another aerodrome where a semi-automated observing system is in operation. In these cases, the Aerodrome Meteorological Observing Service Provider should ensure that the observer is provided with sufficient training to ensure that the observer can competently use the primary and backup observing system at the new aerodrome.

4- Continued Accreditation and Refresher Training

- 4.1 The Aerodrome Meteorological Observing Service Provider shall ensure that all accredited aerodrome met observers maintain their observing competence.
- 4.2 If an individual observer has been absent from observing duties for more than ninety days, the observer shall spend an appropriate period of observing under the supervision of another accredited observer, until such time that the observer can meet the competency requirements listed in Appendix H, Site Specific Competency Checking of Meteorological Observers.
- 4.3 Following changes to observing practices or aeronautical codes, the Aerodrome Meteorological Observing Service Provider shall ensure that all staff are aware of the changes, additional training arranged as necessary and that the changes are implemented accordingly.
- 4.4 Optional meteorological observing theoretical and practical refresher training courses are available. These are suitable for observing staff who have not observed for more than a year and for observing staff to acquaint themselves with changes to observing practices and METAR codes. It is also a means by which aerodrome met observers can maintain their observing competence, referred to in paragraph 4.1.
- 4.1. Further information on the courses can be obtained from the Egyptian Meteorological Authority (EMA).
- 4.5 Information on training courses for aerodrome observers is published and updated each year in an Aeronautical Information Circular (AIC).

5- Aerodrome Meteorological Observing Service Provider contingency

The Aerodrome Meteorological Observing Service Provider shall identify contingency and other mitigation measures as agreed between the Licensee and the Provider in case of such events as observer incapacitation or equipment failure.

6- Non-accredited Meteorological Reports

A weather report that has not been validated by an accredited observer may, by agreement with the Egyptian Meteorological Authority (EMA), be distributed locally and to the meteorological forecast office. Such a report will need to be clearly identified as an unofficial report and prefixed as such when being passed to aircraft or other agency.

Chapter 4

METAR Structure and EGYPT Coding Rules

1- Introduction

- 1.1 In the Egypt the standard codes used in composing a METAR report are based on WMO Document No.306,Manual on Codes .The full METAR message may contain up to 18 groups.The Meteorological Authority for each State determines the applicability of codes and practice to that State. The specific coding rules and practice detailed in this chapter are those applicable in the Egypt.
- 1.2 Entries for surface wind (including variations of speed and direction),surface visibility (including directional variation),present weather, cloud details, air temperature, dew point, QNH, QFE and supplementary information are normally completed. The quality of such reports shall conform to ICAO Standards and Recommended Practices (SARPs) as specified in ICAO Annex 3.
- 1.3 Appendix B, Frequently Asked Questions on METAR coding provides additional guidance on the compilation of the METAR.

2- Aviation Weather Report for METARs -Symbolic Code

NOTE:

This is the full METAR coding as given in WMO Document No.306,Manual on Codes,Volume 1,Part A;FM15-X Ext.The EGYPT does not use all of the codes; variations are listed below.

2.1 EGYPT METAR coding variations

- 2.1.1 'AUTO ' indicates that the report has been prepared by an automated observing system, without any human input or supervision. AUTO METARs shall only be disseminated when an aerodrome is closed or, at H24 aerodromes, when the Code name Location Date/time of report Automated Wind velocity/gust Extremes in directionMETAR CCCC YYGGgg Z (AUTO)dddf G f m f m KT d n d n d n V d x d x d x Prevailing visibility MNM visibility/dir 'n Runway Visual Range Present weather VVVV V x V x V x V x D v (R D R D R /V R V R V R V R)(w 'w ')or CA VOKCloud Air temperature and dew point QNH Recent weather Wind shear N s N s N s h s h s h s (CC) (or SKC (or VV h s h s h s TTMTTM / T dTMT dTM Q P H P H P H P H R E wTM TM (WS RWYD R D R) (or WS ALL RWY).

Sea surface temperature Sea state Runway State Trend Remarks
W T s T s S H w D R D R C E t t B B (BECMG
(or (TEMPO (or (NOSIG (RMK)

Chapter 5

Weather Reports to Air Traffic Services

1- Introduction

- 1.1 Weather reports to Air Traffic Services are issued half-hourly (exceptionally hourly) and are used by the ATS unit to provide weather information to pilots at or in the vicinity of the aerodrome. Whilst these reports are very similar to the METAR, there are slight differences in content and coding; these are highlighted below. Further information can also be found in Manual of Air Traffic Services,
- 1.2 During any period that weather reports are being provided to ATS, special reports also shall be produced, if conditions warrant. Unless otherwise agreed by the Egyptian Meteorological Authority (EMA), the criteria for the production of a special report shall be those given in paragraph 11 of this chapter.
- 1.3 By agreement between the Aerodrome Meteorological Observation Service Provider and ATS Provider, the format of weather observations provided to ATS may be varied (e.g. the report may be provided in the METAR code).
- 1.4 Dynamic meteorological information may be provided by ATS units to aircraft for take-off and landing. Equipment used to provide dynamic meteorological information to ATS is subject to requirements specified in ATS Safety Requirements. Equipment used to display dynamic meteorological information within an ATS unit will also be subject to the relevant requirements of ATS Safety Requirements.

2- Surface Wind

- 2.1-The surface wind information provided should be representative of the conditions along the runway. Since, in practice, the surface wind cannot be measured directly on the runway, surface wind observations for take-off and landing should be sited to give the best practicable indication of conditions along the runway, e.g. lift-off and touchdown zones.
- 2.2 In reports to Air Traffic Services, the anemometer reading is averaged over the previous two minutes. The direction from which the surface wind is blowing shall be given in degrees from true North and the speed given in knots.

NOTE:

In reports to aircraft for take-off and landing, direction is to be expressed in degrees Magnetic, and the reading is averaged over the previous 2 minutes; in addition, the extremes in direction and speed (gust and lull) during the past 10 minutes shall be provided. The instantaneous surface wind should be available to give to pilots on request. Further information can be found in ECAR ATS Safety Requirements.

- 2.3 As well as 2-minute mean wind speeds, maximum (gust) and minimum (lull) wind speeds shall be provided when the difference is 10 knots or more from the 2-minute mean wind speed.
- 2.4 Variations in wind direction shall be reported when the total variation in direction over the previous ten-minute period is 60 degrees or more. Variations are reported in clockwise order (e.g. 290V090 or 170V250).
- 2.5 The mean wind direction shall not be included for variable winds when the total variation in direction over the previous ten-minute period is 60 degrees or more or but less than 180 degrees and the wind speed is 3 knots or less; the wind in this case shall be reported as variable; however the two extreme directions between which the wind has varied should be included.

Chapter 6

General Requirements for Observing Equipment

1- Introduction

1.1 Meteorological observing equipment shall provide a timely and accurate source and display of meteorological information to aid in the safe and expeditious flow of civil airtraffic.

1.2 The purpose of this chapter is to provide requirements and recommendations covering all meteorological instruments and systems installed at EGYPT aerodromes.

It covers the performance criteria and safeguarding of meteorological equipment installed at the aerodrome and intended to be used for the origin of aerodrome weather reports.

1.3 The Aerodrome Meteorological Observing Service Provider should ensure that appropriate consideration and provision for service continuity of observing equipment has been made, including any necessary support facilities, such as backup power supply etc.

2- General Requirements

2.1 Equipment installed shall have been designed following design practices as described below and in Chapter 7, Design Requirements for Meteorological Equipment.

2.2 These shall include:

- a) The existence of appropriate technical specifications for the equipment.
- b) Calibration standards traceable to a recognized national or international standard.

2.3 Wherever possible the observing equipment should be designed in such a manner that

- a) the system alerts the user to a failure of part or all of the equipment or power supply.
- or
- b) that such faults should be obvious to the user.

2.4 Equipment shall operate within and recover to the tolerance values specified in each element's requirements from the ranges given for each element in Chapter 7, Design Requirements for Meteorological Equipment.

2.5 The instrument housing shall be designed to prevent atmospheric influences and radiation errors from affecting the parameters measured by the installed sensor(s), whilst allowing a free flow of air across the sensor(s), to enable the sensor to represent the ambient environment.

2.6 Sensors are required to be positioned in such a manner that allows them to measure meteorological elements free of other influences e.g. jet-engine wash.

3- Operation and Maintenance Requirements of Meteorological Equipment

3.1 Equipment should be installed in accordance with the manufacturer's or supplier's instructions and shall be tested to confirm correct and reliable operation.

3.2 The frequency of calibration checks, replacement and servicing intervals shall be specified and based on manufacturers' recommendations, or if operational experience indicates a need, more frequently.

Chapter 7

Design Requirements for Meteorological Equipment

1- Introduction

- 1.1 The purpose of this chapter is to provide minimum standards for meteorological equipment at EGYPT aerodromes producing METAR reports.
- 1.2 The Aerodrome Meteorological Observing Service Provider should ensure that appropriate consideration and provision for service continuity of observing equipment has been made, including any necessary support facilities, such as backup power supply etc.
- 1.3 If backup sensors are available, the procedures for use, operational limitations and maximum period of use must be documented by the Aerodrome Meteorological Observing Service Provider.
- 1.4 Sensor siting shall not encroach the obstacle limitation surface or obstacle free zones. However, consideration may be given by the Safety Regulation Group to the collocation of sensors on existing structures on the aerodrome.
- 1.5 Notwithstanding the constraints listed in paragraph 1.4, the exposure of the sensor should minimise the effects of all obstructions. The tower used to mount the wind sensor is not considered an obstruction to the sensor collection system but, with the exception of the temperature, dew point, and pressure sensors, it should be at least 3 metres away from all other meteorological sensors. Sensors should be located as far as practicable from any source likely to significantly affect the quality of the data.
- 1.6 The display shall present a clear and unambiguous indication of the operational status of the sensor system to the user, in a format applicable to the proposed installation.
- 1.7 Where possible, the equipment should be self-monitoring and provide a suitable indication of equipment status and serviceability.
- 1.8 Where equipment is not self-monitoring, a failure of the equipment should be obvious.

2- Requirements for Meteorological Displays

2.1 Performance

- 2.1.1- Meteorological displays that present dynamic meteorological information to ATS is subject to the requirements contained in ECAR ATS Safety Requirements.
- 2.1.2 Where separate display systems are used to source data for the preparation of METAR reports and for the presentation of dynamic meteorological information to ATS, the display device for the METAR shall be designed in such a way as to draw the attention of the operator to significant changes in the displayed meteorological information. (A significant change is defined in Chapter 5, Weather Reports to Air Traffic Services)
- 2.1.3 The wind sensor display shall indicate whether the direction is referenced to True North or Magnetic North.
- 2.1.4 On aerodromes with more than one wind sensor, the display shall clearly indicate the sensor or location from which the information is derived.

Chapter 8

Dissemination of Weather Reports

1- Introduction

1.1 Meteorological reports should be disseminated beyond the aerodrome in a manner agreed between the ATS Provider and the Egyptian Meteorological Authority (EMA).

NOTE:

This is normally achieved by the transmission of routine reports to the EGYPT Civil Aviation Communications Centre by the Aeronautical Fixed Service.

1.2 ECAR Manual of Air Traffic Services describes the elements of a meteorological report that are routinely required to be passed to pilots by ATC.

NOTE:

Where the passing of meteorological information increases ATC workload to the extent that the provision of the ATC service is affected, the Provider of ATC should consider the broadcast of meteorological reports on ATIS.

1.3 Meteorological reports included on ATIS is an ATS function and is covered in full detail in ECAR Manual of Air Traffic Services and ECAR ATS Safety Requirements

2- Timing Requirements

2.1 In the EGYPT, METARs are transmitted every half hour or exceptionally every hour. Typically observations are made at 20 minutes past the hour (where half-hourly observations are provided) and at 10 minutes to the hour (for both half-hourly and hourly observations).

Since aerodromes have pre-determined designated places in meteorological bulletins and on VOLMET etc., it is essential that observations are completed in accordance with normal observing practice and are transmitted within 5 minutes of normal dispatch time.

2.2 The Meteorological Forecast Office also requires timely observations to ensure that amendments to Aerodrome Forecasts are issued quickly, and to assist in the timely issue of aerodrome warnings.

3- METAR

3.1 Once a METAR has been transmitted it will be collected at the Civil Aviation Communications Centre and assembled into pre-determined 'bulletins'. The bulletins are then disseminated via Aeronautical Fixed Service (AFS) channels. Selections of the AFS data will be available on the Aeronautical Fixed Telecommunications Network (AFTN) or via the Satellite Distribution System (SADIS), as agreed between the Egyptian Meteorological Authority (EMA), the EGYPT Civil Aviation Communications Centre and ICAO Regional Planning Groups.

3.2 A small selection of METARs is sent for broadcast on VOLMET. VOLMET is a voice broadcast of a set of METARs broadcast on four frequencies covering different regions of the EGYPT with each frequency transmitting a different METAR set. The one region is Cairo VOLMET (Main).

3.3 Many METARs and TAFs are grouped together into regions and available to telephone callers on DIALMET.

Full details are specified in the EGYPT AIP.

A selection of METARs and TAFs are also available via fax and Internet services.

Chapter 9

Reliability and Availability of Reporting

1 - Accredited Meteorological Aerodrome Reports

METAR reports shall be completed by an accredited observer. Procedures shall be in place to ensure that any observation generated by an automated weather observing system is not disseminated outside of the periods defined in Chapter 4 paragraph 2.1.1, unless it has been checked and qualified by an accredited observer.

2 - Completeness of Reports

2.1 The purpose of a weather observation is to provide a complete picture of the conditions at the aerodrome to a variety of recipients.

2.2 The meteorological forecaster is required to take account of all meteorological variables when preparing an Aerodrome Forecast; METARs are used to verify base conditions before forecasting how these elements will change with time. Missing information in the METAR may lead to greater inaccuracies in the forecast which may impact on tactical planning by pilots, operators and other aerodrome service providers.

3- Missing Meteorological Aerodrome Reports

3.1 If the routine supply of METARs ceases, for whatever reason, there may be an impact on users of the meteorological information (e.g. selection of alternate aerodromes and fuel upload planning) and the provision of an Air Traffic Service.

Wherever practical, suitable contingency measures shall be identified and associated operational procedures documented.

3.2 In accordance with ICAO Annex 3, if a regular supply of METARs ceases or is incomplete, the Aerodrome Forecast may be cancelled, as the meteorological forecaster loses the site-specific information on which to confirm the forecast. The forecaster will not issue further Aerodrome Forecasts until the transmission of METARs re-commences.

4 – Timeliness

4.1 The Aerodrome Meteorological Observing Service Provider shall allocate sufficient time resources to the aerodrome meteorological observing staff to enable them to carry out observing duties. The observer may need to assess certain elements of the weather from an outside observing position that is close to ground level. All reports should be checked before issue.

4.2 Data collection for observations made at 20 minutes past the hour (where half-hourly observations are provided) must begin no earlier than 10 minutes past the hour. Data collection for observations made at 10 minutes to the hour (for both half-hourly and hourly observations) must begin no earlier than 20 minutes to the hour.

4.3 METAR reports made at 20 minutes past the hour (where half-hourly observations are provided) shall be completed by 25 minutes past the hour and METAR reports made at 10 minutes to the hour (for both half-hourly and hourly observations) shall be completed by 5 minutes to the hour.

4.4 Specials reports,when applicable,should be made without delay and recorded in the appropriate manner.

Chapter 10

Records and Archives

1- Introduction

- 1.1 A continuous log shall be maintained of all METAR and special reports produced at the aerodrome. These data may be required in the event of an official enquiry relating to an aircraft accident or incident either at,or in the vicinity of the aerodrome and can be useful for planning future aerodrome services.
- 1.2 When the observations are made using a semi-automated observing system, the system should be arranged either so that a printout of the METAR and special reports is made for retention, or so that the METAR and special reports are stored on a disk, which can be retained for future reference.
- 1.3 For manual observations,a record shall be maintained to log all the readings and reports.
- 1.4 In the event of a mistake being discovered in the METAR report,a corrected METAR shall be issued. Following an erroneous log entry, the original value and corrected value shall be clearly indicated, especially when a report has been used by the Air Traffic Service Provider or coded in the METAR. An original erroneous figure must not be deleted and replaced at a later time with a corrected figure.Thus the log will show both the original erroneous report and the subsequent correction with the time at which the correction was made.

NOTE:

A corrected METAR shall only be issued ahead of the subsequent METAR, typically 30 minutes later. Thereafter, any mistake should be logged only.

2- Meteorological Information Records

- 2.1 Where observing systems are in use ,the equipment shall be capable of producing printed record of all observation reports (METAR, special reports and any non-routine observation at the time of an aircraft accident on or in the vicinity of the aerodrome) produced during the preceding 30 days. Where manual observations are produced, each instrument reading should be recorded in a book or other suitable log, in accordance with World Meteorological Organization guidance material, and retained for a period of at least 30 days. Similarly where continuous analogue recordings are made of meteorological elements,any charts or other recordings should be retained for at least 30 days.

NOTE 1:

Air Traffic Control units should examine the requirements for producing a printed post-incident meteorological report given in ECAR Manual of Air Traffic Services.

NOTE 2:

METAR and TAF reports distributed via the AFS are stored by the EGYPT Met Office for a minimum of one year.Such data may be accessed on request. The EGYPT Met Office may make a charge for this service.

- 2.2 Where observing systems sample conditions more frequently than is required for the production of routine or special reports,it is recommended that a facility exists for the system to store the previous 60 minutes of data from each sensor,on command from the observer (for example following the completion of a non-routine observation). Data should be retained for a period of at least 30 days.

2.3 All records and data should be available for examination by the CAA or the EGYPT Air Accidents Investigation Branch (AAIB) on request. The aerodrome shall agree that any

Chapter 11

Definitions, Abbreviations and Bibliography

1- Glossary of Definitions and Abbreviations

This Glossary contains terms that have a specific meaning in civil aviation, safety, or regulatory matters.

2- Definitions

Accuracy The stated value of required accuracy represents the uncertainty of the reported value with respect to the true value and indicates the interval in which the true value shall lie.

Aerodrome Any area of land or water designed, equipped, set apart or commonly used for affording facilities for the landing and departure of aircraft.

Aerodrome Meteorological Observing Units

A unit on an aerodrome that produces METAR observations or is responsible for the receipt (and onward transmission around the aerodrome, where appropriate) of aerodrome meteorological warnings

Aeronautical Fixed Service A telecommunication service between specified fixed points provided primarily for the safety of air navigation and for the regular, efficient and economical operation of air services. (ICAO Annex 11, Chapter 1)

Aeronautical Fixed Telecommunication Network

A worldwide system of aeronautical fixed circuits provided as part of the aeronautical fixed service, for the exchange of messages and/or digital data between aeronautical fixed stations having the same or compatible communications characteristics. (ICAO Annex 11, Chapter 1)

Aeronautical Information Service (AIS) Publisher of Notices to Airmen (NOTAM) and Egypt Aeronautical Information Package.

Aerodrome Licensee In relation to any aerodrome, the person in charge of the aerodrome.

Air Traffic All aircraft in flight or operating on the manoeuvring area of an aerodrome. (ICAO Annex 11, Chapter 1)

Air Traffic Control Centre An air traffic control unit established to provide an area control service to aircraft flying within a notified flight information region which are not receiving an aerodrome control service or an approach control service. (ECAR Air Navigation: The Order and the Regulations)

Air Traffic Control Unit A person appointed by the CAA or by any other person maintaining an aerodrome or place to give instructions or advice

or both instructions and advice by means of radio signals to aircraft in the interests of safety but does not include a person so appointed solely to give information to aircraft, and 'Air Traffic Control Service' shall be construed accordingly. (ECAR Air Navigation: The Order and the Regulations) **Air Traffic Service** A generic term meaning air traffic control service, flight information service and air-ground communication.

Appendix A

Purpose of the Aerodrome Meteorological Liaison Visits

1- Introduction

- 1.1 In order to comply with ICAO SARPs, the EGYPT Meteorological Authority arranges for aerodrome meteorological observing units to be visited at regular intervals. The aim of these visits is to ensure that a high standard of observations is maintained, instruments and their displays are functioning correctly and to check the exposure of instruments.
- 1.2 The Egyptian Meteorological Authority (EMA) requires annual liaison visits for all aerodromes that produce and disseminate METARs. These are listed in the EGYPT AIP (GEN table 3.5.3.2.). Aerodromes that are provided with a meteorological warnings service are visited every three years. The visit will check local meteorological procedures and inspect the standard of weather reports, instrumentation and, if applicable, meteorological flight briefing documentation provided. The inspector may also offer help and advice regarding the provision of meteorological services to both the airport management, observers and users.
- 1.3 The liaison visit may be used to send completed Register of Observations (Metform 2612) to the Public Record archive and to request new Registers.

NOTE:

The Met Office will supply Registers of Observations (Metform 2612) free of charge, on the basis that upon completion, these registers may be archived by the Met Office. Archived data and registers may be used in generating climatological data, as noted in the EGYPT AIP (GEN table 3.5.3.2).

2 Conduct of Liaison Visit

- 2.1 Meteorological instrumentation will be checked during the visit. The exposure and accuracy of the instrumentation will be looked at, as well as procedures for use of the instrumentation.
- 2.2 The regularity of METAR observations will be checked prior to the visit and any issues raised on the day.
- 2.3 Time during the visit will also be made for possible meetings with users of meteorological information on the aerodrome, e.g. airlines, flying clubs, handling agents, to discuss the meteorological services provided for their operations. A summary of the discussions will be included in the report.
- 2.4 The aerodrome entry in EGYPT AIP GEN table 3.5.3.2, AD 2.11 and any weather-related warnings contained within AD 2.20 will be reviewed during the visit and details of any amendments taken.

2.5 Following the visit, a copy of the report shall be sent to the Manager of the Aerodrome Meteorological Observing Service Provider.

Appendix B

Frequently Asked Questions on the Compilation of the METAR

1- Introduction

There are a number of common queries that are often raised when completing the METAR. Full details can be found in the earlier sections of Chapter 6 but the most frequently asked questions are given below to assist the observer.

2- Questions

2.1 Wind

- Which anemometer is used for the METAR report?

2.1.1 Whatever runway is in use, the wind velocity for the METAR is normally taken from one designated anemometer, and usually is averaged over 10 minutes. It may include a gust speed recorded in that 10 minute period when appropriate.

- How is the wind direction reported and when is a variation group included?

2.1.2 Wind direction shall be recorded in degrees true, and shall include a variation group, if, during the previous 10 minutes the direction has varied through an arc of 60 degrees or more but less than 180 degrees and the mean speed during the previous 10 minutes is more than 3 knots.

2.2 Visibility

- What visibility is reported in the METAR?

2.2.1 In the METAR, the prevailing visibility shall be reported. If the visibility in one direction, which is not the prevailing visibility, is less than 1500 metres or less than 50% of the prevailing visibility, the lowest visibility observed shall also be reported and its general direction in relation to the aerodrome indicated by reference to one of the eight points of the compass. If the lowest visibility is observed in more than one direction, then the most operationally significant direction should be reported. When the visibility is fluctuating rapidly and the prevailing visibility cannot be determined, only the lowest visibility should be reported, with no indication of direction.

2.3 Present weather

- When is mist reported?

2.3.1 Mist, dust (widespread), smoke and haze shall be reported only when the visibility is 5000 metres or less.

- How often does heavy rain occur on average?

2.3.2 Care should be taken to avoid over-estimating the intensity of precipitation. Statistically, in the Egypt, light rain falls on 80% of occasions and heavy rain falls on less than 5% of occasions.

- When should separate weather groups be reported?

2.3.3 Although up to three weather types may be reported, they should be occurring independently; e.g. a mist or fog group shall not be inserted if the reduction in visibility is due wholly to falling precipitation.

- How is 10 kilometres visibility and broken cloud at 5500 feet reported?

2.3.4 CAVOK should be used in this instance.

Appendix C

Human Observed RVR Calibration

- 1- The Egyptian Meteorological Authority(EMA) is responsible for arranging Human Observed Runway Visual Range Calibration.
- 2 -Each aerodrome is re-calibrated once every 3 years or following any changes to the runway lighting system
- 3 -The calibration establishes the relationship between the apparent brightness of the runway lights seen by the pilot on the centre-line of the runway at the touchdown point with the apparent brightness of the runway lights seen from the Runway Observation Point (ROP), which is sited, where possible, opposite the touchdown point.
- 4- The measuring instrument used to obtain this relationship is the Gold Visibility Meter (GVM).
This comprises an infinitely variable density filter through which a given runway edge light can be seen. Each light is viewed through the GVM from the ROP at the observer's normal eye height and then from the runway centre line abeam the RVR observation point at the height of approximately 5 metres. At both locations the filter is adjusted so that the light is just extinguished. By application of a formula to the readings of the Gold meter when the light is just extinguished at the two points, a table converting the number of lights visible from the RVR observation point to the RVR to be reported can be computed.
- 5- The calibration is done during the hours of darkness in good visibility (4000 metres or more).
The calibration personnel should meet the same vision criteria as the RVR observers.

Appendix D

Daily Atmospheric Pressure Equipment QNH Check

- 1- Atmospheric pressure measuring equipment shall be checked daily for signs of sensor drift by comparison with other pressure instrumentation on the aerodrome. However, the check should not take place if the mean wind speed exceeds 25kts, or when the pressure change is greater than 1 hpa per hour, as this may adversely affect the comparison.
- 2- The Aerodrome QNH (to the nearest tenth of a hpa) should be used in the comparison.
- 3- The use of the table below to record the daily pressure check may indicate sensor calibration drift before the sensor reaches the limits of allowed accuracy. However, if differences consistently reach 0.5mb then calibration of the barometer should be brought forward.

Date Primary
Sensor
Backup

Sensor Date Primary
Sensor
Backup
Sensor

Appendix E

Theoretical Observer Training Requirements

1- Introduction

- 1.1 The objective of the theoretical training is to provide tuition in the skills required to accurately and reliably produce weather reports to ATS and to issue reports in the METAR format.
- 1.2 The theoretical training is intended to be classroom based. On successful completion of the theoretical training, the trainee will be eligible to go forward for practical observer training session and, on suitable completion of this, will be awarded an ameteorological observing certificate.

2 Training Programme

- 2.1 The purpose of the theoretical training is to instruct the trainee observers on observing techniques and how to correctly encode and decode weather reports. The trainee will also be given instruction on how to carry out simple care and maintenance of instruments.
- 2.2 Details of approved training courses are specified annually in an AIC.

3- Training Syllabus

3.1 The training shall provide instruction on the following:

- a) The process of compiling and preparing weather reports, especially using the METAR code.
- b) The reporting of the surface wind measurements, including backup facilities.
- c) The observing and reporting of visibility by day and by night.
- d) Runway visual range (RVR)-familiarisation with the code and when to report.
- e) The observing and reporting of "present weather" in its various forms, including the relationship between humidity and reporting of Mist/Haze.
- f) The observing and reporting of cloud base and height, including when to report CAVOK, SKY CLEAR and sky obscured. Identification of convective clouds and their reporting in the METAR code.
- g) The reporting of temperature and determination of dew point values, especially the attention and care required when reporting sub-zero temperatures.
- h) The observation of atmospheric pressure and the reporting of QNH and QFE.
- i) Runway State -familiarisation with the code and when to report.
- j) When and how to report "Recent Weather".

- k) The criteria and process for issuing special weather reports.
- l) Familiarisation with OPMET bulletins containing METAR reports.
- m) Interpretation of standard weather charts to self-brief on the prevailing weather.

Appendix F

Practical Observer Training Requirements for a Meteorological Observer 's Certificate (Manual Observed Weather Reports)

1- Introduction

- 1.1 The purpose of the practical training is to apply the theoretical knowledge gained in the context of an operational environment and to enable the practical competence of the observer to be assessed.
- 1.2 The practical training will concentrate on the correct application of meteorological observing techniques, use of a range of meteorological instrumentation including, but not limited to, semi-automated observing systems.
- 1.3 Whenever possible, practical training should follow immediately after the theory training. This will allow the student to maximise the gain confidence in using and instrumentation, as well as allowing an assessment of the observing competence of the student to be carried out.
- 1.4 It is recommended that the formal practical observer training should last between 4 days and 2 weeks.

2 -Training Organisations

- 2.1 The training programme, examinations and competency of aerodrome meteorological observers shall be approved by the Egyptian Meteorological Authority (EMA). This is to ensure that the standard of observing training is uniform for all students. Details of the approval process are available from the Egyptian Meteorological Authority on request.
- 2.2 Practical training shall be supplied by suitably experienced observers, having at least 5 consecutive years experience of aviation meteorological observing. Ideally the experience will have been gained from working at more than one aerodrome and also have included experience of producing both fully manual observations and observations assisted by automated meteorological weather observing systems. Thus observers providing practical training will have a wide perspective on different observing methodologies used in the EGYPT.
- 2.3 A training supervisor (who may also be one of the observing staff discussed in Appendix G paragraph .
- 2.2) should be assigned to the student to ensure that all aspects of the training programme are covered and to act as a mentor for the student. The training supervisor will also have at least 5 consecutive years experience of aviation meteorological observing and preferably some experience of synoptic weather observing. The examination and/or report may be delegated to another member of the observing staff, if required.

2.4 Copies of the following publications should be held at the observing office for the use of trainees during training:

- Metform ---- Cloud Types For Observers
- Metform ---- Meteorological Observing Codes For Use In METARs
- Metform ---- METAR Register Of Observations, or equivalent form for manually recording observations.

Annex A to Appendix F

Observing competencies to be assessed during the Practical Simulations:

Elements Tasks The assessment will *check that you can*:

Comments Signed Cloud Recognise and name cloud types relevant to METAR reports. Correctly identify all cloud types observed relevant to METARs. (See note)

Estimate cloud amount, total and layers.

Accurately estimate cloud amount in each layer ± 1

okta. Estimate cloud heights. Accurately estimate cloud height $\pm 30\%$ if not using the LCBR. Encode cloud data. Correctly encode cloud data in the METAR register.

Visibility Estimate the visibility. Accurately estimate visibility using visibility points $\pm 20\%$. Encode visibility data. Correctly encode visibility data in the METAR register

Temperature Read the various types of thermometers available. Accurately read all types of thermometers to ± 0.1 °C. Encode temperature data. Correctly encode temperature data in the METAR register.

Wind Estimate mean wind speed and direction.

Estimate wind speed to the nearest force on the

Beaufort scale and estimate wind direction using 16 point compass, ± 1 compass point.

Assess mean and gust wind speeds and direction from wind display systems including significant

variations. Correctly obtain mean and extreme values from wind dials. Encode wind data. Correctly encode wind data in the METAR register

Appendix G

Training Requirements for a Restricted Meteorological Observer 's Certificate

1- Introduction

- 1.1 The training aims to provide tuition in the theory and practical skills required to make semi-automated weather reports to the standard necessary to ensure the safety of aircraft. On completion the trainee is awarded a restricted meteorological observing certificate. The certificate will only apply to observing duties where the Aerodrome Meteorological Observing Service Provider uses approved semi-automated systems.
- 1.2 Weather reports to ATS may be compiled using an approved semi-automated observing system but the dissemination of a METAR requires validation of the visual elements (visibility, present weather and cloud) before transmission.

2 -Training Programme

- 2.1 Training shall be carried out to enable the observer to visually evaluate the visibility, present weather, cloud amounts, height of cloud bases, and presence of significant convective clouds. This will allow either these parameters to be added to the weather report, or if sensors are available on the semi-automated system for recording these that they are validated before the weather report is disseminated.
- 2.2 It is expected that the training shall be conducted at the parent ATS unit. The theory training should last two days followed by supervised on the job training.
- 2.3 Aerodrome weather reports may be compiled using an approved semi-automated observing system. This allows the non-visual elements to be generated from sensor measurements, and the visual elements to be assessed by a qualified observer. Training is necessary to enable the observer to visually evaluate the visibility, present weather, cloud amounts/bases, and presence of significant convective clouds (TCU and CB) so that the sensor readings can be qualified.
- 2.4 The observer should be aware of the operational requirements for METAR reports at the aerodrome. At aerodromes where TRENDS are attached to the METAR reports, the observer should understand the procedures for obtaining the TREND message from the meteorological forecasting office.
- 2.5 The observer should understand the different requirements between weather reports provided for ATS and those disseminated beyond an aerodrome, in particular the METAR.
- 2.6 The observer should be able to interpret the self-briefing weather documentation available on an aerodrome.

3 Training Syllabus

- 3.1 The syllabus should cover the following aspects, in line with the requirements specified above:
- a) The METAR and introduction to ICAO Annex 3 Chapter 4.
 - b) The purpose of the METAR to flight operations and forecasting.
 - c) Differing requirements for surface wind reports ATC/METAR.

Appendix H

Site Specific Competency Checking of Observers

- 1- A trainee observer who has gained a basic certificate of competence on an observer training course shall also complete further practical experience of observing under supervision at the parent ATS unit.
- 2- The observer shall be required to demonstrate competence in all aspects of meteorological observing under normal working conditions.
- 3- Table 8 shows the minimum core competencies that an observer shall be required to demonstrate and a sample format that may be used to record their performance.
- 4- Table 9 shows an example of a work sheet that may be used during the supervision period to record progress on competency checking.
- 5- The formats of tables 8 and 9 may be varied to reflect differences in the prevailing conditions at aerodromes. A record should be made when an observer experiences, records and codes rare weather events such as thunderstorms or fog.
- 6- The formats of tables 8 and 9 may also be used to record observers' performance in ongoing competency checks or refresher training programmes that are developed for all or individual members of observing staff.
- 7 -Certificated observers should carry out a minimum of ten observations over a consecutive period of ninety days to maintain observing and METAR coding skills; ideally one of these observations should be during conditions when the visibility is less than 5 kilometers, one should be during a precipitation event and one should be during 'CAVOK' conditions.. Where observers do not meet the minimum requirements, the Manager, or other nominated person, of the Aerodrome Met Observing Service Provider should ensure that the observer can demonstrate observing and METAR coding competence before resuming operational observing duties.
- 8- Every accredited observer should be assessed on an annual basis by the Manager, or other nominated person, of the Aerodrome Met Observing Service Provider to ensure the observer's ongoing competence.
- 9- Observers' continued competence may also benefit from one or more of the following:
 - a) The Manager, or other nominated person, of the Aerodrome Met Observing Service Provider, who assesses observer competence should periodically attend a met refresher training course to ensure that they are up to date on the latest coding requirements and observing techniques.
 - b) The Aerodrome Met Observing Service Provider arranges for periodic met refresher training for all staff.

- c) Aerodrome Met Observing Service Provider staff attend a met refresher training course, on a rolling basis. As a guide, staff should attend at least once every five years.
- d) The Aerodrome Met Observing Service Provider arranges for an On Site Competency Assessment of Observers by a CAA-approved assessor.