

# KURDISTAN REGIONAL GOVERNMENT



## **SULAYMANIYAH INTERNATIONAL AIRPORT**

**MATS**

### **CHAPTER 9**

**ALTIMETRY AND METEOROLOGY**  
( First Edition )

**April 2012**

**Prepared By**  
**Fakhir .F. Mohammed**  
**Civil Aviation Consultant**

**TABLE OF CONTENTS**

\*\*\*\*\*

<b>Subjects</b>	<b>Page</b>
-----	-----
<b>9.1 Altimetry and meteorological procedures .....</b>	<b>9 - 1</b>
<b>9.1.1 Altimeter settings .....</b>	<b>9 - 1</b>
<b>9.2 Transition Level and Transition Altitude .....</b>	<b>9 - 2</b>
<b>9.3 Procedures for Air Traffic Services .....</b>	<b>9 - 3</b>
<b>9.3.1 General .....</b>	<b>9 - 3</b>
<b>9.3.2 Coordination .....</b>	<b>9 - 3</b>
<b>9.3.3 Meteorology briefing .....</b>	<b>9 - 3</b>
<b>9.3.4 Provision of weather information .....</b>	<b>9 - 4</b>
<b>to ATS Units</b>	
<b>9.3.5 Aerodrome and Approach Control .....</b>	<b>9 - 4</b>

\*\*\*\*\*

\*\*\*\*\*

\*\*\*

## CHAPTER 9

# ALTIMETRY AND METEOROLOGY

\*\*\*\*\*

## 9.1 ALTIMETRY AND METEOROLOGICAL PROCEDURES

### 9.1.1 ALTIMETER SETTINGS

#### 9.1.1.1 Application

9.1.1.1.1 The Altimeter Setting Procedures listed in this chapter are in general use at ATS Units. Some divergence from these procedures may occur when specifically required by ICAO Regional Supplementary Procedures or by Local Regulations.

#### 9.1.1.2. Altimeter Settings

9.1.1.2.1 Three different types of altimeter setting are in general use. They are as follows:-

a. QNH.

b. QFE.

c. Standard Altimeter Setting 1013.2 hpa ( 29.92 inch).

9.1.1.2.2 Each setting will result in an altimeter indication which provides a measure of the vertical distance above the particular reference datum. In every instance below the term “ Altimeter Indication ” means the reading obtained from an instrument, bearing in mind that this indication is seldom, if ever, the true vertical distance.

<b>Altimeter Setting</b> *****	<b>Reference Datum</b> *****	<b>Altimeter Indications</b> *****
<b>QNH</b>	<b>Mean Sea Level</b>	<b>Altitude</b>
<b>QFE</b>	<b>QFE reference point</b>	<b>Height above QFE reference point</b>
<b>Standard Altimeter Setting</b>	<b>1013.2 hPa 29.92 Inch</b>	<b>Vertical position in terms of FLIGHT LEVEL.</b>

**9.1.1.2.3** Altimeter settings provided to aircraft for approach, landing or take-off shall be rounded **DOWN** to the nearest whole hpa., they will however be given to the nearest tenth of a hpa. if requested by the pilot.

**9.1.1.2.4** Vertical displacement of aircraft shall be expressed as:-

- a. ALTITUDE, when AT or BELOW the Transition Altitude.**
- b. FLIGHT LEVEL, when AT or ABOVE the Transition Level.**
- c. ALTITUDE while descending and FLIGHT LEVEL while climbing through the Transition Layer.**

*Note. Aircraft shall not maintain level while flying through the transition layer unless otherwise instructed by ATC.*

## **9.2 Transition Level and Transition Altitude**

**9.2.1** The Transition Level and Transition Altitude for Sulaymaniyah International Airport are :

- a. Transition Level : FL160**
- b. Transition Altitude : 14000 Ft**

### **9.3 Procedures for Air Traffic Services**

#### **9.3.1. General**

**9.3.1.1 Meteorological information is provided to ATS units by the appropriate Meteorological Office. The Iraqi AIP sets out in detail the methods employed by the Meteorological Office in collection and dissemination of information. Controllers should study this section of the AIP and other Meteorological Office publications in order to have a better appreciation of the organization and its operation.**

#### **9.3.2 Coordination**

**9.3.2.1 It is essential at all times that the closest coordination is maintained between ATS units and Meteorological Offices in order that the best possible weather service is provided. Controllers can materially assist by keeping a close watch on the weather and by obtaining weather observations from aircraft when requested. Information obtained from pilots, or any sudden and unexpected deterioration observed by controllers should be reported to the Meteorological Office without delay.**

#### **9.3.3. Meteorology Briefing**

**9.3.3.1 Before taking over watch, controllers shall study the weather conditions in the area related to their duties for the period of the watch. This can be done either by:-**

- a. self-briefing by study of the information supplied by the Meteorological Office on a routine basis or,**
- b. a visit to the Meteorological Office for a personal briefing. At units where this is impracticable, controllers may obtain their briefing by telephone.**

**9.3.3.2 At aerodromes, controllers will need an overall appreciation of the meteorological situation and actual and forecast conditions for:-**

- a. local and adjacent areas,
- b. main routes with which they are concerned,
- c. diversion aerodromes if these are likely to be required.

### **9.3.4. Provision of Weather Information to ATS Units**

**9.3.4.1 Meteorological information shall be provided to the ATS unit by means of teletype messages.**

**9.3.4.2 In the event of a breakdown of the delivery system, information shall be passed by telephone and recorded by controllers. This information shall be read back and initials exchanged.**

**9.3.4.3 Amendments to information already given will normally be made by issuing a new METAR. Should the amendment be of an urgent nature it may be passed by telephone and followed immediately by written confirmation.**

### **9.3.5. Aerodrome and Approach Control**

**9.3.5.1 A Meteorological Office shall provide the following information to Aerodrome Control Tower and Approach Control Unit :-**

- a. **Meteorological Reports (METAR) for the aerodrome shall be issued on half-hourly bases , in the following format:-**
  - i) **Surface wind-direction and speed (direction in degrees magnetic & speed in Knots).**
  - ii) **Maximum speed of wind gusts ( in Knots).**
  - iii) **Present weather**
  - iv) **Horizontal visibility.**
  - v) **Cloud - (as per ICAO designators) – giving bases and any CB or TCU (Towering Cumulus).**
  - vi) **Surface temperatures and dew point .**
  - vii) **Station QNH.**
  - viii) **QFE ( for thresholds of Runway 31 and Runway 13)**
  - ix) **TREND.**

*Note 1. If the METAR has not been received when expected, the controller shall request the information from the Meteorological Department .*

*Note 2. QFE threshold value shall be **ROUNDED DOWN** by the controller to the **NEAREST WHOLE** hpa and pass it to the pilot on request.*

*Note 3. The use of the words ( cloud base )or ( base ) in meteorological reports and aerodrome forecasts means the height of the base of any cloud above aerodrome elevation.*

**b. Cloud amount shall be reported in the following format:-**

<i>FEW</i>	<i>1 to 2 OKTAS</i>
<i>SCT (Scattered)</i>	<i>3 to 4 OKTAS</i>
<i>BKN ( Broken)</i>	<i>5 to 7 OKTAS</i>
<i>OVC (Overcast)</i>	<i>8 OKTAS</i>
<i>SKC(Sky Clear)</i>	<i>No cloud, no restriction on vertical visibility and CAVOK inappropriate.</i>

**c. Meteorological reports (SPECI) for the aerodrome shall be issued whenever the weather deteriorates or improves .**

**9.3.5.2 Forecasts of meteorological conditions in the vicinity of the aerodrome shall be issued at regular intervals as necessary, normally every 6 hours.**

**9.3.5.3 A selection of the following warnings for the protection of parked aircraft shall be passed by the Meteorological Department as required:-**

**a. Gales.**

**b. Squalls.**

**c. Thunderstorms.**

**d. Sandstorms.**

**e. Duststorms.**

**f. Rising Sand and Dust.**

**g. Hail.**

*Note:- Expected occurrence of fog in the vicinity of the aerodrome shall also be reported.*

**9.3.5.4 For a Precision Approach, the QFE passed to the pilot shall be for the RUNWAY THRESHOLD ELEVATION.**

*Note. Precision Approach is an instrument approach utilizing Azimuth and Glide Path information provided by ILS, MLS or PAR.*

**9.3.5.5 IFR flights shall not be assigned a level which is below the Minimum Flight Altitude Established by the appropriate ATS authority or below the Lowest Useable Flight Level.**

*Note 1. The Lowest Useable Flight Level is that flight level which corresponds to , or is immediately above, the Established Minimum Flight Altitude.*

*Note 2. The objectives of Air Traffic Control Service as prescribed in Annex 11 do not include prevention of collision with terrain. The procedures prescribed in Annex 11 and this manual do not therefore relieve the pilots of their responsibility to ensure that any clearance issued by Air Traffic Control Units is safe in this respect, except when an IFR flight is vectored by RADAR. ( see Doc 4444, Note 3 of 4.10.3.2, see also chapter 5 Item 5.1.2 of this manual)*

**9.3.5.6 A QNH altimeter setting shall be included in the descent clearance when first cleared to an altitude below the Transition Level, in approach clearances or clearances to enter the traffic circuit, and in taxi clearances for departing aircraft except when it is known that the aircraft has already received the information.**

**9.3.5.7 Altimeter settings provided to aircraft shall be ROUNDED DOWN to the nearest whole hectopascal.**



### 9.3.5.8 Checking of Information

**9.3.5.8.1** Weather reports received by a controller from the Meteorological Office shall be checked by observation and comparison with previous reports with particular emphasis on barometric pressures. Should there be an apparent error the point at issue shall be confirmed with the Meteorological Office before transmission to aircraft.

### 9.3.5.9 TRANSMISSION OF METEOROLOGICAL INFORMATION TO AIRCRAFT

**9.3.5.9.1** As a rule a controller shall only pass to aircraft meteorological information that has been issued or agreed by the Meteorological Office. Exceptions to this rule are:-

- a. When a controller observes a sudden or unexpected deterioration and considers it advisable in the interests of safety to warn aircraft immediately and consult the Meteorological Office afterwards.
- b. Information from an aircraft landed or from an aircraft in flight may be passed to other aircraft when the controller considers that it may be useful to them. Whenever this is done it shall be stated that the information originated from an aircraft landed or from an aircraft in flight and the time at which the observation was made. Aircraft reports of meteorological conditions likely to affect safety shall always be passed to other aircraft likely to be affected.
- c. Radar controllers observing cloud echoes shall advise aircraft under their control who are likely to be affected.
- d. Runway Visual Range Observations.
- e. Weather phenomena observed by controllers when such phenomena has not been reported by the Meteorological Office, may be passed directly to the aircraft. Such messages shall be transmitted in the following format :-

“TOWER OBSERVES ... (details of phenomena).”

*Note 1. Whenever a weather report is passed to an aircraft the time of observation shall be included.*

*Note 2. Controllers shall also pass such information to the Meteorological Office as soon as possible.*

### **9.3.5.9.2 VOLMET**

**9.3.5.9.2.1** The VOLMET message is intended to provide pilots with information on Destination Aerodromes. Weather information for selected aerodromes within a certain area will be broadcast. This information is usually broadcast on the voice channel of a suitable VOR, but may also be broadcast by means of a discrete VHF channel. The bulk of weather information requirements will be satisfied by VOLMET broadcasts, if provided.

**9.3.5.9.2.2** If VOLMET is not available, weather reports, forecasts or SIGMET messages shall be passed direct to aircraft on operational frequencies.

### **9.3.5.9.3 Automatic Terminal Information Service (ATIS)**

**9.3.5.9.3.1** The ATIS message is intended to provide the pilot with the complete range of information about an aerodrome necessary to allow him to make a definite decision about his approach and landing or his take-off.

**9.3.5.9.3.2** ATIS messages shall contain all or part of the following elements of information in the order listed:-

- a. Name of the aerodrome.
- b. ATIS designator.
- c. Time of observation.
- d. Type of approach(es) to be expected (if required).
- e. The runway(s)-in-use.

- f. Significant runway conditions (e.g. wet runway etc.).**
- g. Surface wind direction and speed, including significant variations.**
- h. Visibility, and (when applicable RVR).**
- i. Present weather.**
- j. Clouds ( ICAO designators and bases).**
- k. Air temperature.**
- l. Dew point.**
- m. Altimeter settings.**
- n. Any available information on significant meteorological phenomena in the approach, take-off and climb-out areas.**
- o. Trend.**
- p. Other essential operational information, if appropriate.**

**9.3.5.9.3.3** If ATIS is not available the above elements shall be passed by the relevant unit directly to the aircraft.

#### **9.3.5.9.4 Runway Visual Range (RVR)**

**9.3.5.9.4.1** The Runway Visual Range system has been evolved to make available a more precise assessment of visual range in relation to a particular runway when visibility is 1500 m. or less.

**9.3.5.9.4.2** RVR can be measured by using optical measuring equipment or manually by calculating the distance between observable runway lights.

- 9.3.5.9.4.3** RVR is measured up to a maximum value of 1500 m. RVR values up to 800 m shall be given in increments of 30 m to 60 m, in accordance with available observations, and values above 800 m shall be given in increments of 100 m. RVR values which do not fit the reporting scale in use shall be rounded down to the next lower step in the reporting scale. If RVR is observed from more than one location along the runway, the value for the touchdown zone shall be given first and shall be followed by all the values for successive locations whenever one of these values is lower than the value for the touchdown zone and less than 800 m. The respective locations shall be identified in a concise and unambiguous manner.
- 9.3.5.9.4.4** The RVR value is calculated by converting into a distance in meters the number of runway lights which can be seen along one side of the runway from the observer's position. This distance indicates the visual range which a pilot may expect from the cockpit of an aircraft, stationary on the centre - line at or near the downwind end of the runway with eye level 15 ft above the runway. Methods of calculation of RVR by means of visible runway – edge lights shall be published in local airport manuals.
- 9.3.5.9.4.5** RVR observations will be made whenever the officially reported meteorological visibility is equal to or less than 1500 m or some higher value as agreed locally.
- 9.3.5.9.4.6** RVR assessment shall be made before an aircraft departs and 15 min. before the ETA of an arriving aircraft. Thereafter reports of significant changes shall be made until the aircraft has landed.
- 9.3.5.9.4.7** A “significant change” is any variation in the number of runway lights, flares or markers visible to the observer, corresponding to one increment or more as listed below:-

50 to	150 m
150 to	800 m
800 to	1500 m

#### **9.3.5.9.4.8 Transmission of RVR Values**

**9.3.5.9.4.8.1 RVR is normally assessed in multiples of either 50 or 100 m. ATC must accept RVR values as a factual figure and not attempt to qualify it in any way when passing the value to pilots or other authorities, except as detailed in Item 9.3.5.9.4.9.**

**9.3.5.9.4.8.2 Values in excess of 1500 m will never be used. Should the calculated value exceed this figure, in spite of the official visibility being below it, ATC will merely state “RVR more than 1500 m”. If no markers or lights can be seen by the observer the RVR shall be stated as “Less than 50 m” (or the appropriate lowest value).**

**9.3.5.9.4.8.3 RVR values shall be passed to all aircraft at the commencement of each approach for landing and before take-off:-**

- a. when the official meteorological visibility is less than 1500 m or,**
- b. whenever the RVR is observed to be less than 1500 m.**

*Note. Significant changes shall be passed to incoming aircraft until they have landed.*

#### **9.3.5.9.4.9 Additional Information**

**9.3.5.9.4.9.1 On occasions, RVR conditions are worse further along the runway than the observer can see from his observing position. In order that more complete information may be made available, reports made by pilots of arriving and departing aircraft and information gained by observations made from the control tower will be added to the official RVR figure. Observations made from the Control Tower shall be confined to daylight hours and shall only be made when the controller has time available from his normal duties.**

**9.3.5.9.4.9.2 Information received from pilots should be included in RVR reports for the succeeding 5 minutes and should be passed in the following format:-**

**“RVR ..... (metres), thicker patches reported farther along the runway by pilot of landing/departing aircraft”.**

**9.3.5.9.4.9.3 Information obtained from controller observations shall be passed in the following form:-**

**“RVR ..... (metres), thicker patches observed from control tower farther along the runway”.**

\*\*\*\*\*

\*\*\*\*\*

\*\*\*\*\*