International Civil Aviation Organization

WORKING PAPER

Twenty-fourth Meeting of the Meteorology Sub-group (MET SG/24) of the Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG)

Web-conference, 16 – 20 June 2019

Agenda Item 6: Regional guidance material

ROBEX HANDBOOK UPDATES

(Presented by the Secretariat)

SUMMARY

This paper presents a proposal to update the Appendices of the Regional OPMET Bulletin Exchange (ROBEX) Handbook for the meeting to review and approve. The proposal is based on outcomes from the conjoint Eighteenth Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/18) and Tenth Meeting of the Meteorological Services Working Group (MET/S WG/10), web-conference, 27 to 31 July 2020, and supplementary information from Australia. The proposal includes: amendments to METAR and TAF bulletins (Appendix A and Appendix B), a revised procedure and format for METNO (Appendix E) and updates to ROBEX focal points' contact information (Appendix I).

1. INTRODUCTION

1.1 Improved safety and efficiency of international air navigation is supported by improved availability of the operational meteorological information (or OPMET bulletins), which are needed for flight planning and in-flight re-planning and provided by ICAO Member States.

1.2 The Regional OPMET Bulletin Exchange (ROBEX) scheme provides ICAO APAC States with a systematic plan to successfully exchange OPMET bulletins in the APAC region and inter-regionally with the AFI, EUR, MID, NAM and SAM regions.

1.3 The ROBEX Handbook provides guidance to States on the optimization of the ROBEX scheme. It defines the responsibilities and procedures for the ROBEX centres and the content and format of the ROBEX bulletins. As part of the work of the MET SG, the MET/IE WG keeps the ROBEX scheme under review and prepares proposals for updating the ROBEX Handbook, as necessary.

1.4 ICAO publishes updates to the ROBEX Handbook on the ICAO APAC Office website at: www.icao.int/apac > APAC eDocuments > MET. ICAO published the latest version of the ROBEX Handbook; i.e., the Thirteenth Edition, dated March 2019, in November 2019, based on updates approved by MET SG/22.

1.5 This paper invites the meeting to review and approve (for publication and use by States) proposed updates to the ROBEX Handbook, based on outcomes from the conjoint session of MET/IE WG/18 and MET/S WG/10 (27 to 31 July 2020) and supplementary information from Australia. The proposal includes: updates to ROBEX focal points' contact information; amendments to METAR and TAF bulletins; and a revised procedure and format for METNO.

2. DISCUSSION

Proposed updates to the ROBEX Handbook, Appendix A and Appendix B

2.1 The conjoint session of MET/IE WG/18 and MET/S WG/10 endorsed updates proposed by Australia and Thailand to the content of the bulletins in the ROBEX Handbook, Appendix A – *Collection and Dissemination of METAR (SA) Bulletins* and Appendix B – *Collection and Dissemination of TAF (FT) Bulletins*. Subsequently, Australia provided ICAO with supplementary proposed updates to ROBEX bulletins.

2.2 The proposed updates (in 2.1) reflect changes made by Australia and Thailand to ROBEX Bulletins compiled by Regional OPMET Centres (ROCs) Brisbane (YBBN) and Bangkok (VTBB), which became effective on 5 November 2020 and 14 May 2020, respectively. The proposed updates are highlighted (at Appendix A and Appendix B) in the **Attachment** to this paper.

Proposed updates to the ROBEX Handbook, Appendix E

2.3 The conjoint session of MET/IE WG/18 and MET/S WG/10 supported a proposal by the Chair of MET/IE WG to align (with the equivalent procedures in the ICAO EUR Region) the "Changes to OPMET Bulletin Procedures" (METNO procedures), which are described in the ROBEX Handbook at para. 12.1 and Appendix E.

2.4 Subsequent to the above, the Chair of MET/IE WG coordinated further developments of the proposed, revised procedure for METNO, which is highlighted (at Appendix E) in the **Attachment** to this paper.

Proposed updates to the ROBEX Focal Points, Appendix I

2.5 The conjoint session of MET/IE WG/18 and MET/S WG/10 endorsed updates proposed by States to the Focal Point information in the ROBEX Handbook, Appendix I. The proposed updates are highlighted (at Appendix I) in the **Attachment** to this paper.

3. ACTION BY THE MEETING

3.1 This paper invites the meeting to review the proposed updates to the ROBEX Handbook, as discussed above and presented at the **Attachment** to this paper, and approve the updates for publishing and for use by States.

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INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA PACIFIC REGION
ROBEX HANDBOOK

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RECORD OF AMENDMENTS AND CORRIGENDA

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No.	Date of issue	Date entered	Entered by
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Acronyms and Abbreviations

ACC	Area Control Centre
ADMIN	Administrative message
AFI	Africa-Indian Ocean Region
AFS	Aeronautical Fixed Service
AFTN	Aeronautical Fixed Telecommunication Network
AIREP	Air-report
AMHS	ATS Message Handling System
AMO	Aerodrome Meteorological Office
AMS	Aeronautical Meteorological Station
ANP	Air Navigation Plan
AOP	Aerodrome Operations
APAC	Asia Pacific Region
APANPIRG	Asia/Pacific Air Navigation Planning and Implementation Regional Group
ARS	Special Air-report indicator
ASIA	Asia Region
ASIA/PACIFIC	Asia and Pacific Regions
ATM	Air Traffic Management
ATS	Air Traffic Services
COM	Communications
CTA	Control Area
eANP	Electronic Air Navigation Plan
eDocuments	Electronic documents
EUR	European Region
FASID	Facilities And Services Implementation Document
FIR	Flight Information Region
GML	Geography Mark-up Language
HF	High Frequency
ICAO	International Civil Aviation Organization
ICD	Interface Control Document
IROG	Inter-regional OPMET Gateway
IWXXM	ICAO Meteorological Information Exchange Model
METAR	Aerodrome Routine Meteorological Report
MET/IE WG	Meteorological Information Exchange Working Group
MID	Middle East Region
MWO	Meteorological Watch Office
NOC	National OPMET Centre
OPMET	Operational Meteorological Information

PAC	Pacific Region
PIRG	Planning and Implementation Regional Group
ROBEX	Regional OPMET Bulletin Exchange
ROC	Regional OPMET Centre
RODB	Regional OPMET Data Banks
SADIS	Secure Aviation Data Information Service
SAM	South American Region
SIGMET	Significant Meteorological Information
SPECI	Aerodrome Special Meteorological Report
SUG	SADIS User Guide
TAC	Traditional Alphanumeric Code
TAF	Aerodrome Forecast
TC	Tropical Cyclone
TCA	Tropical Cyclone Advisory
TCAC	Tropical Cyclone Advisory Centre
VA	Volcanic Ash
VAA	Volcanic Ash Advisory
VAAC	Volcanic Ash Advisory Centre
WAFC	World Area Forecast Centre
WAFS	World Area Forecast System
WG	Working Group
WIFS	WAFS Internet File Service
WMO	World Meteorology Organization
XML	Extensible Mark-up Language

1. INTRODUCTION

1.1 The Regional Operational Meteorological (OPMET) Bulletin Exchange (ROBEX) scheme was established by the MID/SEA COM/MET Regional Planning Group at its first meeting in Bangkok, July 1972. The scheme became operational in 1974 and has since been successfully exchanging OPMET information in the ASIA/PAC (APAC) region and inter-regionally with the AFI, EUR, MID, NAM and SAM regions.

1.2 The ROBEX scheme was intended initially only for METAR exchange; AIREP and TAF exchanges were added to the scheme at a later stage. The operation of the ROBEX scheme included exchange of OPMET bulletins between the originating tributary offices and the bulletin compiling centres, which, according to their functions and responsibilities, were classified as Main Collection Centres or Sub-collection Centres, or TAF Collection Centres. The operational exchange has been carried out according to agreed transmission schedules; the bulletin contents were specified in the ROBEX Handbook.

1.3 Based on COM facilities of very limited capacity in the early seventies, the ROBEX scheme was strictly planned to accommodate only those OPMET exchanges considered vital for the flight operations. Over the years, the COM facilities have improved considerably and the ROBEX scheme has developed accordingly. The ROBEX Handbook is dynamic in nature in that it is updated regularly to reflect current communications (COM) facilities and the requirements of users for OPMET.

1.4 The ROBEX Handbook is the main guidance material providing detail on the procedures for OPMET exchange under the ROBEX scheme. The Handbook defines the responsibilities of the Regional OPMET Centres (ROCs) and the procedures to be followed. It also defines the content and format of the ROBEX bulletins.

1.5 The ROBEX Handbook is published and kept up-to-date by the ICAO APAC Office (Bangkok).

1.6 Although the ROBEX Handbook primarily covers the exchange of OPMET in the ASIA/PAC Region, it also provides information on the exchange of OPMET inter-regionally as agreed with the other regions.

2. ROBEX SCHEME – GENERAL

2.1 Objective

2.1.1 The main purpose of the Regional Operational Meteorological Bulletin Exchange (ROBEX) Scheme is to ensure the;

a) Most efficient exchange of OPMET information within APAC and with the other ICAO regions to meet the requirements of the users of OPMET information; and

b) Implementation of the OPMET-related SARPs in *Annex 3* and *Annex 10*, and the relevant provisions of the APAC Air Navigation Plan (ANP) in a highly efficient and standardized way.

2.2 Structure

2.2.1 The above objective is achieved by implementing a number of Regional OPMET Centres (ROC), Regional OPMET Data Banks (RODB), and Inter-regional OPMET Gateways (IROG). All these operational units form the ROBEX scheme. In order to ensure seamless global exchange of the required OPMET information, the ROBEX scheme is consistent with similar schemes in the other ICAO regions, as well as with the AFS distribution systems used to disseminate OPMET data.

2.3 Purpose

2.3.1 The ROBEX scheme produces and delivers to the aviation users the required OPMET information in the form of predefined bulletins. The scheme should handle all types of OPMET information in the Traditional Alphanumeric Code (TAC) and the new ICAO Meteorological Exchange (IWXXM) form and should provide facilities and services for scheduled and non-scheduled delivery of OPMET information to the users.

2.4 Introduction of IWXXM Exchange

2.4.1 ICAO Annex 3 Amendments *76, 77* and *78* provide the first steps to the transition of Traditional Alphanumeric Code (TAC) formatted OPMET data towards XML formatted data in compliance with the ICAO Meteorological Information Exchange Model (IWXXM).

Amendment 76 (14 November 2013) enabled the bilateral exchange of XML data for those States in a position to do so.

Amendment 77 (10 November 2016) enables the international exchange of XML-formatted METAR/SPECI, TAF, AIRMET and SIGMET, VAA and TCA.

Amendment 78 (8 November 2018) will require the international exchange of XML-formatted METAR/SPECI, TAF, AIRMET and SIGMET, VAA and

TCA to be raised to a standard although the provisions relating specifically to IWXXM will not become applicable until 5 November 2020.

2.4.2 The phased transition of TAC OPMET data to IWXXM OPMET data is to be considered as a first step towards the ICAO System Wide Information Management (SWIM) concept.

2.4.3 This edition of the Handbook focuses largely on the exchange of OPMET in TAC form because all States currently have the ability to send and receive OPMET in TAC form. Only a limited number of States have developed the capability to send and receive OPMET in IWXXM. In addition, AMHS with FTBP has yet to be implemented in a number of APAC States. It should be noted that AFTN cannot be used to disseminate IWXXM coded OPMET. However, some information on the exchange of OPMET in IWXXM is provided in this Handbook, but detailed information on IWXXM, and the transition from TAC to IWXXM, is provided in the document *Guidelines for the Implementation of OPMET Data Exchange using IWXXM* available on the APAC website in the MET section under APAC eDocuments (https://www.icao.int/APAC/Pages/edocs.aspx).

2.5 Management

2.5.1 Monitoring of the OPMET exchange under the ROBEX scheme, and planning for improvements and preparation of proposals for any changes of the scheme that may become necessary, are carried out by the ASIA/PAC Air Navigation Planning and Implementation Regional Group (APANPIRG). In order to achieve these tasks, the ROBEX implementation status and planning is part of the agenda of the MET sub-groups of APANPIRG, and in particular the MET Information Exchange (MET/IE) Working Group (WG).

2.5.2 Any proposals for amendments to the ROBEX scheme, which States or international organizations concerned consider necessary, due to changes in the operational requirements for OPMET data or to developments of the AFS system, are normally forwarded for consideration to the ICAO Asia and Pacific Office, Bangkok.

2.6 Requests for OPMET (Request and Reply)

2.6.1 The RODBs provide a request and reply facility to allow users to request OPMET on a non-regular or occasional basis. This is not intended for routine requests, which should be arranged through the implementation of predetermine regular OPMET exchange.

2.6.2 Guidance on the interrogation procedures for access to the designated RODBs in the ASIA/PAC Region to request OPMET is provide in *Appendix H*.

3. OPMET INFORMATION AND OPMET EXCHANGE

3.1 OPMET data types

3.1.1 The following OPMET data types should be handled by the ROBEX scheme:

Data type	Abbreviated name	WMO data type designator	
		TAC	IWXXM
Aerodrome reports	METAR SPECI	SA SP	LA LP
Aerodrome forecasts	TAF: 12 to 30 hour	FT	LT
SIGMET information	SIGMET SIGMET for TC SIGMET for VA	WS WC WV	LS LY LV
AIRMET information	AIRMET	WA	LW
Volcanic Ash and Tropical Cyclone Advisories	Volcanic Ash Advisory Tropical Cyclone Advisory	FV FK	LU LK
Air-reports	AIREP SPECIAL (ARS)	UA	N/A
Space Weather Advisory	SWXA	FN	LN
Administrative	METNO	NO	N/A

Note: IATA TAF requirements in the ASIA/PAC region are for TAF validity of either 24 or 30 hours. Some States issue 12- and 18-hour TAF, which don't meet IATA requirements, but are nevertheless classified as FT for the WMO data type designator.

3.2 OPMET bulletins

3.2.1 The exchange of OPMET data is carried out through bulletins containing one or more meteorological messages (METAR, SPECI, TAF or other OPMET information). An OPMET bulletin contains messages of the same type.

3.2.2 The format of OPMET bulletins is determined by:

***ICAO Annex 10**, Aeronautical telecommunications* - AFTN envelope of the bulletin;

***WMO-No.386**, WMO Manual on the Global telecommunication System* - WMO abbreviated heading of the bulletin;

***ICAO Annex** 3 and **WMO-No.306**, Manual on Codes* - format and coding of the information included in the bulletin.

3.3 Types of OPMET exchange

3.3.1 ***Regional exchange – ROBEX scheme***

3.3.1.1 The ROBEX scheme covers the exchange of OPMET information within the APAC region and to and from adjacent ICAO regions. It includes several types of exchanges as described below.

3.3.1.1.1 *Regular exchange* is a scheduled exchange that encompasses collection of messages from the originating stations, compiling of bulletins and their dissemination according to predetermined distribution schemes. The collection and distribution is carried out at fixed times and the bulletin content is defined in this Handbook.

3.3.1.1.2 *Non-regular exchange*

The RODBs store OPMET data and make this available on request. The procedure for requesting OPMET is provided in the *Appendix H*.

3.3.2 ***Inter-regional OPMET exchange***

3.3.2.1 Exchange of OPMET data between the APAC region and the other ICAO regions is carried out via designated centres, which serve as Inter-regional OPMET Gateways (IROG). An IROG is set up for sending and receiving specified OPMET data between the APAC region and other ICAO regions.

3.3.2.2 Inter-regional OPMET exchange via IROGs is carried out through the ground segment of the AFS (AFTN/AMHS).

3.3.3 ***Exchange of OPMET information through the Internet.***

3.3.3.1 All APAC OPMET data handled by the ROBEX scheme is relayed to the SADIS and WIFS Service Providers allowing users to retrieve the data via SADIS and WIFS.

3.3.4 ***Other OPMET exchanges***

3.3.4.1 Where OPMET exchanges described in the above paragraphs are not sufficient, direct AFTN/AMHS addressing can be utilized by the originating centres or NOCs.

4. THE COMPOSITION OF ROBEX

4.1 The ROBEX scheme involves a number of aeronautical meteorological stations, aeronautical telecommunication stations, aerodrome meteorological offices and other operational units. The following operational units are considered to be components of the ROBEX scheme:

4.1.1 ***Originating station*** – an aeronautical meteorological station, aerodrome meteorological office, forecasting office, MWO, TCAC, or a VAAC. The duties and responsibilities of these originating stations are defined by the State's meteorological authority.

4.1.2 ***National OPMET centre (NOC).*** Normally, a NOC is associated with the State's national AFTN/AMHS COM centre. The role of the NOC is to collect all OPMET messages generated by the originating stations in the State and to send them to the responsible ROBEX bulletin-compiling centre (ROC). Some NOCs serve also as ROCs. National regulations should be developed to ensure that NOCs disseminate the international OPMET data within their own State, as necessary.

4.1.3 Regional OPMET Centre (ROC).

4.1.3.1 ROCs are responsible for the collection of OPMET messages from the originating stations or NOCs in their area of responsibility and for compiling these messages into ROBEX bulletins. *Tables A and B of the ROBEX Handbook* define the areas of responsibility (or collection areas) of the ROCs for METAR/SPECI and TAF.

4.1.3.2 The ROCs are responsible for the dissemination of bulletins compiled by them to:

- Other ROCs, according to predefined distribution lists, specific for each bulletin;
- APAC RODBs;
- NOCs or other COM or MET offices in the States in their area of responsibilities, as agreed between the ROC and the States' authorities concerned.

4.1.4 ***Regional OPMET Data Banks (RODB)***

4.1.4.1 Five centres have been designated by APANPIRG to serve as Regional OPMET Data Banks (Bangkok, Brisbane, Nadi, Singapore and Tokyo).

4.1.4.2 The **main responsibilities** of the RODBs are defined as follows:

- To support the ROBEX Scheme and to facilitate a regular exchange of OPMET information based on predetermined distribution within the APAC Region; and

- To provide facilities for request/response type of access to the stored OPMET data for users to obtain non-regular or occasional information.

Note 1: The interrogation procedures applicable to the OPMET data banks and catalogues are provided in Appendix H.

Note 2: Responsibilities of RODBs are given in 4.1.4.2, 10.2, 10.3 and 12.3

4.1.5 ***Inter-regional OPMET Gateways (IROG).*** The Inter-regional OPMET Gateways in the APAC Region are the designated RODBs. Each RODB is assigned responsibility for the exchange of OPMET information with other ICAO Regions. The responsibilities of the IROGs are shown in *11.1* of this Handbook.

4.1.6 ***Support to SADIS and WIFS.*** The IROGs should facilitate the global exchange of OPMET data carried out through SADIS and WIFS. In order to achieve this, close liaison should be maintained between the IROGs and the corresponding SADIS and WIFS gateways. Availability of APAC data on SADIS and WIFS should be monitored and any systematic shortfalls of data identified should be reported to the relevant ICAO regional office.

4.2 The overall structure of the ROBEX scheme is presented in *Appendix G*.

5. COMMUNICATIONS - GENERAL

5.1 Exchange of OPMET

5.1.1 According to *Annex 3, Chapter 11, 11.1.9*, the telecommunications facilities used for the exchange of OPMET should be the aeronautical fixed service (AFS) or, for the exchange of non-time critical OPMET, the public internet, subject to availability, satisfactory operation and bilateral/multilateral and/or regional air navigation agreement.

Note 1: Aeronautical fixed service Internet-based services, operated by the World Area Forecast Centres (WAFC), support the global exchanges of OPMET.

Note 2: Guidance material on non-time critical OPMET and relevant aspects of the public Internet is provided in the Guidelines on the Use of the Public Internet for Aeronautical Applications (Doc 9855).

5.2 Use of AFTN/AMHS

5.2.1 The AFTN is used for the exchange of OPMET in TAC form, and AMHS is used for the exchange in IWXXM form. It is to be noted that IWXXM cannot be exchanged over the AFTN due to the characterset included in IWXXM. When AMHS is used this must be either AMHS Extended or AMHS with File Transfer Body Part (FTBP).

5.2.2 AFTN/AMHS circuits are used for the collection of OPMET messages by the ROCs, and for regional and inter-regional exchanges of OPMET bulletins. However, the exchanges are subject to the use of AFTN and AMHS as noted in 5.2.1.

5.2.3 OPMET bulletins containing TAC or IWXXM formatted OPMET transmitted via AFTN/AMHS shall be encapsulated in the normal AFTN envelope (for TAC), and for IWXXM as described in the *Guidelines for the Implementation of OPMET Data Exchange using IWXXM* available at https://www.icao.int/APAC/Pages/edocs.aspx..

5.2.4 AFTN/AMHS messages and bulletins containing OPMET shall achieve transit times of less than 5 minutes unless otherwise determined by regional air navigation agreement.

5.2.5 OPMET bulletins (TAC) transmitted via AFTN shall use the following priority indicators:

FF – for SIGMET, AIREP SPECIAL, VAA, TCA and TAF AMD;

GG – for TAF, METAR and SPECI

5.2.6 For information about the transmission of OPMET bulletins (IWXXM) via AMHS, refer to the document *Guidelines for the Implementation of OPMET Data Exchange using IWXXM* available on the APAC website in the MET section under APAC eDocument (https://www.icao.int/APAC/Pages/edocs.aspx).

6. METAR/SPECI EXCHANGE

6.1 General

6.1.1 Routine METAR reports should be prepared for the international aerodromes listed in the *eANP, Volume I, Table AOP I-1*, and in *Volume II, Table MET II-2.* METAR should be issued hourly or half-hourly throughout the 24 hours of each day as determine by regional air navigation agreement or by agreement by individual States (refer to *6.1.2*).

6.1.2 METAR from all international aerodromes (referred to as AOP aerodromes) listed in the Tables referred to in *6.1.1*, should be included in the regular ROBEX exchange. This also includes METAR from a number of domestic aerodromes, required by the users as alternate aerodromes (referred to as non-AOP aerodromes), and should be included in the regular ROBEX exchange, if so agreed by the States concerned.

Note: When OPMET data from non-AOP aerodromes is required by users, the corresponding State is consulted on its agreement to provide the additional information.

6.1.3 A description of the ASIA/PAC METAR bulletins provided in the regular ROBEX exchange, including the responsible compiling ROC, WMO bulletin identification, list of aerodromes, observation times and AFTN distribution are given in *Appendix A*.

6.1.4 SPECI reports are included in separate bulletins and should be disseminated in the same way as the METAR reports originated by the same aerodromes. It should be noted that METAR and SPECI reports are not to be included together in a bulletin.

6.1.5 The exchange of METAR/SPECI messages outside the ROBEX scheme, if necessary, should be carried out by direct AFTN/AMHS addressed messages.

6.2 Responsibilities of originating stations and NOCs

6.2.1 The originating stations (aeronautical meteorological stations) and/or NOCs should prepare METAR messages for the observation times Indicated in *Appendix A* and send them to their responsible ROC.

6.2.2 SPECI should be prepared between the regular observation times, following the requirements set out in Annex 3, and sent with no delay to the responsible ROC.

6.2.3 In preparing METAR and SPECI messages, the originating stations should follow strictly the specifications for METAR and SPECI in *Annex 3 (Chapter 4 and Appendix 3 including the template in Table A3-2)* and the WMO METAR and SPECI code forms (*FM 15-XII METAR and FM 16-XII SPECI, WMO – No. 306, Manual on Codes, Volume I.1, Part A – Alphanumeric Codes)*.

6.2.4 METAR messages should be sent to the responsible ROC before the cut-off time specified by the ROC, to allow for timely compilation of the METAR bulletin. If for some reason a METAR message has not been sent before the cut-off time, the originating station/NOC should send it as soon as possible after that, as a delayed message. The originating stations/NOCs should follow strictly the schedules specified for METAR messages and keep to a minimum the number of delayed messages.

6.2.5 METAR and SPECI messages should be quality controlled by the originating stations/NOCs and, when necessary, a corrected message should be sent immediately after an error in an already transmitted message had been identified.

Note: Procedures applying to the corrected and delayed messages are given in Appendix D.

6.3 ROCs – METAR and SPECI Responsibilities

6.3.1 ROCs should collect METAR messages from the aerodromes in their area of responsibility and compile METAR bulletins, according to *Appendix A*. The content of bulletins and the order of stations in each bulletin should be kept fixed until a bulletin change is requested and coordinated according to the established procedure.

6.3.2 ROCs should determine a cut-off time for the reception of METAR from the stations in their area of responsibility. At the cut-off time, the ROC should compile METAR bulletin(s) containing all prescribed aerodromes, indicating any missing METAR with "NIL".

6.3.3 At scheduled transmission times, ROCs should transmit the compiled METAR bulletins to other ROCs and RODBs according to the distribution lists specified for each METAR bulletin in *Appendix A*. METAR bulletins should be filed for transmission not later than 5 minutes after the observation time.

6.3.4 ROCs should transmit the METAR bulletins compiled by them, as well as bulletins received from other ROCs, as necessary, to the NOCs and/or other offices in the States in their area of responsibility, as agreed between the ROC and the meteorological authorities of the States concerned.

6.3.5 A SPECI when received by a ROC should be sent as a SPECI bulletin to the same addresses, to which METAR from the issuing aerodrome are sent. Normally, a SPECI bulletin should contain a single SPECI and must not be included in any METAR bulletin.

6.3.6 The WMO heading of a SPECI bulletin should be constructed in the same way as the WMO heading of the METAR bulletin, which contains the aerodrome, for which the SPECI is issued, by using SP data type designator instead of SA.

6.3.7 A METAR message received by the ROC after the scheduled transmission of the corresponding bulletin is a delayed METAR. The ROC should send a delayed bulletin as soon as one or more delayed messages are received or at

specified times after the scheduled bulletin time (e.g., the first delayed bulletin (RRA) issued 10 minutes after the regular time; the second delayed bulletin (RRB) issued 20 minutes after the regular time, etc.).

6.3.8 As soon as a corrected METAR or SPECI message is received from a station the ROC should transmit it as a corrected bulletin to all recipients.

6.4 METAR Bulletins in TAC - Format and Content

6.4.1 Each METAR message in a METAR bulletin should start with the code word METAR followed by the ICAO location indicator (CCCC) of the aerodrome and the date/time group (YYGGggZ), indicating the official time of observation. Corrected METAR messages, should start with METAR COR.

6.4.2 The following is an example of the format to be applied in preparing a METAR bulletin by the ROCs:

Parts of Message	ROBEX SA Bulletin
AFTN header	
Priority Indicator and Address Date and Time of filing and Originator	GG VTBBYPYX 271304 ZBBBYPYX
WMO Abbreviated Heading	SACI31 ZBBB 271300
METAR messages	METAR ZBAA 271300Z …….. = METAR ZBTJ 271300Z …….=
AFTN Normal Ending	NNNN

Note: The inclusion of the code name METAR in front of each message in the METAR bulletin is mandatory.

6.4.3 The rules related to the use of the BBB group in the WMO abbreviated heading, with regard to delayed or corrected bulletins, are given in *Appendix D*.

6.4.4 For METARs, which are not available at the time of compilation of the bulletin, the word NIL should be inserted following the date/time group indicating the time of the observation.

Example: METAR ZBTJ 271200Z NIL=

6.5 SPECI Bulletins in TAC - Format and Content

6.5.1 A SPECI message included in a SPECI bulletin should start with the code word SPECI followed by the ICAO location indicator (CCCC) of the aerodrome and a date/time group (YYGGggZ) indicating the time of the observation of the meteorological conditions for which the SPECI is issued. Corrected SPECI messages, should start with SPECI COR.

6.5.2 The following is an example of the format to be applied in preparing a SPECI bulletin by the ROC:

Parts of Message	ROBEX SP Bulletin
AFTN header	
Priority Indicator and Address Date and Time of filing and Originator	GG VTBBYPYX 081647 ZBBBYPYX
WMO Abbreviated Heading	SPCI31 ZBBB 081645
SPECI message	SPECI ZBAA 081645Z ..…… =
AFTN Normal Ending	NNNN

6.6 METAR and SPECI Bulletins in IWXXM - Format and Content

6.6.1 Refer to the document *Guidelines for the Implementation of OPMET Data Exchange using IWXXM* available on the APAC website in the MET section under APAC eDocuments (https://www.icao.int/APAC/Pages/edocs.aspx).

7. TAF EXCHANGE

7.1 General

7.1.1 Aerodrome forecast (TAF) should be prepared by the aerodrome meteorological offices (AMO) or other meteorological offices, designated for the provision of TAF by the State's meteorological authority, for all international aerodromes, for which TAF is required (refer to the *eANP, Volume II, Table MET II-2*

7.1.2 All TAFs required should be included in the regular ROBEX exchange. In addition, TAFs from a number of domestic aerodromes required by the users as alternate aerodromes, should also be included in the regular ROBEX exchange, if so agreed by the States concerned.

Note: Airline users require that TAF for all international aerodromes listed in the eANP, Volume I, Table AOP I-1, and in Volume II, Table MET II-2, should be available through regular exchange and through the Internet distribution systems SADIS and WIFS.

7.1.3 TAF exchanges not covered by the ROBEX Scheme, but required operationally, should be met by means of direct addressed AFTN/AMHS messages.

7.1.4 The requirements for the exchange of 24 or 30-hour TAFs are listed in the *eANP, Volume II, Table MET II-2*.

7.2 Aerodrome meteorological offices (AMO) and NOCs responsibilities

7.2.1 Originating AMOs (or other designated forecasting offices) should prepare the required TAF messages for the periods of validity indicated in *Appendix B*. TAFs from international aerodromes shall not be issued earlier than one hour prior to the beginning of its validity period. TAFs are to be sent by the AMOs or NOCs to the responsible ROC before the cut-off time determined by the centre, e.g., 5 minutes before the filing/transmission times specified in *Appendix B*.

7.2.2 Aerodrome meteorological offices in preparing TAF should follow strictly the template for TAF in *Annex 3, Appendix 5* and the WMO TAF code form (*FM 51-XII TAF, WMO – No. 306, Manual on Codes, Volume I.1, Part A – Alphanumeric Codes*).

7.2.3 The originating AMOs should monitor TAFs and amended TAF (TAF AMD) should be issued according to the established criteria. Amended TAFs should be sent by the originating station to the responsible ROC with no delay. The optional group BBB should be used in the WMO abbreviated heading to indicate amended TAF in accordance with *Appendix D*.

7.2.4 TAF messages should be quality controlled by the originating meteorological offices and, when necessary, a corrected TAF (TAF COR) should be sent immediately after an error in an already transmitted message had been identified.

7.3 ROCs – TAF Responsibilities

7.3.1 ROCs should collect TAFs from the AMOs and/or NOCs in their area of responsibility and compile TAF Bulletins according to *Appendix B*. The areas of responsibility, as far as practicable, should group together aerodromes and their alternates. ROCs should ensure that TAFs in a single bulletin have common periods of validity.

7.3.2 If necessary, ROCs should prepare two or more separate TAF bulletins using different “ii” values (e.g., "31" and "32”) in the WMO heading. The content of the ROBEX TAF bulletins is specified in *Appendix B*.

7.3.3 ROCs should establish a cut-off time for reception of TAFs from AMOs and/or NOCs in their area of responsibility, e.g., 5 minutes before the filing/transmission times specified in *Appendix B*. At the cut-of time ROCs should compile TAF bulletin(s) containing all prescribed aerodromes, indicating any missing TAF with “NIL”.

7.3.4 The filing/transmission times specified in *Appendix B* ensure the OPMET information is available to the users twenty-five (25) minutes prior to the beginning of the TAF validity period.

7.3.5 ROCs should transmit the compiled TAF bulletins, to other ROCs and the RODBs according to the distribution lists as specified for each TAF bulletin in *Appendix B*.

7.3.6 ROCs should transmit the TAF bulletins compiled by them, as well as TAF bulletins received from other ROCs, as necessary, to the NOCs and/or other offices in the States in their area of responsibility, as agreed between the ROC and the meteorological authorities of the States concerned.

7.3.7 A TAF message received by a ROC after the scheduled transmission of the corresponding bulletin is a delayed TAF. The ROC should send a delayed TAF bulletin as soon as one or more delayed messages are received or at specified times after the scheduled bulletin time. The optional BBB group should be used in the WMO bulletin heading accordingly.

7.3.8 Amended TAF (TAF AMD) received from an AMO or NOC should be distributed with no delay as an amended TAF bulletin to all recipients in the distribution list for the TAF bulletin, to which the originating aerodrome belongs. The optional BBB group should be used in the WMO bulletin heading accordingly.

7.4 TAF Bulletins in TAC - Format and Content

7.4.1 Issuance and period of validity

7.4.1.1 24- and 30-hour TAFs should be issued at intervals of six hours, with the period of validity beginning at one of the main synoptic hours (00, 06, 12, 18 UTC), as shown in the table below.

7.4.1.2 All TAFs in a ROBEX TAF bulletin should have a common period of validity. It is not permitted to mix TAF with different periods of validity in one bulletin.

Synoptic hours (UTC)	24-hour TAF		30-hour TAF	
	Period of validity	Filing time (not prior to)	Period of validity	Filing time (not prior to)
00	00-00	23 (-1)*	00-06 (+1)	23 (-1)
06	06-06	05	06-12 (+1)	05
12	12-12	11	12-18 (+1)	11
18	18-18	17	18-00 (+1)	17

Note: "-1" indicates the previous day and "+1" indicates the next day

7.4.2 Each TAF message in a TAF bulletin should start with the code word TAF followed by the ICAO location indicator (CCCC) of the aerodrome and the date/time group (YYGGggZ), indicating the official time of issuance. Corrected TAF messages, should start with TAF COR. Amended forecasts should start with TAF AMD.

7.4.3 The use of the BBB group in the WMO heading for delayed, corrected, or amended TAFs is described in *Appendix D*.

7.4.4 The following is an outline of the format to be applied by a ROC in preparing a TAF TAC bulletin, containing FT TAFs (24 or 30 hour) :

Parts of Message	ROBEX FT Bulletin
AFTN header	
Priority Indicator and Address Date and Time of filing and Originator	GG YBBBYPYX 271104 ZBBBYPYX
WMO Abbreviated Heading	FTCI31 ZBBB 271100
TAF messages	TAF ZBAA 271100Z 2712/2812..…= TAF ZBTJ 271100Z 2712/2812…….=
AFTN Normal Ending	NNNN

7.4.5 A missing TAF in a TAF bulletin should be indicated with "NIL", as shown in the following example:

TAF VTBD 281000Z NIL=

7.4.6 A cancelled TAF in a TAF bulletin should be indicated with "CNL", as shown in the following example:

TAF VTBD 281100Z 2812/2912 CNL=

7.5 TAF Bulletins in IWXXM - Format and Content

7.5.1 Refer to the document *Guidelines for the Implementation of OPMET Data Exchange using IWXXM* available on the APAC website in the MET section under APAC eDocuments (https://www.icao.int/APAC/Pages/edocs.aspx).

7.6 Summary of OPMET data issuance

7.6.1 A summary of correct methods of issuing OPMET data is provided in the following two tables:

METAR observation, compiling and filing

Function	Responsible Entity	Explanation of Time	Time of task (min)
METAR Observation	Originating stations (AMS, AMO, forecast office)	State determines how often and when, e.g., 30 minutes past the hour 24/7. Examples : H+00, H+30 *Note that the observation time is used in the METAR report*	0
Send METAR observation to NOC	Originating station		<5
Send METAR observations to ROC	NOC		
Bulletin compiling and filing	ROC	Up to 5 minutes after actual time of observation *Note 1: The observation time of the METAR is used in the DTG – YYGGgg of the bulletin header.* *Note 2: The filing time is used in the AFTN header and should be up to 5 minutes after the observation time given in the bulletin header also referred to as the WMO Abbreviated Heading.*	
Send METAR bulletin to: ROCs (predefined distribution list) RODBs NOCs Other MET offices	ROC *via AFTN or AMHS*	Less than 5 minutes	<5
Acceptable time from observation at originating stations to reception by user			<10

TAF issuance, compiling and filing

Function	Responsible Entity	Explanation of Time	Time of task (min)
TAF Issuance	AMO or NOC	State determines time of the beginning of the validity period for four (4) scheduled TAFs each day, i.e. 00, 06, 12, 18Z. *Note: That issuance time of TAF (which is not earlier than one hour prior to the beginning of its validity period) is used in the date/time group (DTG) (YYGGggZ) of TAF messages).* TAF is sent to ROC before the cut-off time of accepting TAF for filing as indicated in *Appendix B* (typically 5 minutes before filing).	Allow enough time to reach ROC before cut-off time
Bulletin compiling and filing	ROC	Bulletins are compiled during the 15 minutes before filing. *Note 1: The TAF issuance time (official filing time) is used in the DTG – YYGGgg of the bulletin header* *Note 2 : The actual filing time is used in the AFTN header and should be after the time given in the bulletin header also referred to as the WMO Abbreviated Heading.* TAF should be filed for transmission not earlier than one hour prior to the beginning of their validity period.	<15
Send TAF bulletin to: ROCs (predefined distribution list) RODBs NOCs Other MET offices	ROC *via AFTN or AMHS*	In less than 5 minutes	<5
Acceptable time for ROC compiling and filing to reception by user			<5

8. EXCHANGE OF SIGMET, TCA and VAA

8.1 SIGMET should be prepared by the meteorological watch offices (MWO) designated by the State's meteorological authority. The MWOs and their areas of responsibility are given in *eANP, Volume II, Table MET II-1*.

8.2 SIGMET messages should be distributed to all RODBs within the Region who should also make the SIGMET messages available on request. In order to facilitate that, the originating MWOs should use the WMO headings given in the *ASIA/PAC Regional SIGMET Guide, Appendix D* for their SIGMET bulletins

Note: The required distribution of SIGMET to MWOs and ACCs in the adjacent FIRs described in the ASIA/PAC Regional SIGMET Guide is not part of the ROBEX exchange and should be arranged by the States outside the ROBEX scheme.

8.3 SIGMET messages should be distributed to other ICAO regions and made available for redistribution through SADIS and WIFS. This distribution should be carried out through the relevant IROGs.

8.4 Detailed information on the format of the SIGMET messages is provided in the *ASIA/PAC Regional SIGMET Guide*.

8.5 Tropical cyclone advisories (TCA) and volcanic ash advisories (VAA) should be issued by the designated tropical cyclone and volcanic ash advisory centres (TCAC and VAAC), as indicated in *FASID Table MET 3A and MET 3B*.

8.6 The TCACs and VAACs should send their advisories to the APAC RODBs. The RODBs should make TCAs and VAAs messages available on request. In order to facilitate that, the originating TCACs and VAACs should use the WMO headings given in the *ASIA/PAC Regional SIGMET Guide, Appendix D*.

8.7 VAA and TCA messages should be distributed to other ICAO regions and made available for redistribution through SADIS and WIFS. This distribution should be carried out either directly by the VAACs and TCACs or through the relevant IROGs.

9. AIREP/AIREP SPECIAL EXCHANGE

9.1 Routine voice air-reports are not required and therefore are not exchanged under the ROBEX scheme (refer to *Annex 3, Appendix 4*).

9.2 Routine air-reports received by data-link communications should be relayed directly to the WAFCs by the ATS units.

9.3 Special voice air-reports received by MWOs are to be sent to WAFCs without delay.

9.4 Special air-reports of pre-eruption volcanic activity should also be sent to the appropriate VAAC. Special air-reports received at the meteorological watch office that are deemed to not warrant issuance of a SIGMET, shall be disseminated in the same way as SIGMET messages.

9.5 When supplementary dissemination of air-reports is required to satisfy special aeronautical or meteorological requirements, such dissemination should be arranged and agreed between the meteorological authorities concerned.

An example AIREP SPECIAL is given below:

FF EGRRVANW KWBCYMYX EGZZMASI RJTDYPYX RKSIYPYX VTBBYPYX
WSZZWWBX YBBBYPYX YPDNYMYX ZJSYYMYX
090726 WSSSYMYX
UASR71 WSSS 090700
ARS QFA129 0328N 12831E 0639 FL380 VOLCANO DUKONO 0608-01
DRIFT OF VA SE PLUME HGT EST FL100 OR LOWER SUP INFO REPORTS
GOOD VISIBILITY=

10. REGIONAL OPMET DATA BANKS (RODB)

10.1 The ASIA/PAC Regional OPMET Data Banks and the AFTN addresses to be used for direct access to the data banks are shown below:

RODB	AFTN ADDRESS	ROCs IN THE AREA OF RESPONSIBILITY
Bangkok	VTBBYZYX	Bangkok/VTBB Mumbai/VABB Colombo/VCCC Delhi/VIDP Karachi/OPKC Kolkata/VECC
Brisbane	YBBBYZYX	Brisbane/YBBN Wellington/NZKL
Nadi	NFFNYZYX	Nadi/NFFN
Singapore	WSSSYZYX	Jakarta/WIII Kuala Lumpur/WMKK Singapore/WSSS
Tokyo	RJTDYZYX	Beijing/ZBBB Hong Kong/VHHH Incheon/RKSI Tokyo/RJTD

10.2 **Responsibilities**

10.2.1 Collect OPMET bulletins from the ROCs in the area of responsibility and store them in a database.

10.2.2 Handle all type of OPMET bulletins, as described in *3.1.1*.

10.2.3 Provide facilities for "request-reply" service to the authorized users.

10.2.4 Maintain a catalogue of bulletins and introduce changes to the bulletins when necessary according to the established procedures.

10.2.5 Quality control the incoming bulletins and inform the ROCs of any discrepancies or shortfalls.

10.2.6 Monitor the OPMET traffic by carrying out regular tests on the availability and timeliness of the bulletins; report to the ICAO Regional Office on the results.

10.3 The interrogation procedures applicable to the designated RODBs are provided in *Appendix H*.

10.4 Guidance on the management and quality control is provided in *Chapter 12* of this Handbook.

11. INTER-REGIONAL OPMET EXCHANGE

11.1 Inter-regional OPMET Gateways (IROG) are designated for the purpose of exchanging OPMET data between ASIA/PAC and the other ICAO Regions, as shown in the table below.

ROBEX IROG	For exchange of OPMET data between Regions
Bangkok (VTBB)	ASIA/PAC and MID (OEJD, OBBI*) ASIA and AFI (FAPR, GOOY)
Brisbane (YBBN)	ASIA/PAC and SAM (SBBR) PAC and AFI (FAPR, GOOY)
Nadi (NFFN)	S. PAC and NAM (KWBC)
Singapore (WSSS)	ASIA/PAC and EUR (EGZZ)
Tokyo (RJTD)	ASIA/PAC and NAM (KWBC)

* Backup to OEJD

11.2 IROGs arrange for relaying all ROBEX bulletins to a corresponding OPMET Gateway in the other ICAO regions concerned. In this regard, detailed OPMET exchange arrangements should be developed by each IROG based on the requirements indicated in the APAC eANP.

11.3 The following principles are applied to IROGs:

IROGs should;

a) Have reliable and efficient AFTN/AMHS connection to the regions, for which they have exchange responsibilities, with adequate capacity to handle the OPMET data flow between the regions;

b) Be associated with AFTN/AMHS relay centres capable of handling efficiently the volume of traffic anticipate; and

c) Be capable of handling all OPMET data types, as described in *3.1.1*.

11.4 In order to avoid duplication of the OPMET traffic and information, all inter-regional OPMET exchange should be directed through the IROGs. Inter-regional exchange via direct AFTN/AMHS addressing from the originator or ROC to recipients in the other ICAO Regions should be avoided, except when bilateral or other agreements require such direct exchanges.

11.5 In order to ensure the global availability of all ROBEX bulletins at the SADIS and WIFS gateways, IROG Singapore should relay all APAC bulletins to the SADIS gateway (London), and IROGs Tokyo and Nadi should relay the bulletins to the WIFS gateway (Washington).

12. MANAGEMENT OF OPMET EXCHANGE

12.1 Changes to OPMET Bulletin Procedures

12.1.1 Information about changes to ROBEX bulletins should be disseminated to all ROCs and national OPMET centres (NOC) concerned well in advance in order to allow the centres to introduce the necessary changes to their message handling systems. In this regard, a lead time of two months (or two AIRAC cycles) is considered appropriate.

12.1.2 The ROC planning the change, should send a notification by e-mail to the ICAO Office, Bangkok with a copy to all ROBEX Focal Points. The notification should include detailed information about the changes and the proposed time schedule. The Regional Office should inform all other ICAO Regional Offices of the changes to be introduced and the effective date of implementation.

12.1.3 Notification via AFTN/AMHS should be done by means of a METNO message, which is to be sent by the originating ROC to all other ROCs and to the respective IROGs in the other ICAO regions two weeks prior to the implementation date. The format of the METNO message is given in *Appendix E*.

12.1.4 All requests by users for changes to ROBEX bulletins should be addressed to the ICAO Regional Office. The Regional Office should carry out the necessary coordination with the States and ROCs concerned. The duration of the coordination process should be minimized so that the period between the user request and the implementation of the change (if agreed) should normally be less than 3 months.

12.2 Quality Management - OPMET Exchange

12.2.1 **Objectives and Scope**

12.2.1.1 **Objectives:** Develop a management system that provides general guidance on procedures applied to OPMET exchange, which includes quality control aspects and introduces a non-real-time monitoring for OPMET exchange.

12.2.1.2 **Scope:** Management of OPMET data exchange will be organized in the following sections:

Quality Control	*Data quality control applies to OPMET validation and correction during data processing and during preparation of messages.*
OPMET Monitoring	*Monitor and evaluate the performance indicators for the scheduled OPMET data.*

12.2.2 **Quality Control – general requirements**

12.2.2.1 Quality control (QC) consists of the examination of OPMET data at NOCs, ROCs and RODBs to check the messages for formatting and coding errors, as well as, for time and space consistency.

12.2.2.2 OPMET data should be checked in real time or as close to it as possible, at the first point, i.e., the originator, which may be: meteorological station, aerodrome meteorological office or meteorological watch office. Errors may occur during coding or transcription of meteorological messages by the observer or forecaster. The originating office should apply quality control procedures during data processing and preparation of messages, in order to eliminate the main sources of errors.

12.2.2.3 The National OPMET centre (NOC) should apply QC procedures on the incoming messages from national sources and on the compiled national bulletins.

12.2.2.4 It is also advisable to apply QC checks at the ROC, where the ROBEX bulletins are received or compiled. If automation is available it should be used, or partly assisted by computing facilities. The principle is that every message should be checked, preferably at the various points along the data chain.

12.2.2.5 The checks that have already been performed by originating offices and ROCs are usually repeated at the OPMET data banks. Erroneous messages found by the RODB should be either rejected or corrected by reference back to the source or by the databank itself. Data corrected by the databanks should be flagged in the database for record purpose.

12.2.2.6 As a result of the quality control process described above, OPMET data of established quality will be used in the exchange and stored in the databanks. The RODBs should compile information with regard to errors that were found and compile records, such as the numbers and types of errors detected during quality control. Such non-conformities should be reported to ICAO Regional Office, Bangkok for follow-up action.

12.2.3 **Quality Control Procedures**

12.2.3.1 General guidance on the quality control procedures for each type of OPMET is outlined in *Appendix F*.

12.3 OPMET Monitoring

12.3.1 **Monitoring of Scheduled OPMET data**

12.3.1.1 The monitoring shall focus on the measurement of three performance indicators (PIs), (Compliance, Availability and Regularity indices) of the scheduled, routine METAR and TAF OPMET data (TAC - SA and FT; IWXXM – LA and LC)) exchanged in the region. The PIs are described in detail in *Appendix F*.

12.3.1.2 Monitoring Reference

The monitoring shall involve the recording and analysis of data provided by the AFTN/AMHS circuit. The three PIs should be monitored against the respective ROBEX Tables.

12.3.1.3 Methodology

Data is monitored with reference to the procedures defined in *Appendix F*.

12.3.2 **Monitoring of Non-Scheduled OPMET data**

12.3.2.1 Monitoring of non-routine OPMET data shall include;

(a) TAC - TCA (FK), VAA (FV) and SIGMET (WC, WS, and WV).
(b) IWXXM – TCA (LK), VAA (LU), SIGMET (LY, LS, LV).

12.3.2.2 Monitoring of SIGMET, VAA and TCA should be performed during the scheduled regional SIGMET tests in accordance with the procedures published by the APAC Office, Bangkok.

12.3.2.3 Additional monitoring of SIGMET issuance may be scheduled as necessary to monitor the issuance of SIGMET in specific FIRs over specific periods when such monitoring would be useful to support the rectification of deficiencies in the provision of SIGMET services.

12.3.2.4 The monitoring results shall be presented in bulletin-oriented format, one line per bulletin indicating the abbreviated header (TTAAii CCCC YGGgg), the FIR/UIR where applicable, receipt time and originator.

12.3.3 **Reporting OPMET monitoring results**

12.3.3.1 OPMET monitoring reports should provide data for all locations where OPMET is required (i.e. locations in *eANP Table MET II-1* and *Table MET II-2*), and additional locations where States have been consulted and agreed to provide this additional information.

12.3.3.2 OPMET monitoring reports should provide sufficient data to help States identify problems in OPMET issuance, e.g., the actual number of messages received per day at locations where OPMET monitoring identifies that the number of messages received does not meet the given percentage of the total number of messages expected.

12.3.3.3 Reports of the results of OPMET monitoring conducted in accordance with the guidelines in this Handbook shoud be presented in a format that enables ease of comparison between the reports from the various designated OPMET monitoring entities (e.g., IATA and RODBs) and ease of interpretation of the data by States and users concerned.

12.4 ROBEX Focal Points

12.4.1 In order to facilitate the exchange of information between the ROCs a system of ROBEX focal points has been developed. Contact details of the persons designated as ROBEX focal points by the relevant State's authorities are provided in *Appendix I*.

Appendices

APPENDIX A - Collection and Dissemination of METAR (SA) Bulletins

Table A : METAR

Explanation of Table

Col.1: Name and ICAO location indicator of the ROC compiling the bulletin.

Col.2: Description of the METAR Bulletin

Col.3: Official observation time of the bulletin

Col.4: Time when bulletin available
Note: O/R indicates Bulletin available on request and NR indicates no report is available

Col.5: Dissemination of the bulletin to other ROCs and RODBs

Notes: *1 The RODB responsible for storing the bulletin is in **bold***

2 Aerodromes not listed in Table AOP 1-1 indicated in italics

3 METAR included in VOLMET broadcasts are listed in APAC, ANP, VOL II, Table MET II-3, VOLMET Broadcasts

Table A : Collection and Dissemination of METAR (SA) Bulletins

1		2			3	4	5	
ROC		**METAR Bulletin**			**Bul. Time**	**Available**	**DISSEMINATION TO**	
Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
ASIA/PAC REGION								
Bangkok	**VTBB**	**SAAE31**	VTBD	BANGKOK/Don Mueang Intl Airport	HH + 00		**BANGKOK**	VTBBYPYX
			VTBS	BANGKOK/Suvarnabhumi Intl Airport	HH + 30		BRISBANE	YBBBYPYX
			VTBU	RAYONG/U-Taphao Intl Airport			SINGAPORE	WSZZYPYM
			VTCC	CHIANG MAI/Chiang Mai Intl. Airport			TOKYO	RJTDYPYX
			VTCT	CHIANG RAI/Chiang Rai Intl Airport			Kolkata	VECCYPYX
			VTSG	KRABI			Colombo	VCCCYPYX
			VTSP	PHUKET/Phuket Intl Airport			Delhi	VIDPYPYX
			VTSS	SONGKHLA/Hat Yai Intl Airport			Hong Kong	VHZZYPYX
							Jakarta	WIZZMCMC
							Kuala Lumpur	WMZZYPYR
							Mumbai	VABBYPYX
							Incheon	RKSIYPYX
		SAAE32	VDPP	PHNOM PENH	HH + 00		**BANGKOK**	VTBBYPYX
			VDSR	SIEM REAP	HH + 30		BRISBANE	YBBBYPYX
			VLVT	VIENTIANE (Wattay)			SINGAPORE	WSZZYPYM
			VYMD	MANDALAY INTERNATIONAL			TOKYO	RJTDYPYX
			VYNT	NAYPYITAW INTERNATIONAL			Collombo	VCCCYPYX
			VYYY	YANGON INTERNATIONAL			Delhi	VIDPYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYX
							Jakata	WIZZMCMC
							Kolkata	VECCYPYX
							Kuala Lumpur	WMZZYPYR
							Mumbai	VABYPYX
		SAAE33	VLLB	LUANG PRABANG	HH + 00	2300-1400	**BANGKOK**	VTBBYPYX
			VLLN	LUANG NAMTHA		2300-1400	BRISBANE	YBBBYPYX
			VLPS	PAKSE		2300-1400	SINGAPORE	WSZZYPYM
			VLSK	SAVANNAKHET		2300-1400	TOKYO	RJTDYPYX
		SAAE34	*VVCI*	*CAT BI*	HH + 00		**BANGKOK**	VTBBYPYX
			VVCR	KHANH HOA/Cam Ranh	HH + 30		BRISBANE	YBBBYPYX
			VVCT	CAN THO			SINGAPORE	WSZZYPYM
			VVDN	DA NANG			TOKYO	RJTDYPYX
			VVNB	HA NOI/Noi bai			Collombo	VCCCYPYX
			VVPB	HUE/Phu Bai			Delhi	VIDPYPYX
			VVPQ	KIEN GIANG/Phu Quoc			Hong Kong	VHZZYPYX
			VVTS	HO CHI MINH/Tan Son Nhat			Incheon	RKSIYPYX
							Jakata	WIZZMCMC
							Kolkata	VECCYPYX
							Kuala Lumpur	WMZZYPYR
							Mumbai	VABYPYX
		SATH31	*VTCH*	*MAE HONG SON*	HH + 00	0000-1100	**BANGKOK**	VTBBYPYX
			VTCL	*LAMPANG*		2300-1200	BRISBANE	YBBBYPYX
			VTCN	*NAN*		0000-1100	SINGAPORE	WSZZYPYM
			VTCP	*PHRAE*		0000-1100	TOKYO	RJTDYPYX
			VTPH	*PRACHUAP KHIRI KHAN/Hua Hin*		0000-1100		
			VTPO	*SUKHOTHAI*		2300-1400		
			VTPP	PHITSANULOK		2300-1400		
			VTPB	*PHETCHABUN*				
			VTPM	*TAK/Mae Sot*				
			VTBO	*TRAT/Khao Sming*		0000-1100		

Table A : Collection and Dissemination of METAR (SA) Bulletins

1		2			3	4	5	
ROC		**METAR Bulletin**			**Bul. Time**	**Available**	**DISSEMINATION TO**	
Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
		SATH32	VTSB	SURAT TANI	HH + 00	2300-1400	**BANGKOK**	VTBBYPYX
			VTSC	*NARATHIWAT*		0000-1100	BRISBANE	YBBBYPYX
			VTSE	*CHUMPHON/Tab Gai*			SINGAPORE	WSZZYPYM
			VTSF	*NAKHON SI THAMMARAT*		2300-1400	TOKYO	RJTDYPYX
			~~*VTSH*~~	~~*SONGKHLA*~~		~~0000-1100~~		
			~~*VTSK*~~	~~*PATTANI*~~				
			VTSM	*SURAT THANI/Samui*		2300-1400		
			VTSR	*RANONG*		2300-1300		
			VTST	*TRANG*		0000-1100		
		SATH33	*VTUD*	*UDON THANI*	HH + 00	2300-1400	**BANGKOK**	VTBBYPYX
			VTUI	*SAKON NAKHON/Ban Khai*		2200-1500	BRISBANE	YBBBYPYX
			VTUK	KHON KAEN		2300-1400	SINGAPORE	WSZZYPYM
			VTUL	*LOEI*		2300-1200	TOKYO	RJTDYPYX
			VTUO	*BURI RAM*		2200-1300		
			VTUQ	*NAKHON RATCHASIMA*		2300-1400		
			VTUV	*ROI ET*		2200-1400		
			VTUW	*NAKHON PHANOM*		0000-1400		
			~~*VTUJ*~~	~~*SURIN*~~				
			VTUU	UBON RATCHATHANI				
Beijing	**ZBBB**	**SACI31**	ZBAA	BEIJING/Capital	HH + 00		BANGKOK	VTBBYPYX
			ZBSJ	*SHIJIAZHUANG/Zhengding*	HH + 30		BRISBANE	YBBBYPYX
			ZBTJ	TIANJIN/Binhai			SINGAPORE	WSZZYPYM
			ZBYN	TAIYUAN/Wusu			**TOKYO**	RJTDYPYX
			ZGGG	GUANGZHOU/Baiyun			Hong Kong	VHZZYPYX
			ZSHC	HANGZHOU/Xiaoshan			Jakarta	WIZZMZBB
			ZSPD	SHANGHAI/Pudong			Karachi	OPZZYPYX
			ZSSS	SHANGHAI/Hongqiao			Mumbai	VABBYPYX
			ZWSH	KASHI/Kashi			Incheon	RKSIYPYX
			ZWWW	URUMQI/Diwopu			Ulaanbaatar	ZMUBYMYX
			ZYTL	DALIAN/Zhoushuizi				
			ZYTX	SHENYANG/Taoxian				
		SACI32	ZGKL	GUILIN/Liangjiang	HH + 00		BANGKOK	VTBBYPYX
			ZGNN	NANNING/Wuxu			BRISBANE	YBBBYPYX
			ZGOW	*SHANTOU/Waisha*			SINGAPORE	WSZZYPYM
			ZGSZ	SHENZHEN/Baoan			**TOKYO**	RJTDYPYX
			ZLXY	XI'AN/Xianyang			Hong Kong	VHZZYPYX
			ZMUB	ULAANBAATAR			Jakarta	WIZZMZBB
			ZPPP	KUNMING/Wujiaba			Kuala Lumpur	WMZZYPYX
			ZSAM	XIAMEN/Gaoqi			Incheon	RKSIYPYX
			ZSFZ	FUZHOU/Changle			Wellington	NZZZYPYX
			ZSNB	*NINGBO/Lishe*				
			ZSQD	QINGDAO/Liuting				
			ZUUU	CHENGDU/Shuangliu				
		SACI41	ZBHH	HOHHOT/Baita	HH + 00		BANGKOK	VTBBYPYX
			ZGHA	CHANGSHA/Huanghua			BRISBANE	YBBBYPYX
			ZHCC	*ZHENGZHOU/Xinzheng*			SINGAPORE	WSZZYPYM
			ZHHH	WUHAN/Tianhe			**TOKYO**	RJTDYPYX
			ZJHK	*HAIKOU/Meilan*			Hong Kong	VHZZYPYX
			ZJSY	SANYA/Phoenix			Jakarta	WIZZMZBB
			ZLLL	LANZHOU/Zhongchuan			Karachi	OPZZYPYX
			ZSNJ	NANJING/Lukou			Mumbai	VABBYPYX
			ZSOF	HEFEI/Luogang			Incheon	RKSIYPYX
			ZUCK	CHONGQING/Jiangbei			Ulaanbaatar	ZMUBYMYX

Table A : Collection and Dissemination of METAR (SA) Bulletins

1		2			3	4	5	
ROC		**METAR Bulletin**			**Bul. Time**	**Available**	**DISSEMINATION TO**	
Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
			ZYCC	*CHANGCHUN/Longjia*			Wellington	NZZZYPYX
			ZYHB	HARBIN/Taiping				
Brisbane	**YBBN**	**SAAU31**	YPAD	ADELAIDE/Adelaide Intl	HH + 00		BANGKOK	VTBBYPYX
			YBBN	BRISBANE/Brisbane Intl	HH + 30		**BRISBANE**	YBBBYPYX
			YBCS	CAIRNS/Cairns Intl			NADI	NFZZRFXX
			YSCB	*CANBERRA*			SINGAPORE	WSZZYPYX
			YPDN	DARWIN/Darwin Intl			TOKYO	RJTDYPYX
			YBCG	*GOLD COAST*			Beijing	ZBBBYPYX
			YMHB	HOBART			Hong Kong	VHZZYPYX
			YMML	MELBOURNE/Melbourne Intl			Incheon	RKSIYPYS
			YPPH	PERTH/Perth Intl			Jakarta	WIZZYPYX
			YSSY	SYDNEY/Sydney (Kingsford Smith) Intl			Manila	RPLLYPYX
							Mumbai	VABBYPYX
							Wellington	NZZZYPYX
		SAAU32	YBAS	ALICE SPRINGS	HH + 00		BANGKOK	VTBBYPYX
			YMAV	*AVALON*	HH + 30		**BRISBANE**	YBBBYPYX
			YBWW	Brisbane West Wellcamp			NADI	NFZZRFXX
			YBRM	BROOME/Broome Intl			SINGAPORE	WSZZYPYX
			YBLN	Busselton			TOKYO	RJTDYPYX
			~~YBCS~~	~~CAIRNS/Cairns Intl~~			Beijing	ZBBBYPYX
			~~*YSCB*~~	~~*CANBERRA*~~			Hong Kong	VHZZYPYX
			YPXM	CHRISTMAS ISLAND			Incheon	RKSIYPYS
			YPCC	COCOS (KEELING) ISLAND Intl			Jakarta	WIZZYPYX
			YCFS	*COFFS HARBOUR*			Manila	RPLLYPYX
			~~*YBCG*~~	~~*GOLD COAST*~~			Mumbai	VABBYPYX
			~~YMHB~~	~~HOBART~~			Wellington	NZZZYPYX
			YPKG	*KALGOORLIE-BOULDER*				
			YMLT	*LAUNCESTON*				
			YPLM	*LEARMONTH*				
			YLHI	*LORD HOWE ISLAND*				
			YSNF	NORFOLK ISLAND Intl				
			YPPD	PORT HEDLAND				
			YBRK	ROCKHAMPTON				
			~~YPTN~~	~~TINDAL~~				
			~~YBTL~~	~~TOWNSVILLE/Townsville Intl~~				
			~~*YWLM*~~	~~*WILLIAMTOWN*~~				
		SAAU33	~~*YAMB*~~	~~*AMBERLEY*~~	HH+00		BANGKOK	VTBBYPYX
			YGEL	*GERALDTON*	HH+30		**BRISBANE**	YBBBYPYX
			YGLA	*GLADSTONE*			NADI	NFZZRFXX
			YHID	*HORN ISLAND*			SINGAPORE	WSZZYPYX
			~~*YPEA*~~	~~*PEARCE*~~			TOKYO	RJTDYPYX
			YPJT	*PERTH/Jandakot*			Beijing	ZBBBYPYX
			YPWR	*WOOMERA*			Hong Kong	VHZZYPYX
			YSDU	*DUBBO*			Incheon	RKSIYPYS
			YSRI	*RICHMOND, NSW*			Jakarta	WIZZYPYX
			YSTW	*TAMWORTH*			Manila	RPLLYPYX
							Mumbai	VABBYPYX
							Wellington	NZZZYPYX
		SAAU34	*YBHM*	*HAMILTON ISLAND*	HH+00		BANGKOK	VTBBYPYX
			YBMA	*MOUNT ISA*	HH+30		**BRISBANE**	YBBBYPYX

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1		2			3	4	5	
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Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
							NADI	NFZZRFXX
							SINGAPORE	WSZZYPYX
							TOKYO	RJTDYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYS
							Jakarta	WIZZYPYX
							Wellington	NZZZYPYX
		SAAU35	*YCIN*	*CURTIN*	HH+00		BANGKOK	VTBBYPYX
			YFRT	*FORREST*	HH+30		**BRISBANE**	YBBBYPYX
			YPKU	*KUNUNURRA*			NADI	NFZZRFXX
			YPGV	*GOVE*			SINGAPORE	WSZZYPYX
							TOKYO	RJTDYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYS
							Jakarta	WIZZYPYX
							Wellington	NZZZYPYX
		SAAU36	*YAMB*	*AMBERLEY*	HH + 00		BANGKOK	VTBBYPYX
			YPEA	*PEARCE*	HH + 30		**BRISBANE**	YBBBYPYX
			YPTN	TINDAL			NADI	NFZZRFXX
			YBTL	TOWNSVILLE/Townsville Intl			SINGAPORE	WSZZYPYX
			YWLM	*WILLIAMTOWN*			TOKYO	RJTDYPYX
							Beijing	ZBBBYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYS
							Jakarta	WIZZYPYX
							Manila	RPLLYPYX
							Mumbai	VABBYPYX
							Wellington	NZZZYPYX
		SANG31	AYPY	PORT MORESBY Intl	HH+00		BANGKOK	VTBBYPYX
			AYWK	*WEWAK*		NR	**BRISBANE**	YBBBYPYX
			AYVN	VANIMO		NR	NADI	NFFNYPYX
			AYNZ	*NADZAB*		NR	SINGAPORE	WSZZYPYM
			AYMH	*MOUNT HAGEN*		NR	TOKYO	RJTDYPYX
			AYGN	*GURNEY*		NR	Beijing	ZBBBYPYX
			AYMO	*MOMOTE*		NR	Hong Kong	VHZZYPYX
			ANYN	NAURU I.			Jakarta	WIZZMIMI
			AGGH	HONIARA (HENDERSON)			Wellington	NZZZYPYX
Colombo	**VCCC**	**SASB31**	VCBI	BANDARANAIKE INTL AP COLOMBO	HH + 10		**BANGKOK**	VTBBYPYX
			VCRI	MATTALA RAJAPAKSA INTERNATIONAL AIRPORT			BRISBANE	YBBBYPYX
			VCCH	HINGURAKGODA/MINNERIYA			SINGAPORE	WSZZYPYM
		SAMV31	VRMG	GAN INTERNATIONAL AIRPORT			TOKYO	RJTDYPYX
			VRMH	HANIMAADHOO INTERNATIONAL AIRPORT			Hong Kong	VHZZYPYX
			VRMM	MALE INTERNATIONAL AIRPORT			Kuala Lumpur	WMZZYPYR
							Mumbai	VABBYPYX
Delhi	**VIDP**	**SAIN32**	VIDP	DELHI/Indira Gandhi Intl	HH + 00		**BANGKOK**	VTBBYPYX
			VILK	LUCKNOW	HH + 30		BRISBANE	YBBBYPYX
			VIAR	AMRITSAR			SINGAPORE	WSZZYPYM
			VEBN	VARANASI			TOKYO	RJTDYPYX
			VIJP	JAIPUR			Kolkata	VECCYPYX
							Hong Kong	VHZZYPYX

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1		2			3	4	5	
ROC		**METAR Bulletin**			**Bul. Time**	**Available**	**DISSEMINATION TO**	
Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
							Karachi	OPZZYPYX
							Mumbai	VABBYPYX
Hong Kong	**VHHH**	**SAHK31**	VHHH	HONG KONG/International	HH + 00		BANGKOK	VTBBYPYX
			RCTP	TAIBEI CITY/Taibei Intl Ap	HH + 30		BRISBANE	YBBBYPYX
			RCKH	GAOXIONG			SINGAPORE	WSZZYPYM
			RCSS	TABEI/Songshan			**TOKYO**	RJTDYPYX
			RCMQ	TAICHUNG/Qingquangang			Beijing	ZBBBYPYX
			RCNN	TAINAN			Kuala Lumpur	WMZZYPYR
			RCFN	TAIDONG/Fengnian		2200-1200	Incheon	RKSIYPYX
			VMMC	MACAO/Intl Airport			Wellington	NZZZYPYX
			RPLL	MANILA/Ninoy Aquino Intl				
			RPVM	LAPU-LAPU/Mactan-Cebu				
			RPMD	DAVAO/Francisco Bangoy Intl		2200-1000		
			RPLB	SUBIC BAY, Subic Bay Intl				
			RPLI	LAOAG, Laoag Intl		2200-1000		
			RPMZ	ZAMBOANGA, Zamboanga Intl		2200-1000		
Incheon	**RKSI**	**SAKO31**	RKSI	INCHEON	HH + 00		BANGKOK	VTBBYPYX
			RKSS	GIMPO	HH + 30		BRISBANE	YBBBYPYX
			RKPC	JEJU			SINGAPORE	WSZZYPYM
			RKPK	GIMHAE			**TOKYO**	RJTDYPYX
			RKTU	CHEONGJU			Beijing	ZBBBYPYX
			RKNY	YANGYANG			Hong Kong	VHZZYPYX
			RKTN	DAEGU			Singapore	WSZZYPYM
			RKJB	MUAN			Tokyo	RJTDYPYX
							Wellington	NZZZYPYX
							Mumbai	VABBYPYX
Jakarta	**WIII**	**SAID31**	WAAA	UJUNG PANDANG/Hasanuddin	HH + 00		BANGKOK	VTBBYPYX
			WABB	BIAK/Frans Kaisiepo	HH + 30		BRISBANE	YBBBYPYX
			WIHH	JAKARTA/Halimperdana Kusuma		2200-1700	**SINGAPORE**	WSZZYPYM
			WIII	JAKARTA/Soekarno Hatta (COMM CENTER)			TOKYO	RJTDYPYX
			WIDD	BATAM/Hang Nadim			Hong Kong	VHZZYPYX
			WIMM	MEDAN/Polonia			Kuala Lumpur	WMZZYPYR
			WADD	BALI/Ngurah Rai			Wellington	NZZZYPYX
			WARR	SURABAYA/Juanda				
		SAID32	WAMM	MANADO/Sam Ratulangi	HH + 00		BANGKOK	VTBBYPYX
			WIBB	PEKANBARU/Sultan Syarif Kasim II	HH + 30		BRISBANE	YBBBYPYX
			WIDN	TANJUNG PINANG/Kijang		2200-0500	**SINGAPORE**	WSZZYPYM
			WIEE	PANDANG/MINANGKABAU			TOKYO	RJTDYPYX
			WIOO	PONTIANAK/Supadio			Hong Kong	VHZZYPYX
			WIPP	PALEMBANG/Sultan Mahmud Badaruddin II			Kuala Lumpur	WMZZYPYR
			WAOO	BANJARMASIN/Syamsuddin Noor			Wellington	NZZZYPYX
			WALL	BALIK PAPAN/Sepinggan				
			WADL	*PRAYA/LOMBOK INTERNATIONAL*				
		SAID33	WAYY	TIMIKA/Moses Kilangin	HH + 00	2100-0800	BANGKOK	VTBBYPYX
			WAJJ	JAYAPURA/Sentani	HH + 30		BRISBANE	YBBBYPYX
			WAKK	MERAUKE/Mopah		2200-0500	**SINGAPORE**	WSZZYPYM
			WAPP	AMBON/Pattimura			TOKYO	RJTDYPYX
			WAHS	*SEMARANG/A.Yani*			Hong Kong	VHZZYPYX
			WILL	*BANDAR LAMPUNG/Radin Inten*			Kuala Lumpur	WMZZYPYR
			WATT	KUPANG/El Tari			Wellington	NZZZYPYX

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ROC		**METAR Bulletin**			**Bul. Time**	**Available**	**DISSEMINATION TO**	
Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
			WAQQ	TARAKAN/Juwata		2000-1300		
Kolkata	**VECC**	**SAIN33**	VECC	NETAJI SUBHASH CHANDRA BOSE INTERNATIONAL AIRPORT, KOLKATA	HH + 00		**BANGKOK**	VTBBYPYX
			VEPT	PATNA	HH + 30		BRISBANE	YBBBYPYX
			VEGY	GAYA			SINGAPORE	WSZZYPYM
			VEGT	GUWAHATI			TOKYO	RJTDYPYX
		SABW31	VGEG	M.A. HANNAN INTL. CHITTAGONG			Colombo	VCCCYPYX
			VGHS	HAZRAT SHAHJALAL INTERNATIONAL AIRPORT			Delhi	VIDPYPYX
			VGSY	*OSMANI INTERNATIONAL AIRPORT,SYLHET*			Hong Kong	VHZZYPYX
		SAAS31	VNKT	KATHMANDU			Karachi	OPZZYPYX
			VQPR	PARO/Intl.			Mumbai	VABBYPYX
Karachi	**OPKC**	**SAPK31**	OPKC	KARACHI/Jinnah Int'l	HH + 00		**BANGKOK**	VTBBYPYX
			OPRN	ISLAMABAD/Chaklala	HH + 30		BRISBANE	YBBBYPYX
			OPLA	LAHORE/Allama Iqbal Int'l			SINGAPORE	WSZZYPYM
			OPNH	NAWABSHAH			TOKYO	RJTDYPYX
			OPGD	GWADAR			Abu Dhabi	OMZZYPYX
			OPPS	PESHAWAR			Bahrain	OBZZYPYX
			OPSK	*SUKKUR*			Beijing	ZBBBYPYX
							Kolkata	VECCYPYX
							Delhi	VIDDYPYX
							Hong Kong	VHZZYPYX
							Mumbai	VABBYPYX
							Tehran	OIZZYPYX
Kuala Lumpur	**WMKK**	**SAMS31**	WBGG	KUCHING/Intl	HH + 00		BANGKOK	VTBBYPYX
			WBKK	KOTA KINABALU/Intl	HH + 30		BRISBANE	YBBBYPYX
			WBSB	BRUNEI/Intl			**SINGAPORE**	WSZZYPYM
			WMKK	SEPANG/KL International Airport			TOKYO	RJTDYPYX
			WMKP	PENANG/Intl			Colombo	VCCCYPYX
			WSSS	SINGAPORE/Changi			Hong Kong	VHZZYPYX
			WSSL	SELETAR			Jakarta	WIZZMBMB
							Manila	RPLLYPYX
							Mumbai	VABBYPYX
							Incheon	RKSIYPYX
							Wellington	NZZZYPYX
		SAMS38	*WBGB*	*BINTULU*	HH + 00		BANGKOK	VTBBYPYX
			WBGR	*MIRI*			BRISBANE	YBBBYPYX
			WBGS	*SIBU*			**SINGAPORE**	WSZZYPYM
			WBKL	*LABUAN*			TOKYO	RJTDYPYX
			WBKS	*SANDAKAN*			Colombo	VCCCYPYX
			WBKW	*TAWAU*			Hong Kong	VHZZYPYX
			WMKD	*KUANTAN*			Jakarta	WIZZMBMB
			WMKL	PULAU LANGKAWI/Intl			Manila	RPLLYPYX
			WMKM	*MALACCA*			Mumbai	VABBYPYX
							Incheon	RKSIYPYX
							Wellington	NZZZYPYX
Mumbai	**VABB**	**SAIN31**	VAAH	AHMEDABAD	HH + 00		**BANGKOK**	VTBBYPYX
			VABB	MUMBAI/Chhatrapati Shivaji Intl.	HH + 30		BRISBANE	YBBBYPYX
			VANP	NAGPUR			SINGAPORE	WSZZYPYM
			VOMM	CHENNAI			TOKYO	RJTDYPYX
			VOTR	TIRUCHCHIRAPPALLI			Abu Dhabi	OMZZYPYX

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Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
			VOTV	TRIVANDRUM			Bahrain	OBZZYPYX
			VOHS	HYDERABAD			Colombo	VCCCYPYX
			VOBL	BANGALORE INTL APT			Delhi	VIDPYPYX
			VOCL	CALICUT			Hong Kong	VHZZYPYX
			VOCI	COCHIN INTERNATIONAL			Karachi	OPZZYPYX
			VOCB	COIMBATORE			Kolkata	VECCYPYX
			VOML	MANGALORE			Tehran	OIZZYPYX
Nadi	**NFFN**	**SAPS31**	NCRG	RAROTONGA Intl.	HH+00		**BANGKOK**	VTBBYPYX
			NFFN	NADI/Intl			BRISBANE	YBBBYPYX
			NFNA	*NAUSORI/Intl*			NADI	NFFNYPYX
			NFTF	FUA'AMOTU INTL.			SINGAPORE	WSZZYPYM
			NFTV	VAVA'U			TOKYO	RJTDYPYX
			NGFU	FUNAFUTI/Intl			Wellington	NZZZYPYX
			NGTA	TARAWA/Bonriki Intl				
			NIUE	NIUE Intl				
			NLWW	WALLIS HIHIFO				
			NSFA	FALEOLO/Intl				
			NSTU	PAGO PAGO Intl, Tutuila I.				
			NTAA	TAHITI FAAA				
			NVSS	SANTO/Pekoa				
			NVVV	PORT VILA/Bauerfield				
			NWWW	NOUMEA LA TANTOUTA				
			PLCH	CHRISTMAS ISLAND				
		SAPS32	*NFTL*	*HA'APAI*	HH+00		**BANGKOK**	VTBBYPYX
							BRISBANE	YBBBYPYX
							NADI	NFFNYPYX
							SINGAPORE	WSZZYPYM
							TOKYO	RJTDYPYX
							Wellington	NZZZYPYX
Tokyo	**RJTD**	**SAJP31**	RJAA	NARITA Intl	HH + 00		BANGKOK	VTBBYPYX
			RJBB	KANSAI Intl			BRISBANE	YBBBYPYX
			RJCH	HAKODATE			NADI	NFFNYPYX
			RJGG	CHUBU CENTRAIR Intl			SINGAPORE	WSZZYPYM
			RJOO	OSAKA Intl			**TOKYO**	RJTDYPYX
			RJSS	SENDAI			Beijing	ZBBBYPYX
			RJTT	TOKYO Intl			Guam	PGUMCOAX
			ROAH	NAHA			Hong Kong	VHZZYPYX
							Incheon	RKSIYPYX
							London	EGZZMASI
							Wellington	NZZZYPYX
		SAJP32	RJCC	SAPPORO/New Chitose	HH + 00		BANGKOK	VTBBYPYX
			RJFF	FUKUOKA			BRISBANE	YBBBYPYX
			RJFK	KAGOSHIMA			NADI	NFFNYPYX
			RJFU	NAGASAKI			SINGAPORE	WSZZYPYM
			RJOA	HIROSHIMA			**TOKYO**	RJTDYPYX
			RJFT	KUMAMOTO			Beijing	ZBBBYPYX
			RJSN	NIIGATA			Guam	PGUMCOAX
			RJFO	OITA			Hong Kong	VHZZYPYX
			RJOB	OKAYAMA			Incheon	RKSIYPYX
			RJOT	TAKAMATSU			London	EGZZMASI
			RJNK	*KANAZAWA/Komatsu*			Wellington	NZZZYPYX
			RJNT	*TOYAMA*				
		SAJP38	*RJCK*	*KUSHIRO*	HH + 00		BANGKOK	VTBBYPYX
			RJCM	*MEMANBETSU*			BRISBANE	YBBBYPYX

Table A : Collection and Dissemination of METAR (SA) Bulletins

1		2			3	4	5	
ROC		**METAR Bulletin**			**Bul. Time**	**Available**	**DISSEMINATION TO**	
Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
			RJCB	*OBIHIRO*			NADI	NFFNYPYX
			RJOC	*IZUMO*			SINGAPORE	WSZZYPYM
			RJOH	*MIHO*			**TOKYO**	RJTDYPYX
			RJOK	*KOCHI*			Beijing	ZBBBYPYX
			RJFM	*MIYAZAKI*			Brasilia	SBBRYZYX
			ROIG	*ISHIGAKI JIMA*			Hong Kong	VHZZYPYX
			RJNS	*SHIZUOKA*			Incheon	RKSIYPYX
			RJSA	*AOMORI*			London	EGZZMASI
			RJSF	*FUKUSHIMA*			Rayong	VTBUYMYX
			RJOM	*MATSUYAMA*				
			RJEC	*ASAHIKAWA*				
			RJSK	*AKITA*				
			RJAH	*HYAKURI*				
			RJFR	*NEW KITAKYUSHU*				
			RJFS	*SAGA*				
Wellington	**NZKL**	**SANZ31**	NZWN	WELLINGTON Intl	HH + 00		BANGKOK	VTBBYPYX
			NZAA	AUCKLAND Intl	HH + 30		**BRISBANE**	YBBBYPYX
			NZCH	CHRISTCHURCH Intl			SINGAPORE	WSZZYPYM
		SANZ32	*NZQN*	*QUEENSTOWN*	*HH + 00*		TOKYO	RJTDYPYX
					HH + 30		NADI	NFFNYPYX
							Beijing	ZBBBYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYX
							Jakarta	WIZZYPYX

APPENDIX B - Collection and Dissemination of TAF (FT) Bulletins

Table B : FT TAF

Explanation of the Table

Col. 1: Name and ICAO location indicator of the ROC compiling the bulletin

Col. 2: Description of the TAF Bulletin

Col. 3: Dissemination of the bulletin to other ROCs and RODBs

Notes:

1 *The RODB responsible for storing the bulletin is in **bold.***

2 *The TAF filing time should be not earlier than 1 hour before the start of the period of validity.*

3 *TAF that do not meet 24- and 30-hour IATA requirements are indicated in the TAF validity column with the required validity shown in parenthesis.*

4 *TAF included in VOLMET broadcasts are listed in APAC, ANP, VOL II, Table MET II-3, VOLMET Broadcasts.*

5 *Aerodromes not listed in Table AOP 1 are indicated in italics.*

Table B : Collection and Dissemination of TAF (FT) Bulletins

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
ASIA/PAC REGION									
Bangkok	**VTBB**	**FTAE31**	VTBD	BANGKOK/Don Mueang Intl Airport	0535	0600	30	**BANGKOK**	VTBBYPYX
			VTBS	BANGKOK/Suvarnabhumi Intl Airport	1135	1200	30	BRISBANE	YBBBYPYX
			VTBU	RAYONG/U-Tapao Intl	1735	1800	24	SINGAPORE	WSZZYPYX
			VTCC	CHIANG MAI/Chiang Mai Intl. Airport	2335	0000	30	TOKYO	RJTDYPYX
			VTCT	CHIANG RAI/Chiang Rai Intl Apt			24	Abu Dhabi	OMZZYPYX
			VTSG	KRABI			30	Bahrain	OBZZYPYX
			VTSP	PHUKET/Phuket Intl			30	Beijing	ZBBBYPYX
			VTSS	SONGKHLA/Hat Yai Intl			24	Beirut	OLLLYPYX
								Hong Kong	VHZZYPYX
								Jeddah	OEJDYPYX
								Karachi	OPZZYPYX
								Kuala Lumpur	WMZZYPYR
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPYA
		FTAE32	VDPP	PHNOM PENH	0535	0600	18 (24)	**BANGKOK**	VTBBYPYX
			VDSR	SIEM REAP	1135	1200	18 (24)	BRISBANE	YBBBYPYX
			VGHS	HAZRAT SHAHJALAL INTL APT	1735	1800	30	SINGAPORE	WSZZYPYX
			VLVT	VIENTIANE (Wattay)	2335	0000	24	TOKYO	RJTDYPYX
			VYMD	*MANDALAY INTERNATIONAL**			24	Bahrain	OBZZYPYX
			VYNT	*NAYPYITAW INTERNATIONAL*			24	Beijing	ZBBBYPYX
			VYYY	YANGON INTERNATIONAL			24	Beirut	OLLLYPYX
								Hong Kong	VHZZYPYX
							-	Jeddah	OEJDYPYX
				*Issued 0500/1100				Karachi	OPZZYPYX
								Kuala Lumpur	WMZZYPYR
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPYA
		FTAE33	*VLLB*	*LUANG PRABANG*	0535	0600	18	**BANGKOK**	VTBBYPYX
			VLLN	*LUANG NAMTHA*	1135	1200	18	BRISBANE	YBBBYPYX
			VLPS	*PAKSE*	2335	0000	18	SINGAPORE	WSZZYPYX
			VLSK	*SAVANNAKHET*			18	TOKYO	RJTDYPYX
								Bahrain	OBZZYPYX
								Beijing	ZBBBYPYX
								Beirut	OLLLYPYX
								Hong Kong	VHZZYPYX
								Jeddah	OEJDYPYX
								Karachi	OPZZYPYX
								Kuala Lumpur	WMZZYPYR
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPYA
		FTAE34	*VVCI*	*CAT BI*	0535	0600	24	**BANGKOK**	VTBBYPYX
			VVCR	KHANH HOA/Cam Ranh Int'l	1135	1200	30	BRISBANE	YBBBYPYX
			VVCT	CAN THO/Can Tho Int'l	1735	1800	24	SINGAPORE	WSZZYPYX
			VVDN	DA NANG	2335	0000	24	TOKYO	RJTDYPYX
			VVNB	HA NOI/Noi Bai			24	Abu Dhabi	OMZZYPYX
			VVPB	HUE/Phu Bai			24	Bahrain	OBZZYPYX
			VVPQ	KIEN GIANG/Phu Quoc Int'l			24	Beijing	ZBBBYPYX
			VVTS	HO CHI MINH/Tan Son Nhat			24	Beirut	OLLLYPYX
								Hong Kong	VHZZYPYX
								Jeddah	OEJDYPYX
								Karachi	OPZZYPYX
								Kuala Lumpur	WMZZYPYR
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZYPYA
		FTTH31	*VTBO*	*TRAT/Khao Sming*	0535	0600	24	**BANGKOK**	VTBBYPYX
			VTCH	*MAE HONG SON*	1135	1200	24	BRISBANE	YBBBYPYX
			VTCL	*LAMPANG*	1735	1800	24	SINGAPORE	WSZZYPYX

Table B : Collection and Dissemination of TAF (FT) Bulletins

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			VTCN	*NAN*	2335	0000	24	TOKYO	RJTDYPYX
			VTCP	*PHRAE*			24		
			VTPB	*PHETCHABUN*			24		
			VTPH	*PRACHUAP KHIRI KHAN/Hua Hin*			24		
			VTPM	*TAK/MAE SOT*			24		
			VTPO	*SUKHOTHAI*			24		
			VTPP	PHITSANULOK			24		
			VTPT	*TAK*			24		
		FTTH32	VTSB	SURAT THANI	0535	0600	24	**BANGKOK**	VTBBYPYX
			VTSC	*NARATHIWAT*	1135	1200	24	BRISBANE	YBBBYPYX
			VTSE	*CHUMPHON/Tab Gai*	1735	1800	24	SINGAPORE	WSZZYPYX
			VTSF	*NAKHON SI THAMMARAT*	2335	0000	24	TOKYO	RJTDYPYX
			~~*VTSH*~~	~~*SONGKHLA*~~			~~24~~		
			~~*VTSK*~~	~~*PATTANI*~~			~~24~~		
			VTSM	*SURAT THANI/Samui*			24		
			VTSR	*RANONG*			24		
			VTST	*TRANG*			24		
		FTTH33	*VTUD*	*UDON THANI*	0535	0600	24	**BANGKOK**	VTBBYPYX
			VTUI	*SAKON NAKHON/Ban Khai*	1135	1200	24	BRISBANE	YBBBYPYX
			~~*VTUJ*~~	~~*SURIN*~~	1735	1800	24	SINGAPORE	WSZZYPYX
			VTUK	KHON KAEN	2335	0000	24	TOKYO	RJTDYPYX
			VTUL	*LOEI*			24		
			VTUO	*BURI RAM*			24		
			VTUQ	*NAKHON RATCHASIMA*			24		
			VTUU	UBON RATCHATHANI			24		
			VTUV	*ROI ET*			24		
			VTUW	*NAKHON PHANOM*			24		
Beijing	**ZBBB**	**FTCI31**	ZBAA	BEIJING/Capital	0535	0600	30	BANGKOK	VTBBYPYX
			ZBSJ	*SHIJIAZHUANG/Zhengding*	1135	1200	24	BRISBANE	YBBBYPYX
			ZBTJ	TIANJIN/Binhai	1735	1800	24 (30)	SINGAPORE	WSZZYPYX
			ZBYN	TAIYUAN/Wusu	2335	0000	24	**TOKYO**	RJTDYPYX
			ZGGG	GUANGZHOU/Baiyun			30	Hong Kong	VHZZYPYX
			ZSHC	HANGZHOU/Xiaoshan			24	Karachi	OPZZYPYX
			ZSPD	SHANGHAI/Pu Dong			30	Mumbai	VABBYPYX
			ZSSS	SHANGHAI/Hongqiao			24	Incheon	RKSIYPYX
			ZWSH	KASHI/Kashi			24 (30)	Ulan Bator	ZMUBYMYX
			ZWWW	URUMQI/Diwopu			24 (30)	Wellington	NZZZYPYA
			ZYTL	DALIAN/Zhoushuizi			24		
			ZYTX	SHENYANG/Taoxian			24		
		FTCI32	ZGKL	GUILIN/Lianjiang	0535	0600	24	BANGKOK	VTBBYPYX
			ZGNN	NANNING/Wuxu	1135	1200	24	BRISBANE	YBBBYPYX
			ZGOW	*SHANTOU/Waisha*	1735	1800	24	SINGAPORE	WSZZYPYX
			ZGSZ	SHENZHEN/Baoan	2335	0000	24 (30)	**TOKYO**	RJTDYPYX
			ZLXY	XI'AN/Xianyang			24	Hong Kong	VHZZYPYX
			ZMUB	ULAANBAATAR			30	Jakarta	WIZZYPYX
			ZPPP	KUNMING/Wujiaba			24 (30)	Karachi	OPZZYPYX
			ZSAM	XIAMEN/Gaoqi			24	Kuala Lumpur	WMZZYPYR
			ZSFZ	FUZHOU/Changle			24	Mumbai	VABBYPYX
			ZSNB	*NINGBO/Lishe*			24	Wellington	NZZZYPYA
			ZSQD	QINGDAO/Liuting			24		
			ZUUU	CHENGDU/Shuangliu			24		
		FTCI41	ZBHH	HUHHOT/Baita	0535	0600	24	BANGKOK	VTBBYPYX
			ZGHA	CHANGSHA/Huanghua	1135	1200	24	BRISBANE	YBBBYPYX
			ZHCC	*ZHENGZHOU/Xinzheng*	1735	1800	24	SINGAPORE	WSZZYPYX
			ZHHH	WUHAN/Tianhe	2335	0000	24	**TOKYO**	RJTDYPYX
			ZJHK	*HAIKOU/Meilan*			24 (30)	Hong Kong	VHZZYPYX
			ZJSY	SANYA/Phoenix			24	Jakarta	WIZZYPYX
			ZLLL	LANZHOU/Zhongchuan			24	Karachi	OPZZYPYX
			ZSNJ	NANJING/Lukou			24	Mumbai	VABBYPYX
			ZSOF	HEFEI/Luogang			24	Incheon	RKSIYPYX
			ZUCK	CHONGQING/Jiangbei			24	Ulan Bator	ZMUBYMYX
			ZYCC	*CHANGCHUN/Longjia*			24	Wellington	NZZZYPYX
			ZYHB	HARBIN/Taiping			24		
Brisbane	**YBBN**	**FTAU31**	YPAD	ADELAIDE/Adelaide Intl	0235	0300	30	BANGKOK	VTBBYPYX
			YBBN	BRISBANE/Brisbane Intl	0535	0600	30	**BRISBANE**	YBBBYPYX
			YBCS	CAIRNS/Cairns Intl	0835	0900	24	NADI	NFZZRFXX
			YSCB	*CANBERRA*	1135	1200	24	SINGAPORE	WSZZYPYX
			YPDN	DARWIN/Darwin Intl	1435	1500	30	TOKYO	RJTDYPYX
			YBCG	*GOLD COAST*	1735	1800	24	Beijing	ZBBBYPYX

Table B : Collection and Dissemination of TAF (FT) Bulletins

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			YMHB	HOBART	2035	2100	24	Hong Kong	VHZZYPYX
			YMML	MELBOURNE/Melbourne Intl	2335	0000	30	Jakarta	WIZZYPYX
			YPPH	PERTH/Perth Intl			30	Manila	RPLLYPYX
			YSSY	SYDNEY/Sydney (Kingsford Smith) Intl			30	Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU32	YBAS	ALICE SPRINGS	0535	0600	24	BANGKOK	VTBBYPYX
			YMAV	*AVALON*	1135	1200	24	**BRISBANE**	YBBBYPYX
			YBWW	Brisbane West Wellcamp	1735	1800	24	NADI	NFZZRFXX
			YBRM	*BROOME/Broome Intl*	2335	0000	24	SINGAPORE	WSZZYPYX
			YBLN	Busselton			24	TOKYO	RJTDYPYX
			~~YBCS~~	~~CAIRNS/Cairns Intl~~			~~24~~	Beijing	ZBBBYPYX
			~~*YSCB*~~	~~*CANBERRA*~~			~~24~~	Hong Kong	VHZZYPYX
			YPXM	CHRISTMAS ISLAND			24	Jakarta	WIZZYPYX
			YPCC	COCOS (KEELING) ISLAND Intl			24	Manila	RPLLYPYX
			YCFS	*COFFS HARBOUR*			24	Mumbai	VABBYPYX
			~~*YBCG*~~	~~*GOLD COAST*~~			~~24~~	Wellington	NZZZYPYX
			~~YMHB~~	~~HOBART~~			~~24~~		
			YPKG	*KALGOORLIE-BOULDER*			24		
			YMLT	*LAUNCESTON*			24		
			YPLM	*LEARMONTH*			24		
			YLHI	*LORD HOWE ISLAND*			24		
			YSNF	NORFOLK ISLAND Intl			24		
			YPPD	PORT HEDLAND			24		
			YBRK	ROCKHAMPTON			24		
			~~YPTN~~	~~TINDAL~~			~~24~~		
			~~YBTL~~	~~TOWNSVILLE/Townsville Intl~~			~~24~~		
			~~*YWLM*~~	~~*WILLIAMTOWN*~~			~~24~~		
		FTAU33	~~*YAMB*~~	~~*AMBERLEY*~~	0535	0600	18	BANGKOK	VTBBYPYX
			YSDU	*DUBBO*	1135	1200	18	**BRISBANE**	YBBBYPYX
			YGEL	*GERALDTON*	1735	1800	18	NADI	NFZZRFXX
			YGLA	*GLADSTONE*	2335	0000	18	SINGAPORE	WSZZYPYX
			YHID	*HORN ISLAND*			18	TOKYO	RJTDYPYX
			~~*YPEA*~~	~~*PEARCE*~~			18	Beijing	ZBBBYPYX
			YPJT	*PERTH/Jandakot*			18	Hong Kong	VHZZYPYX
			YSRI	*RICHMOND, NSW*			18	Jakarta	WIZZYPYX
			YSTW	*TAMWORTH*			18	Manila	RPLLYPYX
			YPWR	*WOOMERA*			18	Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU34	*YBHM*	*HAMILTON ISLAND*	0500	0600	12	BANGKOK	VTBBYPYX
			YBMA	*MOUNT ISA*	1100	1200	12	**BRISBANE**	YBBBYPYX
					1700	1800		NADI	NFZZRFXX
					2300	0000		SINGAPORE	WSZZYPYX
								TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU35	*YCIN*	*CURTIN*	0100	0200	12	BANGKOK	VTBBYPYX
			YFRT	*FORREST*	0700	0800	12	**BRISBANE**	YBBBYPYX
			YPGV	*GOVE*	1300	1400	12	NADI	NFZZRFXX
			YPKU	*KUNUNURRA*	1900	2000	12	SINGAPORE	WSZZYPYX
								TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU36	*YAMB*	*AMBERLEY*	0235 (M-F)	0300 (M-F)	24	BANGKOK	VTBBYPYX
			YPEA	*PEARCE*	0535	0600	18	**BRISBANE**	YBBBYPYX
			YPTN	TINDAL	1135	1200	24	NADI	NFZZRFXX
			YBTL	TOWNSVILLE/Townsville Intl	1735	1800	24	SINGAPORE	WSZZYPYX
			YWLM	*WILLIAMTOWN*	2035 (M-F)	2100 (M-F)	24	TOKYO	RJTDYPYX
					2335	0000		Beijing	ZBBBYPYX

Table B : Collection and Dissemination of TAF (FT) Bulletins

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTTM31	*WPDL*	*DILI/Presidente Nicolau Lobato Intl*	0535	0600	12	BANGKOK	VTBBYPYX
			~~WPDB~~	~~*SUAI **~~	1135	1200		**BRISBANE**	YBBBYPYX
					1735	1800		NADI	NFZZRFXX
					2335	0000		SINGAPORE	WSZZYPYX
				~~* Note: Filing/Start: 2335/0000 & 1735/1800 only~~				TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTNG31	AYPY	PORT MORESBY Intl	0535	0600	24	BANGKOK	VTBBYPYX
			AYWK	*WEWAK*	1135	1200	24	**BRISBANE**	YBBBYPYX
			AYVN	VANIMO	1735	1800	24	NADI	NFZZRFXX
			AYNZ	*NADZAB*	2335	0000	24	SINGAPORE	WSZZYPYX
			AYMH	*MOUNT HAGEN*			24	TOKYO	RJTDYPYX
			AYMO	*MOMOTE*			24	Beijing	ZBBBYPYX
			ANYN	NAURU I.			24	Hong Kong	VHZZYPYX
			AGGH	HONIARA (HENDERSON)			24	Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
Hong Kong	**VHHH**	**FTHK31**	VHHH	HONG KONG/International	0535	0600	30	BANGKOK	VTBBYPYX
			RCTP	TAIBEI CITY/Taibei Intl Ap	1135	1200	30	BRISBANE	YBBBYPYX
			RCKH	GAOXIONG	1735	1800	30	NADI	NFFNYMYX
			RCSS	TAIBEI/Songshan	2335	0000	24	SINGAPORE	WSZZYPYX
			RCMQ	TAICHUNG/Qingquangang			24	**TOKYO**	RJTDYPYX
			RCNN	TAINAN			24	Beijing	ZBBBYPYX
			RCFN	TAIDONG/Fengnian			24	Mumbai	VABBYPYX
			VMMC	MACAOU/Intl Airport			30	Incheon	RKSIYPYX
			RPLL	MANILA/Ninoy Aquino Intl, Pasay City, Metro Manila			30	Wellington	NZZZYPYA
			RPVM	LAPU-LAPU/Mactan, Cebu			30	London	EGZZMASI
			RPMD	DAVAO/Francisco Bangoy Intl, Davao Del Sur			24	Washington	KWBCYMYX
			RPLB	SUBIC BAY, Subic Bay Intl, Olongapo City, Zambales			24		
			RPMZ	ZAMBOANGA, Zamboanga Intl, Zamboanga Del Norte			24		
			RPLI	LAOAG, Laoag Intl, Ilocos Norte			24		
Incheon	**RKSI**	**FTKO31**	RKSI	INCHEON Intl	0535	0600	30	BANGKOK	VTBBYPYX
			RKSS	GIMPO Intl	1135	1200	30	BRISBANE	YBBBYPYX
			RKPC	JEJU Intl	1735	1800	30	SINGAPORE	WSZZYPYX
			RKPK	GIMHAE Intl	2335	0000	30	**TOKYO**	RJTDYPYX
			RKTU	CHEONGJU Intl			30	Hong Kong	VHZZYPYX
			RKNY	YANGYANG Intl			30	Karachi	OPZZYPYX
			RKTN	DAEGU INTL			30	Wellington	NZZZYPYX
			RKJB	MUAN Intl			30		
Karachi	**OPKC**	**FTPK31**	OPKC	KARACHI/Jinnah Intl	0535	0600	30	**BANGKOK**	VTBBYPYX
			OPRN	ISLAMABAD/Chaklala	1135	1200	30	BRISBANE	YBBBYPYX
			OPLA	LAHORE/Allama Iqbal Int'l	1735	1800	30	SINGAPORE	WSZZYPYX
			OPNH	NAWABSHAH	2335	0000	30	TOKYO	RJTDYPYX
			OPPS	PESHAWAR			30	Abu Dhabi	OMZZYPYX
			OPGD	GWADAR			24	Bahrain	OBZZYPYX
			OPSK	SUKKAR			24	Beijing	ZBBBYPYX
								Beirut	OLLLYPYX
								Hong Kong	VHZZYPYX
								Jeddah	OEJDYPYX
								Karachi	OPZZYPYX
								Tehran	OIIIYPYX
Mumbai	**VABB**	**FTIN31**	VAAH	AHMEDABAD	0535	0600	30	**BANGKOK**	VTBBYPYX

Table B : Collection and Dissemination of TAF (FT) Bulletins

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			VABB	MUMBAI/Chhatrapati Shivaji Intl.	1135	1200	30	BRISBANE	YBBBYPYX
			VANP	NAGPUR	1735	1800	30	SINGAPORE	WSZZYPYX
			VOBL	BANGALORE INTL APT	2335	0000	30	TOKYO	RJTDYPYX
			VOCB	COIMBATORE			30	Abu Dhabi	OMZZYPYX
			VOCI	COCHIN INTERNATIONAL AIRPORT			30	Bahrain	OBZZYPYX
			VOCL	CALICUT			30	Beijing	ZBBBYPYX
			VOHS	HYDERABAD INTERNATIONAL AIRPORT			30	Beirut	OLLLYPYX
			VOML	MANGALORE			30	Hong Kong	VHZZYPYX
			VOMM	CHENNAI			30	Jeddah	OEJDYPYX
			VOTR	TIRUCHCHIRAPPALLI			30	Karachi	OPZZYPYX
			VOTV	TRIVANDRUM			30	Tehran	OIIIYPYX
		FTIN32	VIDP	DELHI/Indira Gandhi Intl	0535	0600	30		
			VEBN	VARANASI	1135	1200	30		
			VIAR	AMRITSAR	1735	1800	30		
			VIJP	JAIPUR	2335	0000	30		
			VILK	LUCKNOW			30		
		FTIN33	VECC	NETAJI SUBHASH CHANDRA BOSE INTERNATIONAL AIRPORT, KOLKATA	0535	0600	30		
			VEPT	PATNA	1135	1200	30		
			VEGY	GAYA	1735	1800	30		
			VEGT	GUWAHATI	2335	0000	30		
		FTSB31	VCBI	BANDARANAIKE INTL AP COLOMBO	0535	0600	30		
			VCRI	MATTALA RAJAPAKSA INTERNATIONAL AIRPORT	1135	1200	30		
					1735	1800			
					2335	0000			
		FTMV31	VRMG	GAN INTERNATIONAL AIRPORT	0535	0600	30		
			VRMH	HANIMAADHOO INTERNATIONAL AIRPORT	1135	1200	30		
			VRMM	MALE INTERNATIONAL AIRPORT	1735	1800	30		
					2335	0000			
Kolkata	**VECC**	**FTBW31**	VGEG	M.A. HANNAN INTL. CHITTAGONG	0535	0600	30		
			VGHS	HAZRAT SHAHJALAL INTERNATIONAL AIRPORT	1135	1200	30		
			VGSY	*OSMANI INTERNATIONAL AIRPORT,SYLHET*	1735	1800	30		
					2335	0000			
		FTAS31	VNKT	KATHMANDU	0535	0600	30		
					1135	1200			
					1735	1800			
					2335	0000			
Nadi	**NFFN**	**FTPS31**	NCRG	RAROTONGA INTL.	0535	0600	24	BANGKOK	VTBBYPYX
			NFFN	NADI/Intl	1135	1200	24	BRISBANE	YBBBYPYX
			NFTF	FUA'AMOTU INTL.	1735	1800	24	SINGAPORE	WSZZYPYX
			NFTV	VAVA'U	2335	0000	24	**NADI**	NFZZRFXX
			NGTA	TARAWA/Bonriki Intl			24	TOKYO	RJTDYPYX
			NIUE	NIUE Intl			24	Hong Kong	VHZZYPYX
			NVSS	SANTO/Pekoa			24	Wellington	NZZZYPYA
			NVVV	PORT VILA/Bauerfield			24		
			PLCH	CHRISTMAS ISLAND			24		
			NSTU	PAGO PAGO Intl, Tutuila I.			24		
			NFNA	*NAUSOR/Intl*			24		
			NTAA	TAHITI FAAA			30		
			NWWW	NOUMEA LA TANTOUTA			24		
			NSFA	FALEOLO/Intl			24		
			NLWW	WALLIS HIHIFO			24		
Singapore	**WSSS**	**FTSR31**	WSSS	SINGAPORE/Changi	0535	0600	30	BANGKOK	VTBBYPYX
			WSAP	PAYA LEBAR (RSAF)	1135	1200	30	BRISBANE	YBBBYPYX
			WSSL	SELETAR	1735	1800	30	**SINGAPORE**	WSZZYPYX
			WAAA	UJUNG PANDANG/Hasanuddin (Comm Center)	2335	0000	30	TOKYO	RJTDYPYX
			WABB	BIAK/Frans Kaisiepo			30	NADI	NFZZRFXX
			WADD	BALI/Ngurah Rai			24 (30)	Abu Dhabi	OMZZYPYX
			WARR	SURABAYA/Juanda			24	Bahrain	OBZZYPYX
			WIHH	JAKARTA/Halimperdana Kusuma			24	Beijing	ZBBBYPYX
			WIII	JAKARTA/Soekarno Hatta (COMM CENTER)			30	Beirut	OLLLYPYX
			WIMM	MEDAN/Polonia			24	Colombo	VCCCYPYX
								Hong Kong	VHZZYPYX
								Karachi	OPZZYPYX

Table B : Collection and Dissemination of TAF (FT) Bulletins

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPYA
		FTSR32	WMKJ	JOHOR BAHRU/Sultan Ismail	0535	0600	24	BANGKOK	VTBBYPYX
			WMKK	SEPANG/KL International Airport	1135	1200	30	BRISBANE	YBBBYPYX
			WMKL	PULAU LANGKAWI/Intl	1735	1800	24	**SINGAPORE**	WSZZYPYX
			WMKM	*MALACCA*	2335	0000	24	TOKYO	RJTDYPYX
			WMKP	PENANG/Intl			24	Beirut	OLLLYPYX
			WMSA	*SUBANG/Sultan Abdul Aziz Shah*			24 (30)	Hong Kong	VHZZYPYX
								Manila	RPLLYMYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTSR33	WBSB	BRUNEI/Intl	0535	0600	30		
			WBGB	*BINTULU*	1135	1200	24		
			WBGG	KUCHING/Intl	1735	1800	24		
			WBGR	*MIRI*	2335	0000	24		
			WBGS	*SIBU*			24		
			WBKK	KOTA KINABALU/Intl			24		
			WBKL	*LABUAN (RMAF)*			24		
			WBKS	*SANDAKAN*			24		
			WBKW	*TAWAU*			24		
Tokyo	**RJTD**	**FTJP31**	RJAA	NARITA Intl	0235	0300	30	BANGKOK	VTBBYPYX
			RJBB	KANSAI Intl	0835	0900	30	BRISBANE	YBBBYPYX
			RJCH	HAKODATE	1435	1500	30	NADI	NFZZRFXX
			RJGG	CHUBU CENTRAIR Intl	2035	2100	30	SINGAPORE	WSZZYPYX
			RJOO	OSAKA Intl			30	**TOKYO**	RJTDYPYX
			RJSS	SENDAI			30	Beijing	ZBBBYPYX
			RJTT	TOKYO Intl			30	Beirut	OLLLYPYX
			ROAH	NAHA			30	Brasilia	SBBRYZYX
								Colombo	VCBIYMYX
								Guam	PGUMCOAX
								Hong Kong	VHZZYPYX
								Karachi	OPZZYPYX
								London	EGZZMASI
								Mumbai	VABBYPYX
								Noumea	NWCCYMYX
								Rome	LIIBYMYX
								Saipan	PGSNYMYX
								Incheon	RKSIYPYX
								Washington	KWBCYMYX
								Wellington	NZZZYPYA
		FTJP32	RJCC	SAPPORO/New Chitose	0235	0300	30	BANGKOK	VTBBYPYX
			RJFF	FUKUOKA/Fukuoka	0835	0900	30	BRISBANE	YBBBYPYX
			RJFK	KAGOSHIMA	1435	1500	30	NADI	NFZZRFXX
			RJFO	OITA	2035	2100	30	SINGAPORE	WSZZYPYX
			RJFT	KUMAMOTO			30	**TOKYO**	RJTDYPYX
			RJFU	NAGASAKI			30	Beijing	ZBBBYPYX
			RJNK	*KANAZAWA/Komatsu*			30	Beirut	OLLLYPYX
			RJNT	*TOYAMA*			30	Brasilia	SBBRYZYX
			RJOA	HIROSHIMA			30	Colombo	VCBIYMYX
			RJOB	OKAYAMA			30	Guam	PGUMCOAX
			RJOT	TAKAMATSU			30	Hong Kong	VHZZYPYX
			RJSN	NIIGATA			30	Incheon	RKSIYPYX
								Karachi	OPZZYPYX
								London	EGZZMASI
								Mumbai	VABBYPYX
								Noumea	NWCCYMYX
								Saipan	PGSNYMYX
								Washington	KWBCYMYX
								Wellington	NZZZYPYA
		FTJP38	*RJSA*	*AOMORI*	0235	0300	30	BANGKOK	VTBBYPYX
			RJSF	*FUKUSHIMA*	0835	0900	30	BRISBANE	YBBBYPYX
			RJSK	*AKITA*	1435	1500	30	NADI	NFZZRFXX
			RJOM	*MATSUYAMA*	2035	2100	30	SINGAPORE	WSZZYPYX
			RJNS	*SHIZUOKA*			30	**TOKYO**	RJTDYPYX
			RJEC	*ASAHIKAWA (civil)*			30	Beijing	ZBBBYPYX
			RJAH	*HYAKURI*			30	Incheon	RKSIYPYX

Table B : Collection and Dissemination of TAF (FT) Bulletins

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			RJCM	*MEMANBETSU*			30		
			RJCK	*KUSHIRO*			30		
			RJCB	*OBIHIRO*			30		
			RJOC	*IZUMO*			30		
			RJOH	*MIHO*			30		
			RJOK	*KOCHI*			30		
			RJFM	*MIYAZAKI*			30		
			ROIG	*ISHIGAKI JIMA*			30		
			RJFR	*NEW KITAKYUSHU*			30		
			RJFS	*SAGA*			30		
Wellington	**NZKL**	**FTNZ31**	NZWN	WELLINGTON Intl	0535	0600	24	BANGKOK	VTBBYPYX
			NZAA	AUCKLAND Intl	1135	1200	24	**BRISBANE**	YBBBYPYX
			NZCH	CHRISTCHURCH Intl	1735	1800	24	NADI	NFZZRFXX
					2335	0000		SINGAPORE	WSZZYPYX
								TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
		FTNZ32	NZQN	Queenstown	1130	1200	18		
					1730	1800			

APPENDIX C - IROG Back-up Procedures

1. Introduction

1.1 In order to ensure the continuity of OPMET exchange with the European Region (EUR), and the availability of the ASIA/PAC OPMET on the SADIS Gateway, Bangkok RODB will take over the role of the Singapore RODB whenever operational interruption occurs at the Singapore RODB.

1.2 Both RODBs, in coordination with the Secretariat and London IROG, should perform a real-time test of the procedures in order to practice and maintain regularity and currency in the event of an outage affecting OPMET exchange with EUR.

1.3 The Bangkok and Singapore RODBs have developed a mutual back-up arrangement that includes procedures for undertaking a back-up test.

2. Purpose

2.1 The purpose of the back-up test is to validate the dissemination process for notification messages between IROGs and ensure that the Procedures for handover and takeover of responsibility are functional.

3. Procedures

3.1 Singapore IROG provides the ASIA/PAC OPMET bulletins information to Bangkok IROG to establish the back-up distribution arrangement. Both IROGs are responsible to update the distribution list as and when required.

3.2 To activate the back-up plan, both IROGs will communication through facsimile and email.

3.3 Bangkok IROG will provide the contact points information and update periodically if required.

3.4 Both IROGs will review the back-up procedures and identify areas for improvement.

4. Real-time Back-up Test Procedure

4.1 As the back-up test and monitoring could consume considerable resources, both IROGs have agreed to monitor a list of selected ASIA/PAC OPMET bulletins. IROG back-up procedures are to be tested at least annually and will normally be of 6 hours duration, between 0200 and 0800 UTC.

4.2 Communication test

4.2.1 The communication test between the IROGs should be conducted through facsimile and email and advised two days before the test.

4.3 Real-time back-up exercise

4.3.1 At the day of exercise, Singapore IROG shall inform Bangkok IROG to take over its role when it stops sending the selected OPMET messages on the AFTN.

4.3.2 Bangkok IROG shall acknowledge the notification messages and start relaying Asia Pac OPMET Information to WAFC, London.

4.3.3 Both IROGs shall record the reception and transmission of the monitored OPMET bulletins during the exercise.

4.3.4 At the end of back-up test, both IROGs shall resume message switching as per normal after exercising stand-down procedures.

5. Assessment

5.1 Both IROGs shall evaluate the monitoring result and address the following issues during the ROBEX WG meeting:

(i) Monitoring result in term of message throughput (comparison of percentage of messages received against messages relayed);
(ii) Transit time of the relayed messages;
(iii) Undertake the necessary follow-up of issues arose from the exercise; and
(iv) Verify and develop existing procedures.

APPENDIX D - Use of WMO Abbreviated Heading

(For use in ROBEX Messages and Bulletins)

1. Each ROBEX bulletin should have a WMO abbreviated heading in accordance with *WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS*. The symbolic form of the WMO abbreviated heading is as follows:

$T_1T_2A_1A_2$ii CCCC YYGGgg (BBB)

2. Explanation of the symbols

2.1. **$T_1T_2A_1A_2$ii** – this group is used in accordance with *WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS, Attachment II-5*.

2.1.1 **T_1T_2** - Data type designator, used for OPMET data as follows:

Data type	Abbreviated name	WMO data type designator	
		TAC	IWXXM
Aerodrome reports	METAR SPECI	SA SP	LA LP
Aerodrome forecasts	TAF: 12 to 30 hour	FT	LC
SIGMET information	SIGMET SIGMET for TC SIGMET for VA	WS WC WV	LS LY LV
AIRMET information	AIRMET	WA	LW
Volcanic Ash and Tropical Cyclone Advisories	Volcanic Ash Advisory Tropical Cyclone Advisory	FV FK	LU LK
Air-reports	AIREP SPECIAL (ARS)	UA	N/A
Space Weather Advisory	SWXA	FN	LN
Administrative	METNO	NO	N/A

Note: IATA TAF requirements in the ASIA/PAC region are for TAF validity of either 24 or 30 hours. Some States issue 12- and 18-hour TAF, which don't meet requirements, but are nevertheless classified as FT for the WMO data type designator.

2.1.2 **A_1A_2** - Geographical designator, composed of two letters, according to WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS, Attachment II-5, Table C1. The following principles shall apply:

a) For ROBEX bulletins containing OPMET data from a single State or territory, the A_1A_2 designator should be chosen from Table C1, Part I – Country or territory designator;

b) For ROBEX bulletins containing OPMET data from more than one State or territory, a suitable A_1A_2 designator should be chosen from Table C1, Part II – Area Designators;

c) The part of the Table C1, Part II – Area Designators, which is relevant to the ROBEX scheme is reproduced below.

A_1A_2	**Country or territory**
AH	Afghanistan
AS	Asia
AU	Australia
BD	Brunei Darussalam
BM	Myanmar
BW	Bangladesh
CI	China
ER	United Arab Emirates
GM	Guam Islands
HK	Hong Kong, China
ID	Indonesia
IN	India
JP	Japan
KB	Kiribati
KO	Republic of Korea
KP	Cambodia
KR	Democratic People's Republic of Korea
KU	Cook Islands
LA	Lao People's Democratic Republic
MH	Marshall Islands
MS	Malaysia
MU	Macao
MV	Maldives
NC	New Caledonia
NG	Papua New Guinea
NP	Nepal
NV	Vanuatu
NW	Nauru Island
NZ	New Zealand
OC	Oceania
PA	Pacific area
PF	French Polynesia

A_1A_2	**Country or territory**
PH	Philippines
PK	Pakistan
PS	South Pacific area
QT	Qatar
SB	Sri Lanka
SD	Saudi Arabia
SO	Solomon Islands
SR	Singapore
TH	Thailand
TM	Timor
TO	Tonga
TV	Tuvalu
US	United States of America
VS	Vietnam
ZM	Western Samoa

2.1.3 **ii** - series number of the bulletin. It shall be a number with two digits used to differentiate two or more bulletins with the same TTAA issued by an originator or a compiler of bulletins. "ii" will be unique to each bulletin.

2.1.3.1 The assignment of "ii" to bulletins should be selected from within the following sets;

ii = 01-19 inclusive for global distribution
ii = 20-39 inclusive for regional and inter-regional distribution
ii = 40-89 inclusive for national and bilaterally agreed distribution

2.1.3.2 For most of the ROBEX bulletins "ii" should be selected from the set "20 – 39". In case of METAR/TAF bulletins, ROCs issuing only one bulletin should use "31", whilst ROCs issuing more than one bulletin should use "31", "32", etc.

2.2. **CCCC** - ICAO location indicator, according to Location Indicators, ICAO Doc 7910, of the ROBEX centre preparing the ROBEX Bulletin, or of the originator (aeronautical meteorological station, aerodrome meteorological office or NOC).

2.3. **YYGGgg –** Date-time group as follows:

2.3.1 YY - Day of the month.

2.3.2 GGgg - Hours and minutes

- For METAR bulletins: the standard time of observation in UTC.

- For TAF bulletins: the full hour in UTC (the last two digits shall be 00) preceding the transmission time.

- For all other bulletin/messages: the time of compilation in UTC.

2.4. **BBB -** Optional group indicating an amended, corrected or delayed bulletin.

2.4.1 An abbreviated heading defined by TTAAii CCCC YYGGgg shall be used only once. Consequently, if this abbreviated heading has to be used again for an addition, a correction or an amendment, it is mandatory to add an appropriate BBB indicator, which shall be added after the date-time group. The indicator BBB shall be used as follows;

- RRx - for delayed routine meteorological messages/bulletins, and for segmenting a large set of information into several bulletins;
- CCx - for corrections to previously relayed messages/bulletins;
- AAx - for amendments to TAF messages/bulletins;

The "x" above is an alphabetic character of A through X, indicating the sequential number of the irregular bulletin of certain type. For instance, for amended TAFs, AAA is used for the first amendment, AAB for the second, AAC for the third, etc; for delayed METARs or TAFs, RRA is used for the first delayed message, RRB for the second, etc.; and, for corrections to any OPMET bulletin, CCA is used for the first correction, CCB for the second, etc.

2.4.2 The current limitation of the AFTN regarding the length of the bulletins is up to 1800 characters (note that the WMO Header and spaces are counted as characters). Bulletins longer than this will be split into two parts; in such a case, the optional group RRx is used for additional or subsequent issuances of messages with the same abbreviated heading line including the YYGGgg regardless of whether these reports are on time, late or delayed. In the ASIA/PAC Region, RRA is used for the second part of a split bulletin. An example of a split bulletin using RRA is shown below.

Example

First Part

GG WSSSYMYX
171000 VABBYMYX
FTIN32 VABB 170900
TAF VCBI 170940Z 1712/1812 23012KT 9999 SCT016 TX30/1808Z
TN27/1723Z TEMPO 1714/1718 7000 -SHRA FEW010 SCT016
TEMPO 1723/1802 7000 -SHRA SCT010 BKN016=
TAF VNKT 170900Z NIL=
TAF VOCI 170900Z 1712/1818 29005KT 4000 -RA/HZ SCT015 SCT020 FEW025CB BKN100 BECMG 1716/1717 3000 -RA/HZ TEMPO 1712/1721 1500 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1804/1805 30005KT 4000 HZ BECMG 1806/1807 27010KT 5000 -RA/HZ TEMPO 1809/1815 1500 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1816/1817 3000 HZ=
TAF VOCL 170900Z 1712/1818 33005KT 4000 -RA/HZ SCT015 SCT020 FEW025CB BKN100 BECMG 1716/1717 3000 -RA/HZ TEMPO 1712/1721 2000 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1804/1805 35005KT 5000 HZ BECMG 1806/1807 32010KT 5000 -RA/HZ

TEMPO 1809/1815 2000 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1816/1817 3000 HZ=
TAF VOHS 170900Z 1712/1818 27010G20KT 6000 SCT020 SCT100 TEMPO 1712/1718 3000 -TSRA/RA SCT015 FEW025CB BKN080 TEMPO 1721/1803 3000 -TSRA/RA/HZ SCT015 FEW025CB BKN080 TEMPO 1809/1818 3000 -TSRA/RA SCT015 FEW025CB BKN080=
TAF VOHY 170900Z NIL=
TAF VOMM 170900Z 1712/1818 17010KT 6000 SCT020 BKN100 TEMPO 1712/1718 SCT015 FEW025CB BKN100 BECMG 1720/1721 21010KT SCT020 BECMG 1803/1804 27010KT 8000 FEW020 SCT100 BECMG 1810/1811 13010KT TEMPO 1812/1815 SCT015 FEW025CB BKN100 BECMG 1813/1814 6000=
TAF VOTR 170900Z 1712/1818 27010KT 6000 SCT020 SCT100 TEMPO 1712/1715 SCT015 FEW025CB BKN100 BECMG 1716/1717 33005KT FEW020 BECMG 1803/1804 27010G20KT 8000 FEW020 SCT250 BECMG 1812/1813 27005KT 6000 TEMPO 1812/1815 SCT015 FEW025CB BKN100=

Second Part

GG WSSSYMYX
171000 VABBYMYX
FTIN31 VABB 170900 **RRA**
TAF VIJP 170900Z 1712/1818 28006KT 4000 HZ FEW030 BECMG 1803/1805 29005G15KT 3000 HZ FEW030 SCT100 TEMPO 1712/1716 FEW030CB=
TAF VILK 170900Z 1712/1721 34005KT 6000 NSC BEC 1716/1718 VRB02KT 5000 HZ=

APPENDIX E – Procedure and Format of METNO bulletin for APAC ROBEX Bulletins

METNO Message Format (Example)

Priority	GG
Addressees of ROCs and RODBs	VTBBYPYX ZBBBYPYX YBBNYPYX VCCCYPYX VIDPYPYX VHZZYPYX RKSIYPYX WIZZYPYX VECCYPYX OPZZYPYX WMZZYPYR VABBYPYX NFFNYPYX RJTDYPYX NZZZYPYX WSZZYPYM
Origin	ddhhmm WSSSYPYX
Abbreviated header	TTAA99 CCCC YYGGgg Example: NOSR99 WSSS 180200
Message identifier, region description, date of implementation (year, month, date): New Bulletin (**NEWBUL**)| Delete Bulletin (**DELBUL**)| Add Report to existing bulletin (**ADDRPT**)| Remove Report from existing bulletin (**RMVRPT**) + Bulletin/Report key (TTAAii CCCC Station)(1) End of METNO	METNO APAC OPMET YYMMDD NEWBUL (description of new bulletin and content) DELBUL (description of bulletin to be deleted and content) ADDRPT (description of added aerodromes to existing bulletin) RMVRPT (description of aerodromes to be deleted from existing bulletin) END=

(1) The METNO Bulletin/Report reference only contains the Bulletin/Report index TTAAii $CCCC_1$ $CCCC_2$ where:

- TTAAii is the abbreviated header
- $CCCC_1$ the compiling centre
- $CCCC_2$ the Report | FIR location indicator.

The index refers to the modified record in the OPMET catalogue published on the FTP-server(s). The dates on the relevant records shall contain the AIRAC date in the line after the abbreviated header.

Example of a METNO message in AFTN format:

```
GG
NOSR99 WSSS 180200
METNO APAC OPMET 061115
NEWBUL FTSR33 WSSS WBSB WBGB WBGG WBGR WBGS
                  WBKK WBKL WBKS WBKW
RMVRPT FTSR31 WSSS WMKK WMSA WMKP WMKJ
ADDRPT FTSR31 WSSS WAAA WABB WIMM
RMVRPT FTSR32 WSSS WBSB WBKK WBGG WIMM
ADDRPT FTSR32 WSSS WMKJ WMKK WMKL WMKM WMKP WMSA
END=
```

1. METNO Procedure – General rules

1.1. Modification requests to the production of national OPMET-data shall be reported by the NOC (National OPMET Centre) to the Regional OPMET Centre (ROC). The ROC then forwards the requests to the regional Focal point (FP) or regional Team for publication, evaluation and FP processing accepted changes.

1.1.1. The regional FP or regional Team verifies the conformity of the change proposal against ICAO DOC7910 (only registered Location Indicators can be accepted), electronic ANP (eANP) Volume II MET tables, WMO No. 386 documents and that the syntax is conform to the METNO procedure. Implementation of IWXXM data: no IWXXM without TAC will be accepted. In addition, separated bulletins will be produced for AOP airport and agreed exchanged non AOP airports OPMET data.

1.2. Modification requests for an upcoming AIRAC date have to be sent at the latest by the preceding AIRAC date. This will guarantee that all subsequent steps can be performed in time. For planning purposes modification requests should be provided well in advance (between 30 and 60 days before the AIRAC date) to allow full assessment by the regional FP (or regional group in charge of OPMET) and to provide confirmation to the originator that all changes will be made at the required date.

1.3. The regional FP will summarize all requests and present those via email to the regional group in charge of OPMET at the latest 7 days after the preceding AIRAC date.

1.4. The regional group members will review the requests and shall communicated any comments to the FP at the latest 14 days after the preceding (14 days before the upcoming) AIRAC date. Nil comments shall be considered as a positive response.

1.5. At 21 days after the preceding (7 days before the upcoming) AIRAC date, the FP shall announce the list of accepted amendments to the ICAO Regional Office, the NOCs by means of a standard formatted METNO message for routine meteorological information sent via Aeronautical Fixed Service (AFS - SADIS and WIFS by their regional associated ROC).

1.6. The involved NOCs in turn shall notify users in their State about their requested modifications.

1.7. In addition, regional contacts (as agreed during regional MET meeting) will receive a confirmation by email. Motivated subscription to (or to unsubscribe from) the METNO Bulletins can be submitted via the regional MET Group or directly by utilizing the contact form provided on the regional Website (where available).

1.8. The modifications shall be implemented by all affected centres on AIRAC date, at 02:00 UTC or when a new bulletin header is created, on opening hours the day before the implementation date.

1.9. The AIRAC OPMET data updates shall be applied by: The ROCs and IROGs for routing the current OPMET data in accordance with the dissemination regional Schema.

1.10. In order to avoid difficulties in processing OPMET Data modifications during major holidays, it can be decided to skip a particular AIRAC Cycle occurring in these periods.

1.11. For urgent modification, it can be decided with the explicit agreement of the regional METNO focal point/regional team to proceed more quickly by deviation to the normal

schedule. The FP/regional team will compile AIRAC METNO, or EXTRA METNO for intermediate updates with immediate implementation of new or expiring bulletins.

1.12. Key issues to be considered for the management of AFS data traffic volumes are:

- Avoid data duplication
- Authenticated data only
- ANP required data (AOP)
- Agreed exchanged Non-AOP data

1.13. Standardized Regional OPMET Data Catalogues including METNO-registered data can be compiled from the database of METNO-registered OPMET data: TAC & IWXXM, on AFS:

- Regional OPMET Database (RODB) catalogue
- Regional and Global OPMET data catalogues

2. Format and Content of the METNO-message

2.1. The METNO Syntax: The syntax of a METNO statement is presented hereafter. It may also include the list of AFS addressees actually used as well as examples for the various OPMET data update METNO statements.

2.2. The METNO Header: The header of the METNO bulletin is NOXX31 CCCC YYGGgg, where:

- XX is a general area designator (example : EU for EUR, AF for AFI …)
- CCCC is the AFTN location indicator of the regional FP Centre (example: EBBR for EUR)

2.3. The METNO statements for registration and updating of OPMET / IWXXM data are:

- ADDRPT / RMVRPT: for adding / removing Routine OPMET data in an already registered bulletin
- NEWBUL / DELBUL: for registering a new / unregistering an expiring (Non-)Routine OPMET bulletin and its contained data

2.3.1. ADDRPT

2.3.1.1. This statement is used when a new location indicator is added to an already registered bulletin. It can be used in combination with METAR or TAF bulletins.

2.3.1.2. Adding TAC-formatted METARs/TAFs to a registered bulletin does not automatically register the IWXXM equivalent data. TAC data can exist without a IWXXM until November 2020.

2.3.1.3. Adding IWXXM METARs/TAFs to a registered bulletin will by default result in adding the equivalent TAC METARs/TAFs for their parallel distribution. There can be no IWXXM data without any equivalent TAC-formatted version of the data.

2.3.2. RMVRPT

2.3.2.1. This statement is used for METARs/TAFs planned to be removed from an already registered bulletin. Removed reports can possibly be registered for all location in other existing or in new registered bulletins.

2.3.2.2. Removing TAC-formatted METARs/TAFs from a registered bulletin will also remove the equivalent IWXXM data from the OPMET data register in case it has already been registered. There is no IWXXM data without equivalent TAC-formatted data.

2.3.2.3. Removing IWXXM METARs/TAFs will by default result in removing equivalent TAC METARs/TAFs from the OPMET data register. If the TAC data need to be continued, it has to be re-registered explicitly, using ADDRPT.

2.3.3. NEWBUL

2.3.3.1. This statement is used for the registration of a new bulletin. It can be used for all supported data.

2.3.3.2. The registration of a new IWXXM bulletin by default implies the introduction of the TAC equivalent.

2.3.4. DELBUL

2.3.4.1. This statement is used for the deletion of a registered bulletin. It can be used for all supported data types.

2.3.4.2. The deletion of a registered IWXXM bulletin implies automatically the deletion of the TAC equivalent. TAC equivalents which are meant to be continued have to be re-introduced explicitly by applying NEWBUL.

2.3.4.3. Deletion of TAC OPMET bulletin by default also deletes the IWXXM equivalent.

3. METNO Focal Point – Prerequisites and Actions

3.1. The Focal Point (FP)/regional group prerequisites are:

- Generic email address (including FP persons and backups)
- AFS connection address
- Access to ICAO references (documents and Regional contacts)
- Data management software for processing basic lists of METNO-registered data to be shared inter-regionally in standardized international data formats (*.csv, *.txt)

3.2. The FP/regional group receives update requests any time by email:

- Preferably via ROC, but also from NOCs
- After authentication, sort updates based on suggested implementation date (AIRAC if no date proposed)
- Compiles AIRAC METNO or EXTRA METNO for intermediate updates with immediate implementation of new or expiring bulletins

3.3. Forward requests for ANP additional OPMET data via email to the Regional ICAO Office contact.

3.4. Co-ordination and evaluation of received update requests via email.

3.5. Compilation of AIRAC / EXTRA METNO bulletin for distribution to regional ROCs / IROGs.

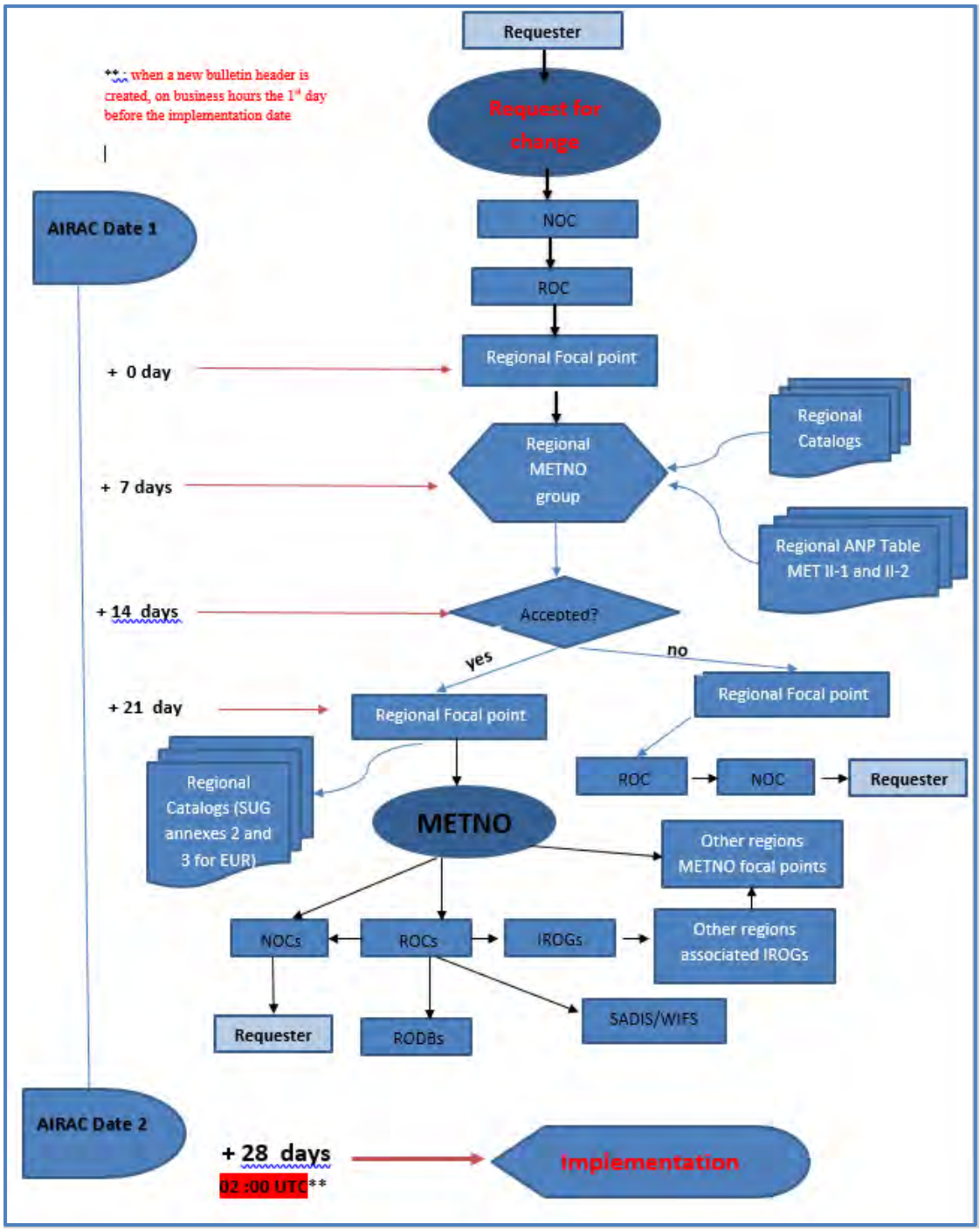
3.6. Maintenance of regional METNOs and registered OPMET data.

3.7. Reports to OPMET regional group.

3.8. Facilitates OPMET data monitoring.

3.9. The regional focal point and team for management of the METNO process would include the relevant ICAO Regional Officer and ROBEX Focal Points from Australia, Hong Kong China, Japan and Singapore.

4. METNO Process Diagram



APPENDIX F - OPMET Quality Control and Monitoring Procedures

1 Quality Control Procedures

1.1 *OPMET Data Validation*

1.1.1 The ROCs and RODBs should not modify the content of the meteorological data, e.g. visibility, QNH etc., but only items contained in the WMO bulletin headings, such as, location indicators or observation times.

1.1.2 WMO Abbreviated Heading (TTAAii CCCC YYGGgg BBB) Validation

TT	Message Type, shall comprise two alphabetical characters
AA	Location Indicator, shall comprise two alphabetical characters
ii	comprise two digits, from 01 to 99
CCCC	A 4-letter ICAO location indicator shall comprise 4 alphabetical characters.
YYGGgg	The date time group of the bulletin, shall be configured to validate it with the current time
BBB	BBB is an optional group. The use of BBB group shall comply with the rules in the WMO abbreviated heading, in regard to delayed, corrected and amended bulletins.

Examples	After QC check
METAR with incorrect YYGGgg: SABM31 VYMD 100830 **UTC** VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =	 SABM31 VYMD **100830** VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =
TAF without AHL: 112324 WIDDYMYX TAF WIDD 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=	 **FTID31 WIDD 112300** TAF WIDD 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=
TAF with invalid BBB: FTBN31 OBBI 030525 **AMD** TAF AMD OBBI 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=	 FTBN31 OBBI 030525 **AAA** TAF AMD OBBI 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=

1.1.3 METAR/SPECI Validation

For each individual METAR or SPECI within a bulletin the following additional fields shall be validated:

Prefix checks	METAR METAR COR SPECI SPECI COR	SA SA SP SP
Observation Time YYGGggZ	The report shall have a valid date and time of observation, including the character 'Z'. In a SPECI bulletin, this group will be same as (or very close to) the YYGGgg, part of the abbreviated bulletin heading.	
End-of-message format "=""	Each METAR or SPECI report shall be terminated by the "=" character.	

Examples:	After QC check
METAR with Observation Time error: SAPK31 OPKC **<u>030159</u>** RRA OPKC **030200** 26004 8000 BKN020 27/23 Q1007 NOSIG=	 SAPK31 OPKC **<u>030200</u>** RRA OPKC **030200** 26004 8000 BKN020 27/23 Q1007 NOSIG=
METAR with mistyped observation time: SAID31 WADD **<u>120100</u>** METAR WADD **<u>121000Z</u>** 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=	 SAXX31 WADD **120100** METAR WADD **<u>120100Z</u>** 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=
SPECI with incorrect Message Type, TT: **<u>SANZ31</u>** NZKL 040000 **<u>SPECI</u>** NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG=	 **<u>SPNZ31</u>** NZKL 040000 AAA **<u>SPECI</u>** NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG=

1.1.4 <u>TAF Validation</u>

For each individual TAF within a bulletin, the following additional items shall be validated:

Prefix checks	TAF TAF COR TAF AMD	FT or FC FT or FC FT or FC
Issue Time YYGGggZ	If the field is included, it shall have a valid date and time of origin of forecast including 'Z'.	
Validity $Y_1Y_1G_1G_1/Y_2Y_2G_2G_2$	Some TAFs are still produced with a 4-digit validity period. These shall be corrected by inserting a date consistent with the current date and the date time group of the bulletin header. If a TAF is received without a validity period it shall be discarded.	
End-of-Message format "=""	Each forecast shall be terminated by the "=" character.	

Examples:	After QC check
TAF with issue time error (wrong date): FCID31 WIII 181630 TAF WIII **041630Z** 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=	 FCID31 WIII 181630 TAF WIII **181630Z** 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=
TAF with mistyped Validity Period: FTPH31 RPLL 132200 TAF RPLC 132200Z **1400/1428** 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 –SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=	 FTPH31 RPLL 132200 TAF RPLC 132200Z **1400/1424** 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 –SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=
TAF with Validity error (wrong date): FCMS33 WMKK 170748 TAF WMKK 170700Z **3009/3018** 30005KT 9999 FEW017CB SCT140 BKN270=	 FCMS33 WMKK 170748 TAF WMKK 170700Z **1709/1718** 30005KT 9999 FEW017CB SCT140 BKN270=
TAF with 4-digit Validity period: FTXX31 WIDD 170121 TAF WIDD **0618** 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000=	 FTXX31 WIDD 170121 TAF WIDD **1706/1718** 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000=

1.1.5 SIGMET Validation

CCCC on the AHL	A valid 4-letter ICAO location indicator indicating the FIR for which the SIGMET was.	
Prefix checks	SIGMET for TS, TURB, ICE, MTW, DS, SS and RDOACT CLD	WS
	SIGMET for VA	WV
	SIGMET for TC	WC
Validity Period DDHHMM/DDHHMM	Shall have a valid period of validity. Validity periods may be corrected if: • Missing VALID string • Incorrect SIGMET number format • Incorrectly formatted validity period	
Note: For SIGMET validation, please refer to the format described in the ASIA/PAC Regional SIGMET Guide.		

Examples:	After QC check
SIGMET without TTAAii: **SIGMET** OYSN 121525Z OYSC SIGMET 1 VALID 121530/122130 OYSN- SANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=	 **WSXX31** OYSN 121525Z OYSC SIGMET 1 VALID 121530/122130 OYSN- SANAA FIR EMBD TS OBS/FCST OVER WESTERN AND SOUTHWESTERN MOUNTAINS AND COASTAL AREAS CB TOPS FL36 NC=
SIGMET with incorrect number format WCPH30 RPLL 210445 SIGMET **NO 01** VALID 210000/210600 RPLL TC OBS N0830 E12900 ….=	 WCPH30 RPLL 210445 SIGMET **01** VALID 210000/210600 RPLL TC OBS N0830 E12900 … =
SIGMET with incorrect formatted validity period: WSIN90 VIDP 181800 VIDP SIGMET 06 VALID **18/1600 TO 18/2000 UTC** VIDP- DELHI FIR EMBD TS … = WSSD20 OEJD 220503 OEJD SIGMET 01 VALID **220500 TO 220900** OEJN- JEDDAH FIR ….=	 WSIN90 VIDP 181800 VIDP SIGMET 06 VALID **181600/182000** VIDP- DELHI FIR EMBD TS … = WSSD20 OEJD 220503 OEJD SIGMET 01 VALID **220500/220900** OEJN- JEDDAH FIR … =

1.2 Quality Control Methods

OPMET Data	Elements Defining	Control Methods
METAR METAR COR SPECI (SA,SP)	• AHL • Code name • Observation date/time	Software verification Manual validate Periodic Quality Control & PI Monitoring
TAF TAF AMD TAF COR (FT,FC)	• AHL • Code name • Originating station ICAO location indicator • Date/time of issue • Date, time of starting, time of end of the period the forecast refers to	Software verification Manual validate Periodic Quality Control & PI Monitoring
SIGMET (WS, WC, WV)	• AHL • SIGMET Sequence No • Date/time groups indicating the period of validity Additional Checks (recommended):	Software verification Manual validate Periodic SIGMET Quality Control Monitoring

	• Name of the FIR or the CTA the message is issued for • Location indicator of the MWO originating the message	
Volcanic Ash Advisory FV	• Type of message • Issue date and time Additional Checks (recommended): • Location indicator or name of the VAAC centre originating the message	Software verification Manual validate Periodic VA Quality Control Monitoring
Tropical Cyclone Advisory FK	• Type of message • Issue date and time Additional Checks (recommended): • Location indicator or name of the TCAC centre originating the message	Software verification Manual validate Periodic TC Quality Control Monitoring

2 OPMET Monitoring

2.1 Monitoring of Scheduled OPMET data

2.1.1 Performance Indicators (PIs). The indices to be used by the RODBs are based on those developed by the European Bulletin Management Group BMG) (refer to the *EUR OPMET Data Management Handbook, Appendix F, Output Performance Indices*).

(i) Compliance Index

The ROBEX Compliance index can be calculated from:

$$V_{bul\ compliance} = \frac{No\ of\ reports\ received\ for\ a\ bulletin}{No\ of\ reports\ required\ for\ the\ bulletin}$$

The Compliance Index is to assess the level of compliance to the ROBEX scheme. The determination of the compliance index is performed as follows:

- Total number of reports received for ROBEX bulletin during the monitoring period, include reports in the retard bulletins.
- Weed out correction and amendment bulletins, as these are re-transmitted messages, can be disregarded.

Explanation:

No. of reports received for a bulletin is the number of reports that are not "NIL." In other words, do not count the reports that are "NIL." In addition, do not count reports that are correction and amendment in nature. However, the assessment should include the delayed reports in the retard bulletins.

No. of reports required for a bulletin is the number of reports that each RODB should expect to receive within each particular bulletin.

Procedure:

1. For each day, run through the aerodromes within each bulletin. Count the number of reports that do not contain optional elements and are not "NIL." Alternatively count the number of reports that contain "Optional RRX
2. For each day, calculate the required number of reports for each bulletin by adding the number of required reports for each aerodrome listed in each bulletin.
3. For each day, calculate the compliance index by taking the ratio of the No. of reports received for a bulletin (calculated in 1.) and the number of reports required for a bulletin (calculated in 2.).
4. To calculate the monthly compliance index, add up the compliance index (calculated in 3.) of all the days in a month and divide by the number of days in month, e.g., 288/288 + 240/288 + 288/288 + ... + 288/288 => (31 elements for 31 days)
5. Alternatively, to calculate monthly compliance index, add up the number of reports received for a bulletin (calculated in 1.) for all the days in a month and divide by the number of reports required for a bulletin (calculated in 2.) in that month.

Example 1:
Bulletin SAIN33 includes 6 aerodromes (VECC, VEPT, VGEG, VGHS, VNKT and VQPR). For each aerodrome, the number of reports required for a bulletin equals 2*24 = 48 reports. Because the official observation time of the bulletin is at every hour and half-hour (i.e., HH+00 and HH+30) resulting in two reports for each of the 24 hours in each day**.** If only on the 2nd of March, the RODB does not receive reports from one aerodrome. Calculate the compliance index for Bulletin SAIN33 in March.
Answer:
No. of reports received for a bulletin
= (6 aerodromes*48 reports*30 days) + (5 aerodromes*48 reports*1 day)
= 8,640 + 240
= 8,880
No. of reports required for a bulletin
= (6 aerodromes*48 reports*31 days) = 8,928
March compliance index = 8,880/8,928 = 0.9946

(ii) Availability Index

The availability index measures the current coverage of the OPMET distribution against the ROBEX exchange requirements. The determination of the availability index is performed on a daily basis from the data captured

during the monitoring period. If at least one non-NIL report is received from the aerodrome during the 24-hour period, that aerodrome is considered to have been available. The daily availability index of a particular bulletin can be calculated as:

$$V_{bul\ availability} = \frac{\textit{No of aerodromes for which one or more non-NIL data type are received}}{\textit{No of aerodromes required in the bulletins}}$$

NIL data type is defined as data element that reports there are no observations (SA) or forecast (FT).

Non-NIL data type is defined as data element that is not "NIL" i.e. not (METAR VTBD 270200Z NIL=).

No of aerodromes for which one or more non-NIL data type are received is the number of aerodromes which receives one or more Non-NIL data type within a period of one day or 24 hours.

No of aerodromes required in the bulletins is the total number of aerodromes listed in the bulletin from which RODB should receive data from.

For example, the Bulletin SAIN33:
SAIN33 VECC 012350
METAR VECC 012350Z 16004KT 2500 HZ SCT018 BKN100 28/26 Q0996 NOSIG=
METAR VEPT 012350Z NIL=
METAR VGEG 012350Z 14007KT 6000 SCT015 BKN100 27/26 Q0998 NOSIG=
METAR VGHS 012350Z 17005KT 4000 HZ BKN010 OVC100 28/25 Q0997 TEMPO RA=
METAR VNKT 012350Z NIL=
METAR VQPR 012350Z NIL=

The number of aerodromes required in the bulletin SASD31 for that particular day is 6 aerodromes.

Procedure:
1. For each day or the period of 24 hours, obtain the number of aerodromes required in the bulletin.
2. For each day or the period of 24 hours, run through the aerodromes within each bulletin. Count the numbers reports received from each aerodrome that contain Non-NIL data type. If the number exceeds zero, then that aerodrome receives one point, else zero point. Add up the points of each aerodrome to obtain the number of aerodromes for which one or more non-NIL data type is received.
3. For each day, calculate the availability index by taking the ratio of the number of aerodromes for which one or more non-NIL data type are

received (calculated in 2.) and the number of aerodromes required in the bulletin (calculated in 1.).

4. To calculate monthly availability index, add up the daily availability index (calculated in 3.) of all the days in a month and divide by the number of days in month, e.g., 6/6 + 6/6 + 6/6 + 5/6 + 4/6 + 6/6 + ... + 2/6 => (31 elements for 31 days).
5. Alternatively, to calculate monthly availability index, add up the number of aerodromes for which one or more non-NIL data type are received (calculated in 2.) for all the days in a month and divide by the number of aerodromes required in the bulletin (calculated in 1.) in that month.

Example 2:
Bulletin SAIN33 continued from example 1.
Calculate the availability index for Bulleting SAIN33 in March.?
Answer:
No. of aerodromes required in the bulletin
= 6 aerodromes *31 days
= 186
No of aerodromes for which one or more non-NIL data type are received
= (6 aerodromes*30 days) + (5 aerodromes*1 day)
= 180 + 5
= 185
March availability index = 185/186 = 0.9946

(iii) Regularity Index

The regularity index measures the consistency in the number of reports provided by an aerodrome. The computation of Regularity Index assumes that the number of reports follows a normal distribution and attempts to ascertain the distribution characteristics (mean and standard deviation) from a set of data. These characteristics are used to determine if the subsequent number of reports from an aerodrome is "regular".

Denoting mean and standard deviation by μ and σ , a threshold report numbers (τ) can be established as:

$$\tau = \mu - \sigma$$

The threshold is a reporting characteristic of an aerodrome. If the subsequent daily number of reports meets or exceeds the threshold, it is considered "regular". The daily regularity index for a bulletin can be expressed as:

$$V_{bul\ regularity} = \frac{\textit{No of aerodromes for which the number of reports equals or exceeds the threshold}}{\textit{No of aerodromes required in the bulletin}}$$

The **threshold** is the number of reports provided by the aerodrome which is considered "regular." This number is defined by calculating the

statistics (mean and standard deviation) of the number of reports provided by the aerodrome within a time frame e.g., a period of 6 months, 1 year, or 5 years.

No of aerodromes which the number of reports exceeds the threshold is the number of aerodromes which provide more than τ reports within a period of one day or 24 hours.

No of aerodromes required in the bulletin is the total number of aerodromes listed in the bulletin from which RODB should receive data from.

Procedure:

1. Calculate the threshold for each aerodrome within the RODB's responsibility by collecting the number of reports each aerodrome receives within the given time frame.
2. For each aerodrome, find the mean (average) and standard deviation (deviation from the mean), e.g., for a time frame of five days (for simplicity), VECC provides daily 10, 7, 10, 8, and 9 reports respectively, therefore, Mean = (10+7+10+8+9)/5 = 8.8 and Standard deviation = sqrt [(10-8.8)^2+(7-8.8)^2+(10-8.8)^2+(8-8.8)^2+(9-8.8)^2] / 5 = 1.304
3. Calculate the threshold by subtracting the standard deviation from the mean. From the above example, the threshold τ = 8.8-1.304 = 7.45 reports.
4. For each day or the period of 24 hours, run through the aerodromes within each bulletin. Count the number of reports received from each. If the number exceeds τ, then that aerodrome receives one point, else zero point. Add up the points of each aerodrome to obtain the No of aerodromes which the number of reports exceeds the threshold.
5. For each day or the period of 24 hours, obtain the number of aerodromes required in the bulletin.
6. For each day, calculate the regularity index by taking the ratio of the number of aerodromes which the number of reports exceeds the threshold (calculated in 4) and the number of aerodromes required in the bulletin (calculated in 5).
7. To calculate monthly regularity index, add up the daily availability index (calculated in 3) of all the days in a month and divide by the number of days in month, e.g., 6/6 + 6/6 + 6/6 + 5/6 + 4/6 + 6/6 + ... + 2/6 => (31 elements for 31 days).
8. Alternatively, to calculate monthly availability index, add up the number of aerodromes which the number of reports exceeds the threshold (calculated in 4) for all the days in a month and divide by the number of aerodromes required in the bulletin (calculated in 5) in that month.

Example 3:
Bulletin SAIN33 continued from example 1.

Aerodrome	Threshold
VECC	10 reports
VEPT	10 reports
VGEG	10 reports
VGHS	10 reports
VNKT	10 reports
VQPR	10 reports

If on the 2nd and 15th of March, the RODB does not receive reports from VQPR and on 15th of March, the RODB does not receive reports from VGEG. On any other days, all the aerodromes provided more than 10 reports. Calculate the regularity index for Bulletin SAIN33 in March.
Answer:
No. of aerodromes required in the bulletin = 6 aerodromes *31 days = 186
No of aerodromes which the number of reports exceeds the threshold
= (6 aerodromes*29 days) + (5 aerodromes*2 days)
= 174 + 10 = 184
March regularity index = 184/186 = 0.9892

2.2 Monitoring of non-scheduled OPMET data

2.2.1 Monitoring of non-scheduled OPMET data should be executed for FK, FV, WC, WS, and WV types of bulletins.

2.2.2 The monitoring results should be presented in bulletin-oriented format, one line per bulletin indicating the abbreviated header (TTAAii CCCC YGGgg), the FIR/UIR where applicable, receipt time and originator.

2.2.3 Example non-routine OPMET monitoring result file formats:

TT	AAii	CCCC	YYGGgg	FIR/UIR	Rx Time	Origin
WS	PF21	NTAA	271004	NTTT	271004	NTAAYMYX
WS	IN90	VIDP	271000	VIDP	271007	VECCYMYX
WS	BW20	VGZR	271100	VGZR	271030	VGZRYMYX
WS	CI31	RCTP	271150	RCTP	271150	RCTPYMYX
WS	MS31	WMKK	272013	WBFC	272013	WMKKYMYX
WS	CI35	ZGGG	272225	ZGZU	272228	ZGGGYZYX
FV	AU01	ADRM	270323		270330	YMMCYMYX
FK	PQ30	RJTD	270500		270504	RJTDYMYX

Explanation of the table:

- *TT: Type of bulletin FK, FV, WC, WS, WV*
- *AAii: Bulletin ID*
- *CCCC: Compiling Station*
- *YYGGgg: Standard time of report*
- *FIR/UIR: ICAO Location indicator of the FIR/UIR or blank (4 spaces) as applicable*

- *RxTime: Time of receipt*
- *Origin: Originator address.*

2.2.4 Analysis of Monitoring Results:

2.2.4.1 Each RODB collects and analyses the relevant result in order to determine the effectiveness and suitability of the quality management system and to highlight any possible improvement to ICAO Regional Office, Bangkok.

2.3 Examples of Monitoring Results – PI Measurements

The following tables show values of Compliance, Availability and Regularity Index for ASIA/PAC OPMET bulletins compiled by the Singapore RODB in March 2005:

TABLE A	**ROBEX Compliance Index**		
	SA	FT	FC
AE31 VECC	0.81	--	
AS31 VABB	---	0.99	
AS31 VTBB	0.96	0.99	
SA32 VABB	--	0.98	
AS32 VTBB	--	0.85	
AU31 YBBN	1.00	0.99	0.97
AU32 YBBN	0.98	0.94	
BN31 OBBI	0.96	0.92	
BN32 OBBI	0.94	0.95	
CI31 ZBBB	0.99	0.99	
CI32 ZBBB	0.99	0.99	
CI41 ZBBB	0.93	0.99	
EG31 HECA	--	0.85	
HK31 VHHH	0.99	0.99	1.00
ID31 WIII	0.74	--	
IN31 VIDP	--	0.97	
IN31 VABB	0.74	--	0.97
IN32 VIDP	0.73	--	
IR31 OIII	0.84	0.93	
JP31 RJTD	1.00	1.00	1.00
JP32 RJTD	1.00	1.00	1.00
KO31 RKSI	1.00	0.96	
ME31 OLBA	--	0.86	
MS31 WMKK	1.00	--	
NZ31 NZKL	0.95	1.00	
PK31 OPKC	0.91	0.80	
SB31 VCCC	0.97	--	
SD31 OEJD	0.95	--	
SR31 WSSS	--	0.98	0.99
SR32 WSSS	--	1.00	
TH31 VTBB	0.67	1.00	
TH32 VTBB	0.76	0.91	
TH33 VTBB	0.75	0.94	

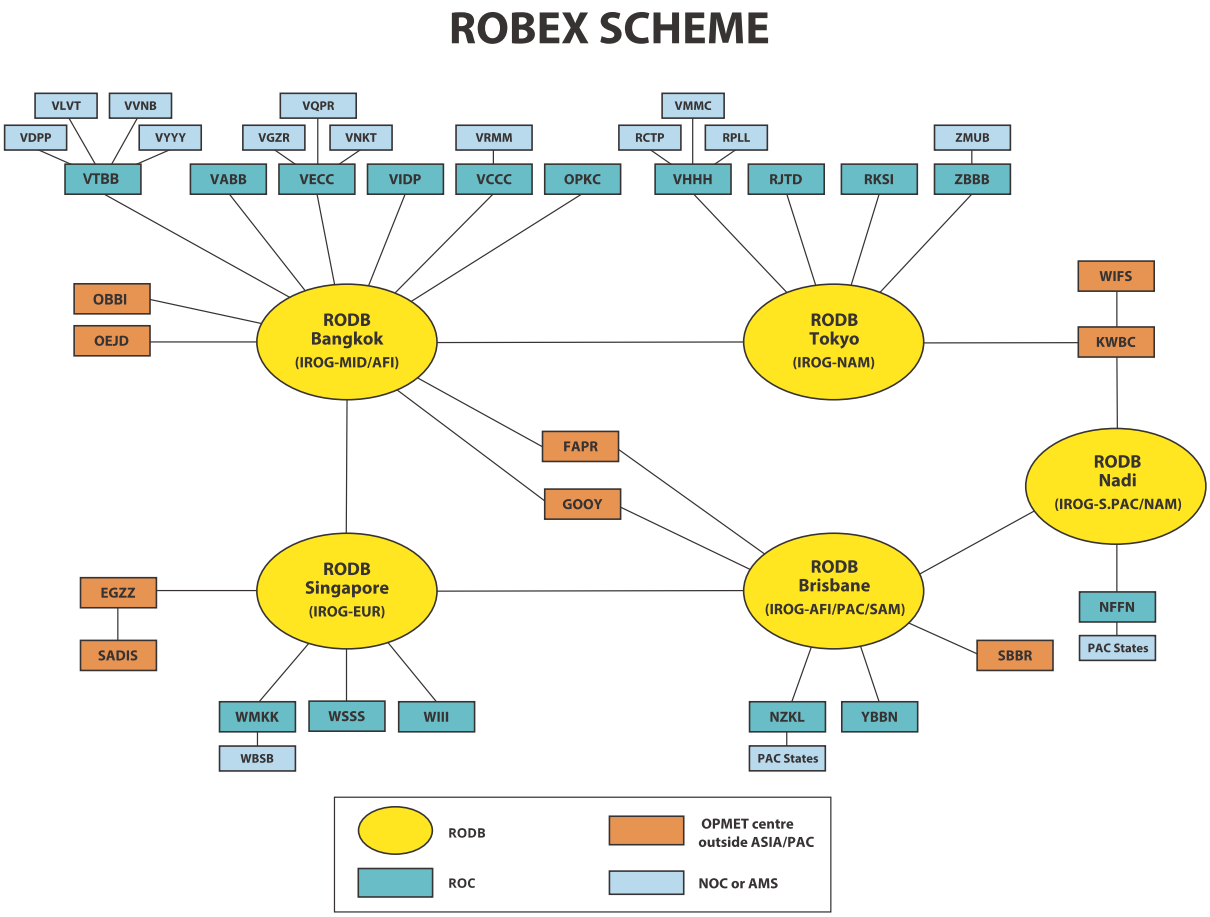
Note: *Entry dashed out (--) means no reports of this type (SA or FT) are required*

TABLE B	**Availability Index**		
	SA	FT	FC
AE31 VECC	0.98	--	
AS31 VABB	--	1.00	
AS31 VTBB	0.99	1.00	
SA32 VABB	--	0.99	
AS32 VTBB	--	0.96	
AU31 YBBN	1.00	1.00	1.00
AU32 YBBN	1.00	1.00	
BN31 OBBI	1.00	1.00	
BN32 OBBI	1.00	0.99	
CI31 ZBBB	1.00	1.00	
CI32 ZBBB	1.00	1.00	
CI41 ZBBB	1.00	1.00	
EG31 HECA	--	1.00	
HK31 VHHH	1.00	1.00	1.00
ID31 WIII	0.98	--	
IN31 VIDP	--	1.00	
IN31 VABB	1.00	--	1.00
IN32 VIDP	0.98	--	
IR31 OIII	1.00	1.00	
JP31 RJTD	1.00	1.00	1.00
JP32 RJTD	1.00	1.00	1.00
KO31 RKSI	1.00	1.00	
ME31 OLBA	--	0.99	
MS31 WMKK	1.00	--	
NZ31 NZKL	--	1.00	
PK31 OPKC	1.00	0.99	
SB31 VCCC	1.00	--	
SD31 OEJD	1.00	--	
SR31 WSSS	--	1.00	1.00
SR32 WSSS	--	1.00	
TH31 VTBB	0.97	1.00	
TH32 VTBB	0.88	1.00	
TH33 VTBB	0.83	1.00	

TABLE C	**Regularity Index**		
	SA	FT	FC
AE31 VECC	0.86	--	
AS31 VABB	--	0.96	
AS31 VTBB	0.93	0.96	
AS32 VABB	--	0.96	
AS32 VTBB	--	0.96	
AU31 YBBN	0.90	0.90	0.96
AU32 YBBN	0.93	0.91	

BN31 OBBI	0.93	0.94	
BN32 OBBI	0.82	0.89	
CI31 ZBBB	0.96	0.94	
CI32 ZBBB	0.93	0.91	
CI41 ZBBB	0.94	0.97	
EG31 HECA	--	0.77	
HK31 VHHH	0.93	0.97	0.85
ID31 WIII	0.92	--	
IN31 VIDP	--	0.84	
IN31 VABB	0.84	--	0.97
IN32 VIDP	0.88	--	
IR31 OIII	0.71	1.00	
JP31 RJTD	1.00	1.00	1.00
JP32 RJTD	1.00	1.00	1.00
KO31 RKSI	0.84	1.00	
ME31 OLBA	--	0.97	
MS31 WMKK	0.98	--	
NZ31 NZKL	0.82	1.00	
PK31 OPKC	0.84	0.97	
SB31 VCCC	0.96	--	
SD31 OEJD	0.89	--	
SR31 WSSS	--	0.99	0.95
SR32 WSSS	--	0.99	
TH31 VTBB	0.92	1.00	
TH32 VTBB	0.85	0.96	
TH33 VTBB	0.89	0.94	

APPENDIX G - ROBEX Scheme Diagram



APPENDIX H – RODB OPMET Interrogation Procedures

This Appendix describes the standard interrogation procedures for access to the designated Regional OPMET Databanks (RODB) in the ASIA/PAC Region. This information was previously provided in the ASIA/PACIFIC OPMET DATA BANKS INTERFACE CONTROL DOCUMENT.

Note: The provision by RODBs of facilities for request/response type of access to the stored OPMET data is primarily for users to obtain non-regular or occasional information and is not intended for routine requests which should be arranged through the efficient implementation of predetermined, regular OPMET exchange.

REQUEST/REPLY MESSAGE FORMAT

1. Request messages

1.1 Request messages should follow the AFTN standard telecommunication procedures as defined in Annex 10, Volume II. The text part of the messages should be as defined in this Appendix.

Note: The standard AFTN message start and end characters and alignment characters (SOH, STX and ETX for ITA-5 format or ZCZC and NNNN for ITA-2 format) have been omitted for clarity in the following examples.

1.2 Request messages should use the AFTN priority **GG.**

1.3 The general format of the request message is as follows:

GG xxxxYZYX
YYGGgg yyyyyyyy
RQM/TTCCCC,(report(s))…/TTAAii, (bulletin(s))…=
RQM/TTCCCC,(report(s))…/TTAAii, (bulletin(s))…=
….

The meaning of the groups and symbols in the request message is as follows:

1.3.1 In the AFTN heading:

GG	priority indicator
xxxxYZYX	AFTN address of the databank
YYGGgg	date-time group specifying the filing time of the request message
yyyyyyyy	AFTN address of the originator of the request

1.3.2 Each data request line is composed of the following elements:

RQM/	indicates the start of a data request line
TT	WMO data type identifier (*refer to 2.7*)
CCCC	4-letter location indicator (as per *ICAO Doc 7910 – Location Indicators*)
	or
AAii	bulletin identifier (*WMO manual 386, table C1 for AA*)
=	indicator of the end of a request line.

1.3.3 Delimiters can be used within a request line as follows:

,	indicates more requests for reports or bulletins for the same data type or different data types for one location;
/	indicates a new data type request within the same data request line.

1.3.4 The length of the request line should not exceed 69 characters including 'RQM' and the '=' signal. Up to ten request lines can be included in one AFTN request message, unless otherwise specified by the RODB.

1.3.5 **Examples of request types**

1.3.5.1 ***Request for one data type at one location***

The format of the request line to obtain one meteorological data type for one location is as follows:

RQM/TTCCCC=

Examples:

1. RQM/SAYSSY=
2. RQM/FCWSSS=

1.3.5.2 ***Request for one data type at two or more locations***

The format of the request line to obtain one meteorological data type for two or more locations is as follows:

RQM/TTCCCC$_1$,CCCC$_2$,.....,CCCC$_n$=

Note: Up to ten locations can be included in a request line.

Examples:

1. RQM/SAYSSY,YBBN,YMML=
2. RQM/FTNZAA,NZCH=

1.3.5.3 ***Request for two or more data types at one location***

The format of the request line to obtain two or more meteorological data types for one location is as follows:

RQM/TT_1CCCC,TT_2,.....,TT_n=

Examples:

1. RQM/SAYMML,FC=
2. RQM/FTNFFN,SA,WC=

1.3.5.4 ***Request for different data types at different locations***

The format of the request line to obtain different meteorological data types for a number of locations is as follows:

RQM/TT_1CCCC,CCCC,…/TT_2CCCC,CCCC,…/...../TT_nCCCC,CCCC, …=

Example:

1. RQM/SAYSSY/FCYBBN,YMML/FTYMML=

1.3.5.5 ***Request for a meteorological bulletin***

The format of the request line to obtain a Meteorological Bulletin is as follows:

RQM/TTAAii=

Examples:

1. RQM/FTAE31=
2. RQM/SATH33=

Note: Only one bulletin can be requested in a RQM request line. Up to six bulletins can be included in a request message

2. Reply messages

2.1 If the AFTN address of the originator of a request is authorised, the databank should automatically reply to the AFTN originator address given in the request message.

2.2 Valid requests for bulletins and/or messages should produce an answer, which should be returned in a standard WMO bulletin format embedded as text in a standard AFTN message. Each bulletin should be sent as a separate message.

2.3 For valid requested bulletin or message(s) belonging to the same type and concerning valid stored messages, one or more reply bulletins should be generated. Non-valid requested groups should be replied by an appropriate *Information* or *Error* reply message.

2.4 In preparing the reply messages by the RODBs the following should apply:

2.4.1 A reply to a METAR request should consist of the latest METAR and/or SPECI reports available for the requested station.

2.4.2 When a request for SIGMET of any type (WS, WC or WV) is received, the reply should contain all valid WS, WV and WC SIGMETs that are available for the FIR concerned.

2.5 Format of the reply message

2.5.1 The WMO abbreviated heading of a reply message will be constructed as:

TTAAii CCCC YYGGgg

where,

TT	the requested (e.g., SA)
AA	**XX** : fixed geographical designator for database reply or as specified by the RODB
ii	**99** : fixed bulletin number for database reply or as specified by the RODB
CCCC	location indicator of the reply database (e.g. VTBB, WSSS, etc.)
YYGGgg	date-time group (DTG) depending on the original DTG of the bulletin header

Note: For the issuing time of TAF and the observation time of METAR the user should refer to the DTG in the reports, which might be different from the DTG in the header.

Example:

SAXX99 VTBB 031200
METAR CCCC 031200Z …
METAR CCCC 031200Z …
…

2.6 Format of the *Information* and *Error* reply messages

2.6.1 RODBs send to the originator of the request an *Information* or *Error* message when a RODB is not in a position to send back valid OPMET data.

2.7 OPMET Data Types

The following meteorological data types, as defined by the WMO data designator indicator, are stored and available on request from the RODBs:

TT	Message Type
SA	METAR
SP	SPECI
FT	12 to 30 HR TAF
WS	SIGMET
WC	Tropical Cyclone SIGMET

WV	Volcanic Ash SIGMET
FV	Volcanic Ash Advisory (VAA)
FK	Tropical Cyclone Advisory (TCA)

APPENDIX I - ROBEX FOCAL POINTS

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