

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**ASIA PACIFIC REGION
ROBEX HANDBOOK**

Thirteenth Edition — March 2019

**Prepared by the ICAO Asia and Pacific Office
and Published under the Authority of the Secretary General**

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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 (WAFIC), 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 character set 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 determined 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
<i>AFTN header</i>	
Priority Indicator and Address Date and Time of filing and Originator	GG VTBBYPYX 271304 ZBBBYPYX
<i>WMO Abbreviated Heading</i>	SACI31 ZBBB 271300
<i>METAR messages</i>	METAR ZBAA 271300Z = METAR ZBTJ 271300Z =
<i>AFTN Normal Ending</i>	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
<i>AFTN header</i>	
Priority Indicator and Address	GG VTBBYPYX
Date and Time of filing and Originator	081647 ZBBBYPYX
<i>WMO Abbreviated Heading</i>	SPCI31 ZBBB 081645
<i>SPECI message</i>	SPECI ZBAA 081645Z =
<i>AFTN Normal Ending</i>	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
<i>AFTN header</i>	
Priority Indicator and Address	GG YBBBYPYX
Date and Time of filing and Originator	271104 ZBBBYPYX
<i>WMO Abbreviated Heading</i>	FTCI31 ZBBB 271100
<i>TAF messages</i>	TAF ZBAA 271100Z 2712/2812.....= TAF ZBTJ 271100Z 2712/2812.....=
<i>AFTN Normal Ending</i>	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 <i>Note that the observation time is used in the METAR report</i>	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 <i>Note 1: The observation time of the METAR is used in the DTG – YYGGgg of the bulletin header.</i> <i>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.</i>	
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	<p>State determines time of the beginning of the validity period for four (4) scheduled TAFs each day, i.e. 00, 06, 12, 18Z.</p> <p><i>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).</i></p> <p>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).</p>	Allow enough time to reach ROC before cut-off time
Bulletin compiling and filing	ROC	<p>Bulletins are compiled during the 15 minutes before filing.</p> <p><i>Note 1: The TAF issuance time (official filing time) is used in the DTG – YYGGgg of the bulletin header</i></p> <p><i>Note 2 : The <u>actual</u> 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.</i></p> <p>TAF should be filed for transmission not earlier than one hour prior to the beginning of their validity period.</p>	<15
Send TAF bulletin to: ROCs (predefined distribution list) RODBs NOCs Other MET offices	ROC <i>via AFTN or AMHS</i>	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 RKSIPYX VTBBYPYX
WSZZWWBX YBBYPYX YPDNYMYX ZJSYMYX
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:

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

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 should 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				
		SATH32	VT SB	SURAT TANI	HH + 00	2300-1400	BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX				
			VT SC	NARATHIWAT		0000-1100		YBBBYPYX				
			VT SE	CHUMPHON/Tab Gai		2300-1400		WSZZYPYM				
			VT SF	NAKHON SI THAMMARAT		0000-1100		RJTDYPYX				
			VT SH	SONGKHLA		2300-1400						
			VT SK	PATTANI		O/R						
			VT SM	SURAT THANI/Samui		0000-1100						
			VT SR	RANONG								
			VT ST	TRANG								
			SATH33	VT UD		UDON THANI		HH + 00	2300-1400	BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX	
		VT UI		SAKON NAKHON/Ban Khai	O/R	YBBBYPYX						
		VT UK		KHON KAEN	2300-1400	WSZZYPYM						
		VT UL		LOEI	O/R	RJTDYPYX						
		VT UO		BURI RAM	O/R							
		VT UQ		NAKHON RATCHASIMA	2300-1400							
		VT UV		ROI ET	O/R							
		VT UW		NAKHON PHANOM	0000-1400							
		VT UJ		SURIN								
		VT UU		UBON RATCHATHANI								
Beijing	ZBBB	SACI31	ZBAA	BEIJING/Capital	HH + 00 HH + 30		BANGKOK BRISBANE SINGAPORE TOKYO Hong Kong Jakarta Karachi Mumbai Incheon Ulaanbaatar	VTBBYPYX				
			ZBSJ	SHIJIAZHUANG/Zhengding				YBBBYPYX				
			ZBTJ	TIANJIN/Binhai				WSZZYPYM				
			ZBYN	TAIYUAN/Wusu				RJTDYPYX				
			ZGGG	GUANGZHOU/Baiyun				VHZZYPYX				
			ZSHC	HANGZHOU/Xiaoshan				WIZZMZBB				
			ZSPD	SHANGHAI/Pudong				OPZZYPYX				
			ZSSS	SHANGHAI/Hongqiao				VABBYPYX				
			ZWSH	KASHI/Kashi				RKSIYPYX				
			ZWWW	URUMQI/Diwopu				ZMUBMYX				
			ZYTL	DALIAN/Zhoushuizi								
			ZYTX	SHENYANG/Taoxian								
			SACI32	ZGKL				GUILIN/Liangjiang	HH + 00		BANGKOK BRISBANE SINGAPORE TOKYO Hong Kong Jakarta Kuala Lumpur Incheon Wellington	VTBBYPYX
				ZGNN				NANNING/Wuxu				YBBBYPYX
				ZGOW				SHANTOU/Waisha				WSZZYPYM
		ZGSZ		SHENZHEN/Baoan	RJTDYPYX							
		ZLXY		XI'AN/Xiayang	VHZZYPYX							
		ZMUB		ULAANBAATAR	WIZZMZBB							
		ZPPP		KUNMING/Wujiaba	WMZZYPYX							
		ZSAM		XIAMEN/Gaoqi	RKSIYPYX							
		ZSFZ		FUZHOU/Changle	NZZZYPYX							
		ZSNB		NINGBO/Lishe								
		ZSQD		QINGDAO/Liuting								
		ZUUU		CHENGDU/Shuangliu								
		SACI41		ZBHH	HOHHOT/Baita	HH + 00		BANGKOK BRISBANE SINGAPORE TOKYO Hong Kong Jakarta Karachi Mumbai Incheon Ulaanbaatar				VTBBYPYX
				ZGHA	CHANGSHA/Huanghua							YBBBYPYX
				ZHCC	ZHENGZHOU/Xinzheng							WSZZYPYM
			ZHHH	WUHAN/Tianhe	RJTDYPYX							
			ZJHK	HAIKOU/Meilan	VHZZYPYX							
			ZJSY	SANYA/Phoenix	WIZZMZBB							
ZLLL	LANZHOU/Zhongchuan		OPZZYPYX									
ZSNJ	NANJING/Lukou		VABBYPYX									
ZSOF	HEFEI/Luogang		RKSIYPYX									
ZUCK	CHONGQING/Jiangbei		ZMUBMYX									

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

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 ZYHB	CHANGCHUN/Longjia HARBIN/Taiping			Wellington	NZZZYPYX
Brisbane	YBBN	SAAU31	YPAD	ADELAIDE/Adelaide Intl	HH + 00 HH + 30		BANGKOK	VTBBYPYX
			YBBN	BRISBANE/Brisbane Intl			BRISBANE	YBBBYPYX
		YMML	MELBOURNE/Melbourne Intl	NADI	NFZZRFXX			
		YPPH	PERTH/Perth Intl	SINGAPORE	WSZZYPYX			
		YSSY	SYDNEY/Sydney (Kingsford Smith) Intl	TOKYO	RJTDYPYX			
						Hong Kong	VHZZYPYX	
						Incheon	RKSIYPYS	
						Jakarta	WIZZYPYX	
						Wellington	NZZZYPYX	
		SAAU32	YBAS	ALICE SPRINGS	HH + 00 HH + 30		BANGKOK	VTBBYPYX
			YMAV	AVALON			BRISBANE	YBBBYPYX
			YBRM	BROOME/Broome Intl			NADI	NFZZRFXX
			YBCS	CAIRNS/Cairns Intl			SINGAPORE	WSZZYPYX
			YSCB	CANBERRA			TOKYO	RJTDYPYX
			YPXM	CHRISTMAS ISLAND			Hong Kong	VHZZYPYX
			YPCC	COCOS (KEELING) ISLAND Intl			Incheon	RKSIYPYS
	YCFS	COFFS HARBOUR	Jakarta	WIZZYPYX				
	YBCG	GOLD COAST	Wellington	NZZZYPYX				
	YMHB	HOBART						
	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 HH+30		BANGKOK	VTBBYPYX		
	YGEL	GERALDTON			BRISBANE	YBBBYPYX		
	YGLA	GLADSTONE			NADI	NFZZRFXX		
	YHID	HORN ISLAND			SINGAPORE	WSZZYPYX		
	YPEA	PEARCE			TOKYO	RJTDYPYX		
	YPJT	PERTH/Jandakot			Hong Kong	VHZZYPYX		
	YPWR	WOOMERA			Incheon	RKSIYPYS		
	YSDU	DUBBO			Jakarta	WIZZYPYX		
	YSRI	RICHMOND, NSW			Wellington	NZZZYPYX		
	YSTW	TAMWORTH						
SAAU34	YBHM	HAMILTON ISLAND			HH+00 HH+30		BANGKOK	VTBBYPYX
	YBMA	MOUNT ISA					BRISBANE	YBBBYPYX
							NADI	NFZZRFXX
							SINGAPORE	WSZZYPYX
					TOKYO	RJTDYPYX		
					Hong Kong	VHZZYPYX		
					Incheon	RKSIYPYS		
					Jakarta	WIZZYPYX		
					Wellington	NZZZYPYX		
SAAU35	YCIN	CURTIN	HH+00 HH+30		BANGKOK	VTBBYPYX		
	YFRT	FORREST			BRISBANE	YBBBYPYX		
	YPKU	KUNUNURRA			NADI	NFZZRFXX		

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

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
			YPGV	GOVE			SINGAPORE TOKYO	WSZZYPYX RJTDYPYX
							Hong Kong Incheon Jakarta Wellington	VHZZYPYX RKSIYPYS WIZZYPYX NZZZYPYX
		SANG31	AYPY AYWK AYVN AYNZ AYMH AYGN AYMO ANYN AGGH	PORT MORESBY Intl WEWAK VANIMO NADZAB MOUNT HAGEN GURNEY MOMOTE NAURU I. HONIARA (HENDERSON)	HH+00	NR NR NR NR NR NR	BANGKOK BRISBANE NADI SINGAPORE TOKYO	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYM RJTDYPYX
							Beijing Hong Kong Jakarta Wellington	ZBBBYPYX VHZZYPYX WIZZMIMI NZZZYPYX
Colombo	VCCC	SASB31	VCBI VCRI VCCH	BANDARANAIKE INTL AP COLOMBO MATTALA RAJAPAKSA INTERNATIONAL AIRPORT HINGURAKGODA/MINNERIYA	HH + 10		BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX YBBBYPYX WSZZYPYM RJTDYPYX
		SAMV31	VRMG VRMH VRMM	GAN INTERNATIONAL AIRPORT HANIMAADHOO INTERNATIONAL AIRPORT MALE INTERNATIONAL AIRPORT			Hong Kong Kuala Lumpur Mumbai	VHZZYPYX WMZZYPYR VABBYPYX
Delhi	VIDP	SAIN32	VIDP VILK VIAR VEBN VIJP	DELHI/Indira Gandhi Intl LUCKNOW AMRITSAR VARANASI JAIPUR	HH + 00 HH + 30		BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX YBBBYPYX WSZZYPYM RJTDYPYX
							Kolkata Hong Kong Karachi Mumbai	VECCYPYX VHZZYPYX OPZZYPYX VABBYPYX
Hong Kong	VHHH	SAHK31	VHHH RCTP RCKH RCSS RCMQ RCNN RCFN VMC RPLL RPVM RPMD RPLB RPLI RPMZ	HONG KONG/International TAIBEI CITY/Taibei Intl Ap GAOXIONG TABELI/Songshan TAICHUNG/Qingquangang TAINAN TAIDONG/Fengnian MACAO/Intl Airport MANILA/Ninoy Aquino Intl LAPU-LAPU/Mactan-Cebu DAVAO/Francisco Bangoy Intl SUBIC BAY, Subic Bay Intl LAOAG, Laoag Intl ZAMBOANGA, Zamboanga Intl	HH + 00 HH + 30	2200-1200 2200-1000 2200-1000 2200-1000	BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX YBBBYPYX WSZZYPYM RJTDYPYX
							Beijing Kuala Lumpur Incheon Wellington	ZBBBYPYX WMZZYPYR RKSIYPYX NZZZYPYX
Incheon	RKSI	SAKO31	RKSI RKSS RKPC RKPK RKTU	INCHEON GIMPO JEJU GIMHAE CHEONGJU	HH + 00 HH + 30		BANGKOK BRISBANE SINGAPORE TOKYO	VTBBYPYX YBBBYPYX WSZZYPYM RJTDYPYX
							Beijing	ZBBBYPYX

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

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	
			RKNY RKTN RKJB	YANGYANG DAEGU MUAN			Hong Kong Singapore Tokyo Wellington Mumbai	VHZZYPYX WSZZYPYM RJTDYPYX NZZZYPYX VABBPYX	
Jakarta	WIII	SAID31	WAAA	UJUNG PANDANG/Hasanuddin	HH + 00 HH + 30	2200-1700	BANGKOK	VTBBYPYX	
			WABB	BLIAK/Frans Kaisiepo			BRISBANE	YBBBYPYX	
			WIHH	JAKARTA/Halimperdana Kusuma			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 HH + 30	2200-0500	BANGKOK	VTBBYPYX	
			WIBB	PEKANBARU/Sultan Syarif Kasim II			BRISBANE	YBBBYPYX	
			WIDN	TANJUNG PINANG/Kijang			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	PRA YA/LOMBOK INTERNATIONAL								
SAID33	WAYY	TIMIKA/Moses Kilangin	HH + 00 HH + 30	2100-0800 2200-0500	BANGKOK	VTBBYPYX			
	WAJJ	JAYAPURA/Sentani			BRISBANE	YBBBYPYX			
	WAKK	MERAUKE/Mopah			SINGAPORE	WSZZYPYM			
	WAPP	AMBON/Pattimura			TOKYO	RJTDYPYX			
	WAHS	SEMARANG/A. Yani			Hong Kong	VHZZYPYX			
	WILL	BANDAR LAMPUNG/Radin Inten			Kuala Lumpur	WMZZYPYR			
WATT	KUPANG/EI Tari	Wellington	NZZZYPYX						
WAQQ	TARAKAN/Juwata			2000-1300					
Kolkata	VECC	SAIN33	VECC	NETAJI SUBHASH CHANDRA BOSE INTERNATIONAL AIRPORT, KOLKATA	HH + 00 HH + 30		BANGKOK	VTBBYPYX	
			VEPT	PATNA			BRISBANE	YBBBYPYX	
			VEGY VEGT	GAYA GUWAHATI			SINGAPORE	WSZZYPYM	
		SABW31	VGEG	M.A. HANNAN INTL. CHITTAGONG			TOKYO	RJTDYPYX	
			VGHS	HAZRAT SHAHJALAL INTERNATIONAL AIRPORT			Colombo	VCCCYPYX	
			VGSY	OSMANI INTERNATIONAL AIRPORT, SYLHET			Delhi	VIDPYPYX	
SAAS31	VNKT	KATHMANDU			Hong Kong	VHZZYPYX			
	VQPR	PARO/Intl.			Karachi	OPZZYPYX			
						Mumbai	VABBPYX		
Karachi	OPKC	SAPK31	OPKC	KARACHI/Jinnah Int'l	HH + 00 HH + 30		BANGKOK	VTBBYPYX	
			OPRN	ISLAMABAD/Chaklala			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

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

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
							Hong Kong Mumbai Tehran	VHZZYPYX VABBYPYX 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 BRISBANE SINGAPORE TOKYO	VTBBYPYX	
			VABB	MUMBAI/Chhatrapati Shivaji Intl.	HH + 30		YBBBYPYX	
			VANP	NAGPUR			WSZZYPYM	
			VOMM	CHENNAI			RJTDYPYX	
			VOTR	TIRUCHCHIRAPPALLI			OMZZYPYX	
			VOTV	TRIVANDRUM			OBZZYPYX	
			VOHS	HYDERABAD			VCCCYPYX	
			VOBL	BANGALORE INTL APT			VIDPYPYX	
			VOCL	CALICUT			VHZZYPYX	
			VOCI	COCHIN INTERNATIONAL			OPZZYPYX	
			VOCB	COIMBATORE			VECCYPYX	
			VOML	MANGALORE			OIZZYPYX	
			Nadi	NFFN	SAPS31		NCRG	RAROTONGA Intl.
NFFN	NADI/Intl					YBBBYPYX		
NFNA	NAUSORI/Intl					NFFNYPYX		
NFTF	FUA'AMOTU INTL.					WSZZYPYM		
NFTV	VAVA'U					RJTDYPYX		
NGFU	FUNAFUTI/Intl					Wellington		
NGTA	TARAWA/Bonriki Intl					NZZZYPYX		
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							

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
			PLCH	CHRISTMAS ISLAND				
		SAPS32	NFTL	HA'APAI	HH+00		BANGKOK BRISBANE NADI SINGAPORE TOKYO Wellington	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYM RJTDYPYX NZZZYPYX
Tokyo	RJTD	SAJP31	RJAA	NARITA Intl	HH + 00		BANGKOK BRISBANE NADI SINGAPORE TOKYO	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYM RJTDYPYX
			RJBB	KANSAI Intl				
			RJCH	HAKODATE				
		RJGG	CHUBU CENTRAIR Intl	HH + 00		Beijing Guam Hong Kong Incheon London Wellington	ZBBBYPYX PGUMCOAX VHZZYPYX RKSIYPYX EGZZMASI NZZZYPYX	
		RJOO	OSAKA Intl					
		RJSS	SENDAI					
		RJTT	TOKYO Intl					
		ROAH	NAHA					
SAJP32	RJCC	SAPPORO/New Chitose	HH + 00		BANGKOK BRISBANE NADI SINGAPORE TOKYO	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYM RJTDYPYX		
	RJFF	FUKUOKA						
	RJFK	KAGOSHIMA						
	RJFU	NAGASAKI						
	RJOA	HIROSHIMA						
	RJFT	KUMAMOTO						
	RJSN	NIIGATA						
	RJFO	OITA						
	RJOB	OKAYAMA						
	RJOT	TAKAMATSU						
	RJNK	KANAZAWA/Komatsu						
	RJNT	TOYAMA						
SAJP38	RJCK	KUSHIRO	HH + 00		BANGKOK BRISBANE NADI SINGAPORE TOKYO	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYM RJTDYPYX		
	RJCM	MEMANBETSU						
	RJCB	OBIHIRO						
	RJOC	IZUMO						
	RJOH	MIHO						
	RJOK	KOCHI						
	RJFM	MIYAZAKI						
	ROIG	ISHIGAKI JIMA						
	RJNS	SHIZUOKA						
	RJSA	AOMORI						
	RJSF	FUKUSHIMA						
	RJOM	MATSUYAMA						
	RJEC	ASAHIKAWA						
	RJSK	AKITA						
	RJAH	HYAKURI						
	RJFR	NEW KITAKYUSHU						
	RJFS	SAGA						
	Wellington	NZKL					SANZ31	NZWN
NZAA			AUCKLAND Intl	HH + 30				
NZCH			CHRISTCHURCH Intl					
		SANZ32	NZQN	QUEENSTOWN	HH + 00 HH + 30		TOKYO NADI	RJTDYPYX NFFNYPYX
						Beijing	ZBBBYPYX	

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
							Hong Kong Incheon Jakarta	VHZZYPYX RKSYPYX 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			
ASIAPAC 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	NZZYPYA		
				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		NA YPYITAW INTERNATIONAL			24	Beijing	ZBBBYPYX	
			VYYY		YANGON INTERNATIONAL			24	Beirut	OLLLYPYX	
									Hong Kong	VHZZYPYX	
						Jeddah	OEJDYPYX				
						Karachi	OPZZYPYX				
						Kuala Lumpur	WMZZYPYR				
						Mumbai	VABBYPYX				
						Incheon	RKSIYPYX				
						Tehran	OIIIYPYX				
						Wellington	NZZYPYA				
		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	NZZYPYA				
		FTAE34	VVC/	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
			VTCTN	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		
			VTPPT	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
			VTSE	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	ZMUBMYX
			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/Xiayang			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	ZMUBMYX
			ZYCC	CHANGCHUN/Longjia			24	Wellington	NZZZYPYX
			ZYHB	HARBIN/Taiping			24		
Brisbane	YBBN	FTAU31	YPAD	ADELAIDE/Adelaide Intl	0535	0600	30	BANGKOK	VTBBYPYX
			YBBN	BRISBANE/Brisbane Intl	1135	1200	30	BRISBANE	YBBBYPYX
			YPDN	DARWIN/Darwin Intl	1735	1800	30	NADI	NFZZRFX
			YVML	MELBOURNE/Melbourne Intl	2335	0000	30	SINGAPORE	WSZZYPYX
			YPPH	PERTH/Perth Intl			30	TOKYO	RJTDYPYX
			YSSY	SYDNEY/Sydney (Kingsford Smith) Intl			30	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 Jakarta Manila Mumbai Wellington	VHZZYPYX WIZZYPYX RPLLYPYX VABBYPYX NZZZYPYX
		FTAU32	YBAS YMAV YBRM YBCS YSCB YPXM YPCC YCFS YBCG YMHB YPKG YMLT YPLM YLHI YSNF YPPD YBRK YPTN YBTL YWLM	ALICE SPRINGS AVALON BROOME/Broome Intl CAIRNS/Cairns Intl CANBERRA CHRISTMAS ISLAND COCOS (KEELING) ISLAND Intl COFFS HARBOUR GOLD COAST HOBART KALGOORLIE-BOULDER LAUNGESTON LEARMONTH LORD HOWE ISLAND NORFOLK ISLAND Intl PORT HEDLAND ROCKHAMPTON TINDAL TOWNSVILLE/Townsville Intl WILLIAMTOWN	0535 1135 1735 2335 - - - - - - - - - - - - - - - -	0600 1200 1800 0000 - - - - - - - - - - - - - - - -	24 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Hong Kong Jakarta Manila Mumbai Wellington	VTBBYPYX YBBBYPYX NFZZRFXX WSZZYPYX RJTDYPYX ZBBBYPYX VHZZYPYX WIZZYPYX RPLLYPYX VABBYPYX NZZZYPYX
		FTAU33	YAMB YSDU YGEL YGLA YHID YPEA YPJT YSRI YSTW YPWR -	AMBERLEY DUBBO GERALDTON GLADSTONE HORN ISLAND PEARCE PERTH/Jandakot RICHMOND, NSW TAMWORTH WOOMERA -	0535 1135 1735 2335 - - - - - - -	0600 1200 1800 0000 - - - - - - -	18 18 18 18 18 18 18 18 18 18 18	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Hong Kong Jakarta Manila Mumbai Wellington	VTBBYPYX YBBBYPYX NFZZRFXX WSZZYPYX RJTDYPYX ZBBBYPYX VHZZYPYX WIZZYPYX RPLLYPYX VABBYPYX NZZZYPYX
		FTAU34	YBHM YBMA - -	HAMILTON ISLAND MOUNT ISA - -	0500 1100 1700 2300 - -	0600 1200 1800 0000 - -	12 12 12 12 12 12	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Hong Kong Jakarta Manila Mumbai Wellington	VTBBYPYX YBBBYPYX NFZZRFXX WSZZYPYX RJTDYPYX ZBBBYPYX VHZZYPYX WIZZYPYX RPLLYPYX VABBYPYX NZZZYPYX
		FTAU35	YGIN YFRT YPGV YPKU	CURTIN FORREST GOVE KUNUNURRA	0100 0700 1300 1900	0200 0800 1400 2000	12 12 12 12	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Hong Kong Jakarta Manila Mumbai Wellington	VTBBYPYX YBBBYPYX NFZZRFXX WSZZYPYX RJTDYPYX ZBBBYPYX VHZZYPYX WIZZYPYX RPLLYPYX VABBYPYX NZZZYPYX
		FTTM31	WPDL WPDB	DILI/Presidente Nicolau Lobato Intl SUAI * * Note: Filing/Start: 2335/0000 & 1735/1800 only	0135 0735 1335 1935	0200 0800 1400 2000	12	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Hong Kong Jakarta Manila Mumbai	VTBBYPYX YBBBYPYX NFZZRFXX WSZZYPYX RJTDYPYX ZBBBYPYX VHZZYPYX WIZZYPYX RPLLYPYX VABBYPYX

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
								Wellington	NZZZYPYX
		FTNG31	AYPY AYWK AYVN AYNZ AYMH AYMO ANYN AGGH	PORT MORESBY Intl WEWAK VANIMO NADZAB MOUNT HAGEN MOMOTE NAURU I. HONIARA (HENDERSON)	0535 1135 1735 2335	0600 1200 1800 0000	24 24 24 24 24 24 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Hong Kong Jakarta Manila Mumbai Wellington	VTBBYPYX YBBBYPYX NFZZRFXX WSZZYPYX RJTDYPYX ZBBBYPYX VHZZYPYX WIZZYPYX RPLLYPYX VABBYPYX NZZZYPYX
Hong Kong	VHHH	FTHK31	VHHH RCTP RCKH RCSS RCMQ RCNN RCFN VMC RPLL RPVM RPM RPLB RPMZ RPLI	HONG KONG/International TAIBEI CITY/Taibei Intl Ap GAOXIONG TAIBEI/Songshan TAICHUNG/Qingquangang TAINAN TAIDONG/Fengnian MACAOU/Intl Airport MANILA/Ninoy Aquino Intl, Pasay City, Metro Manila LAPU-LAPU/Mactan, Cebu DAVAO/Francisco Bangoy Intl, Davao Del Sur SUBIC BAY, Subic Bay Intl, Olongapo City, Zambales ZAMBOANGA, Zamboanga Intl, Zamboanga Del Norte LAOAG, Laoag Intl, Ilocos Norte	0535 1135 1735 2335	0600 1200 1800 0000	30 30 30 24 24 24 30 30 24 24 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing Mumbai Incheon Wellington London Washington	VTBBYPYX YBBBYPYX NFFNYMYX WSZZYPYX RJTDYPYX ZBBBYPYX VABBYPYX RKSIPYX NZZZYPYA EGZMASI KWBCYMYX
Incheon	RKSI	FTKO31	RKSI RKSS RKPC RKPK RKTU RKNY RKTN RKJB	INCHEON Intl GIMPO Intl JEJU Intl GIMHAE Intl CHEONGJU Intl YANGYANG Intl DAEGU INTL MUAN Intl	0535 1135 1735 2335	0600 1200 1800 0000	30 30 30 30 30 30 30 30	BANGKOK BRISBANE SINGAPORE TOKYO Hong Kong Karachi Wellington	VTBBYPYX YBBBYPYX WSZZYPYX RJTDYPYX VHZZYPYX OPZZYPYX NZZZYPYX
Karachi	OPKC	FTPK31	OPKC OPRN OPLA OPNH OPPS OPGD OPSK	KARACHI/Jinnah Intl ISLAMABAD/Chaklala LAHORE/Allama Iqbal Int'l NAWABSHAH PESHAWAR GWADAR SUKKAR	0535 1135 1735 2335	0600 1200 1800 0000	30 30 30 30 24 24	BANGKOK BRISBANE SINGAPORE TOKYO Abu Dhabi Bahrain Beijing Beirut Hong Kong Jeddah Karachi Tehran	VTBBYPYX YBBBYPYX WSZZYPYX RJTDYPYX OMZZYPYX OBZZYPYX ZBBBYPYX OLLLYPYX VHZZYPYX OEJDYPYX OPZZYPYX OIIYPYX
Mumbai	VABB	FTIN31	VAAH VABB VANP VOBL VOCB VOCI VOCL VOHS VOML VOMM VOTR VOTV	AHMEDABAD MUMBAI/Chhatrapati Shivaji Intl. NAGPUR BANGALORE INTL APT COIMBATORE COCHIN INTERNATIONAL AIRPORT CALICUT HYDERABAD INTERNATIONAL AIRPORT MANGALORE CHENNAI TIRUCHCHIRAPPALLI TRIVANDRUM	0535 1135 1735 2335	0600 1200 1800 0000	30 30 30 30 30 30 30 30 30 30 30	BANGKOK BRISBANE SINGAPORE TOKYO Abu Dhabi Bahrain Beijing Beirut Hong Kong Jeddah Karachi Tehran	VTBBYPYX YBBBYPYX WSZZYPYX RJTDYPYX OMZZYPYX OBZZYPYX ZBBBYPYX OLLLYPYX VHZZYPYX OEJDYPYX OPZZYPYX OIIYPYX
		FTIN32	VIDP VEBN VIAR VIJP VILK	DELHI/Indira Gandhi Intl VARANASI AMRITSAR JAIPUR LUCKNOW	0535 1135 1735 2335	0600 1200 1800 0000	30 30 30 30 30		

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1 ROC		2 TAF Bulletin						3 Dissemination				
Name	CCCC		CCCC	Aerodrome	Filing time	Start of validity	TAF validity	RODB/ROC	AFTN address			
		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					
			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	NFZZRFX			
			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	NFZZRFX			
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			
								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			
		FTSR33	WBSB	BRUNEI/Intl	0535	0600	30					
			WBGB	BINTULU	1135	1200	24					
			WBGG	KUCHING/Intl	1735	1800	24					

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1 ROC		2 TAF Bulletin						3 Dissemination			
Name	CCCC		CCCC	Aerodrome	Filing time	Start of validity	TAF validity	RODB/ROC	AFTN address		
			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		
			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			

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1 ROC		2 TAF Bulletin						3 Dissemination	
Name	CCCC		CCCC	Aerodrome	Filing time	Start of validity	TAF validity	RODB/ROC	AFTN address
		FTNZ32	NZQN	Queenstown	1130 1730	1200 1800	18		

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 communicate 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:

T₁T₂A₁A₂ii CCCC YYGGgg (BBB)

2. Explanation of the symbols
 - 2.1. **T₁T₂A₁A₂ii** – 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 **T₁T₂** - 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 **A₁A₂** - 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 A₁A₂ 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 A₁A₂ 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.

A₁A₂	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 ₁ A 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 VOCL 170900Z 1712/1818 33005KT 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 - 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 RKSIIYPYX 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):	METNO APAC OPMET YYMMDD
New Bulletin (NEWBUL)	NEWBUL (description of new bulletin and content)
Delete Bulletin (DELBUL)	DELBUL (description of bulletin to be deleted and content)
Add Report to existing bulletin (ADDRPT)	ADDRPT (description of added aerodromes to existing bulletin)
Remove Report from existing bulletin (RMVRPT) + Bulletin/Report key (TTAAii CCCC Station)(1)	RMVRPT (description of aerodromes to be deleted from existing bulletin)
End of METNO	END=

(1) The METNO Bulletin/Report reference only contains the Bulletin/Report index TTAAii CCCC₁ CCCC₂ where:

- TTAAii is the abbreviated header
- CCCC₁ the compiling centre
- CCCC₂ 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=

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

1.1.4 TAF Validation

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 ₁ Y ₁ G ₁ G ₁ /Y ₂ Y ₂ G ₂ G 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 SIGMET for VA SIGMET for TC	WS WV WC
Validity Period DDHHMM/DDHHMM	Shall have a valid period of validity. Validity periods may be corrected if: <ul style="list-style-type: none"> • 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
<p>SIGMET without TTAAii:</p> <p>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=</p>	<p>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=</p>
<p>SIGMET with incorrect number format</p> <p>WCPH30 RPLL 210445 SIGMET NO 01 VALID 210000/210600 RPLL TC OBS N0830 E12900=</p>	<p>WCPH30 RPLL 210445 SIGMET 01 VALID 210000/210600 RPLL TC OBS N0830 E12900 ... =</p>
<p>SIGMET with incorrect formatted validity period:</p> <p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID 18/1600 TO 18/2000 UTC VIDP- DELHI FIR EMBD TS ... =</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID 220500 TO 220900 OEJN- JEDDAH FIR=</p>	<p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID 181600/182000 VIDP- DELHI FIR EMBD TS ... =</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID 220500/220900 OEJN- JEDDAH FIR ... =</p>

1.2

Quality Control Methods

OPMET Data	Elements Defining	Control Methods
<p>METAR METAR COR SPECI (SA,SP)</p>	<ul style="list-style-type: none"> • AHL • Code name • Observation date/time 	<p>Software verification</p> <p>Manual validate</p> <p>Periodic Quality Control & PI Monitoring</p>
<p>TAF TAF AMD TAF COR (FT,FC)</p>	<ul style="list-style-type: none"> • 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 	<p>Software verification</p> <p>Manual validate</p> <p>Periodic Quality Control & PI Monitoring</p>
<p>SIGMET (WS, WC, WV)</p>	<ul style="list-style-type: none"> • AHL • SIGMET Sequence No • Date/time groups indicating the period of validity <p>Additional Checks (recommended):</p>	<p>Software verification</p> <p>Manual validate</p> <p>Periodic SIGMET Quality Control Monitoring</p>

	<ul style="list-style-type: none"> Name of the FIR or the CTA the message is issued for Location indicator of the MWO originating the message 	
Volcanic Ash Advisory FV	<ul style="list-style-type: none"> Type of message Issue date and time <p>Additional Checks (recommended):</p> <ul style="list-style-type: none"> Location indicator or name of the VAAC centre originating the message 	<p>Software verification</p> <p>Manual validate</p> <p>Periodic VA Quality Control Monitoring</p>
Tropical Cyclone Advisory FK	<ul style="list-style-type: none"> Type of message Issue date and time <p>Additional Checks (recommended):</p> <ul style="list-style-type: none"> Location indicator or name of the TCAC centre originating the message 	<p>Software verification</p> <p>Manual validate</p> <p>Periodic TC Quality Control Monitoring</p>

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:

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

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., $288/288 + 240/288 + 288/288 + \dots + 288/288 \Rightarrow$ (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 $2 \times 24 = 48$ 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
 $= (6 \text{ aerodromes} \times 48 \text{ reports} \times 30 \text{ days}) + (5 \text{ aerodromes} \times 48 \text{ reports} \times 1 \text{ day})$
 $= 8,640 + 240$
 $= 8,880$
 No. of reports required for a bulletin
 $= (6 \text{ aerodromes} \times 48 \text{ reports} \times 31 \text{ days}) = 8,928$
 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:

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

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., $6/6 + 6/6 + 6/6 + 5/6 + 4/6 + 6/6 + \dots + 2/6 \Rightarrow$ (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 Bulletin 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:

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

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 $\tau = 8.8-1.304 = 7.45$ 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., $6/6 + 6/6 + 6/6 + 5/6 + 4/6 + 6/6 + \dots + 2/6 \Rightarrow$ (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	YGGgg	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
- YGGgg: 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

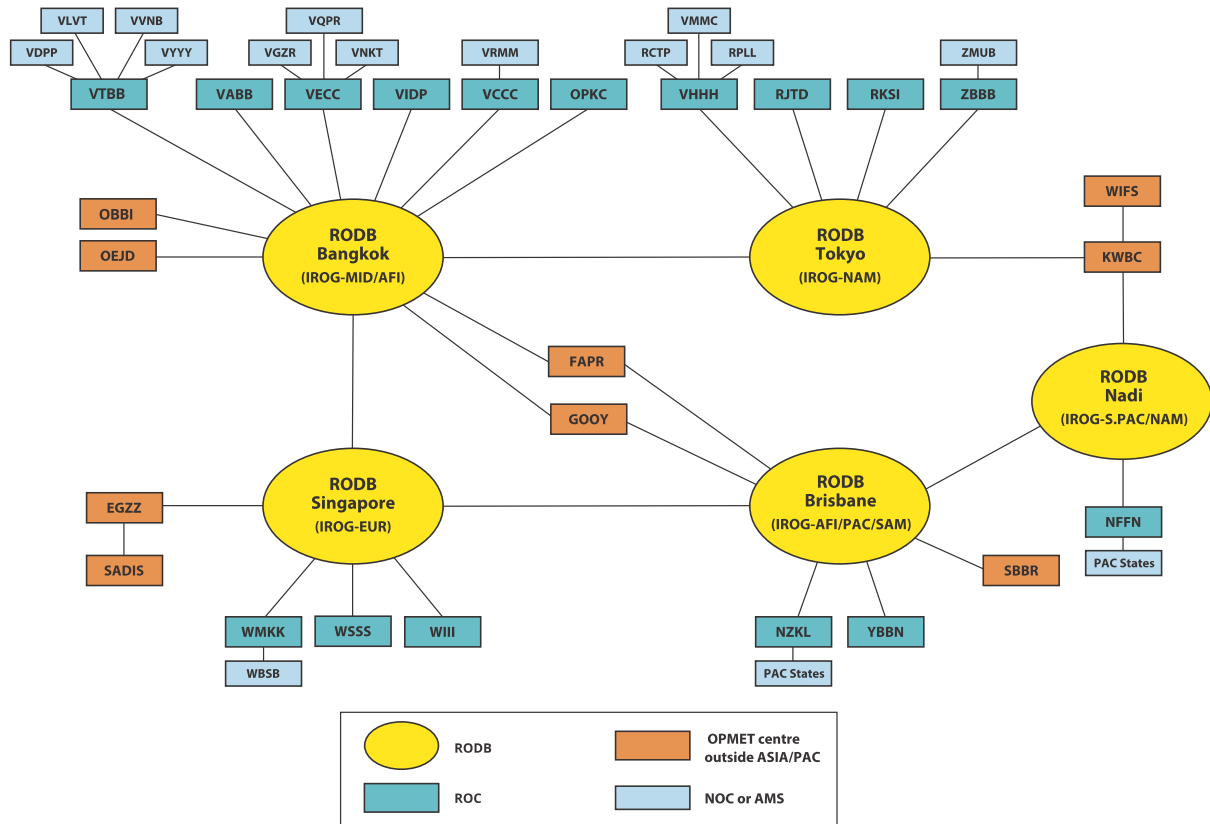
TABLE B	Availability Index		
	SA	FT	FC
AE31 VECC	0.98	--	
AS31 VABB	--	1.00	
AS31 VTBB	0.99	1.00	
SA32 VABB	--	0.99	
AS32 VTBB	--	0.96	
AU31 YBBN	1.00	1.00	1.00
AU32 YBBN	1.00	1.00	
BN31 OBBI	1.00	1.00	
BN32 OBBI	1.00	0.99	
CI31 ZBBB	1.00	1.00	
CI32 ZBBB	1.00	1.00	
CI41 ZBBB	1.00	1.00	
EG31 HECA	--	1.00	
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

ROBEX SCHEME



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
YGGgg yyyyyyy
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
YGGgg	date-time group specifying the filing time of the request message
yyyyyy	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 (<i>refer to 2.7</i>)
CCCC	4-letter location indicator (as per <i>ICAO Doc 7910 – Location Indicators</i>)
	or
AAii	bulletin identifier (<i>WMO manual 386, table C1 for AA</i>)
=	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/TTCCCC₁,CCCC₂,.....,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/TT₁CCCC,TT₂,.....,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/TT₁CCCC,CCCC,.../TT₂CCCC,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

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
AUSTRALIA	Mr. Tim Hailes National Manager Regional Aviation Weather Services Weather Policy Branch Australian Bureau of Meteorology GPO Box 1289 Melbourne VIC 3001	Tel: +61 (0) 3 9669 4273 Fax: +61 (0) 4 2784 0175 e-mail: t.hailes@bom.gov.au , sral@bom.gov.au
	Mr. Pierre Kemmers Network Operations Line Manager Airservices Australia GPO Box 367 Canberra ACT 2601	Tel: +61 2 6268 5662 Fax: TBA e-mail: asa_ncc_supervisor@airservicesaustralia.com
CHINA	Mr. Xu Jianliang Senior Engineer MET Division of ATMB Civil Aviation Authority of China Air Traffic Management Bureau 12# East San-huan Road Middle Chaoyang District Beijing 100022	Tel: +86 (10) 7786827 Fax: +86 (10) 87786820 e-mail: xujl@atmb.net.cn
HONG KONG CHINA	Ms. Miranda NG Senior Aeronautical Communications Supervisor Telecommunications Unit of Air Traffic Management Division Room 315, 3/F, Office Building, Civil Aviation Department Headquarters 1 Tung Fai Road, Hong Kong International Airport Lantau, Hong Kong, China	Tel: +852 2910 6201 Fax: +852 2910 1160 e-mail: mailto:wmg@cad.gov.hk
	Mr. B.L. Choy Hong Kong Observatory	Tel : +852 2926 8350 Fax : +852 2311 9448 e-mail : blchoy@hko.gov.hk
FIJI	Mr. William L. REECE Aeronautical Technical Officer – ATM Airports Fiji Limited P.O. Box 9210 Nadi Airport	Tel: +679 (6) 731198 Fax: +679 e-mail: williamr@afl.com.fj
INDIA	Mr. M. K. Bhatnagar Director Aviation Services India Meteorological Dept. New Delhi	Tel: Fax: e-mail: bhatnagarmk1@gmail.com

Administration units OPMET/ROBEX

Director General of Meteorology
 India Meteorological Department
 Lodi Road, New Delhi – 110 003
 India

INDONESIA

Mr. Mustari Heru Jatmika
 Head of Aeronautical Meteorology Division
 Indonesian Meteorological Climatological
 and Geophysical Agency
 Jalan Angkasa I No.2 Kemayoran, Jakarta,
 Indonesia - 10720

Tel : +62 (21) 4246321
 Fax : +62 (21) 6546315
 e-mail: emhadjatmiko@yahoo.co.id
heru1959@gmail.com

Mr. Zulkarnain
 Senior Forecaster of Aeronautical
 Meteorology
 Aeronautical Meteorology Division
 Indonesian Meteorological Climatological
 and Geophysical Agency
 Jalan Angkasa I No.2 Kemayoran, Jakarta,
 Indonesia - 10720

Tel : +62 (21) 6546318
 Fax : +62 (21) 6546315
 e-mail : zulkarnain@bmkg.go.id
cillo_85@yahoo.com

JAPAN

Mr. Kentaro Tsuboi
 Scientific Officer
 Information and Communications
 Technology Division
 Forecast Department
 Japan Meteorological Agency (JMA)
 1-3-4 Otemachi, Chiyoda-ku
 Tokyo 100-8122

Tel: +81 (3) 3212-8341 (ext, 3283)
 Fax: +81 (3) 3211 8404
 e-mail: k-tsuboi@met.kishou.go.jp

MALAYSIA

Dr. Wan Azli Wan Hassan
 Director
 National Meteorological Aviation Centre
 Kuala Lumpur International Airport
 1st Floor, Airport Management
 64000 Sepang, Selangor Darul Ehsan

Tel: +60 (3) 8787239
 Fax: +60 (3) 87871019
 e-mail: wanzli@met.gov.my

Administration units OPMET/ROBEX

Mr. Lim Ze Hui
 Assistant Director
 Sabah, Tingkat 7, Wisma Dang Bandang
 8800 Kota Kinabalu Sabah
 Malaysia

Tel: +60 (88) 256054
 Fax: +60 (88) 211019
 e-mail: mailto:zhlim@met.gov.my

NEW ZEALAND

Mr. Keith Mackersy
 Senior Meteorological Specialist
 Civil Aviation Authority of New Zealand
 PO Box 3555
 Wellington 6140
 NEW ZEALAND

Tel: +64 4 560 9400
 Fax: +64 4 569 2024
 e-mail: keith.mackersy@caa.govt.nz

PAKISTAN

Mr. M. Fasih-Uz-Zaman Khan
Acting General Manager Com-Ops.
Communication Operations Branch
Technical Division
Terminal 1, HQ CAA
JIAP Karchi

Tel: +92 (21) 9248732
Fax: +92 (21) 9248733
e-mail: aftnophq@cyber.net.pk

Administration units OPMET/ROBEX

General Manager
Communication Operations Branch
Technical Division
Terminal 1, HQ CAA
JIAP Karchi

Mr. Sarfaraz
Senior Meteorologist
Meteorological Office Room No. 3106
JTC, Jinnah International Airport
Karachi

Tel: +92 (21) 45791322
+92 (21) 45791300
Fax: +92 (21) 9248282
+92 (21) 8112885
e-mail: pmdmocar@khi.paknet.com.pk

Administration units OPMET/ROBEX

Main Meteorological Office
Jinnah International Airport
Karachi

PAPUA NEW GUINEA

Mr. Tau Gabi
National Weather Service
Port Moresby
PNG

Tel:
Fax:
e-mail: tgabi@png.met.gov.pg

REPUBLIC OF KOREA

Mr. Kim Mi-Hee
Assistant Director
Aviation Meteorological Office of Korea
Meteorological Administration
(AMO/KMA)
Observation and Forecast Division
272 Gonghang-ro, Jung-gu
Incheon, 22382 (P.O. Box 43)

Tel: +82 (32) 7402850
Fax: +82 (32) 7402847
e-mail: kimmh99@korea.kr

Ms. Lee Min-Ja
Senior Meteorologist
Aviation Meteorological Office of Korea
Meteorological Administration
(AMO/KMA)
Observation and Forecast Division
272 Gonghang-ro, Jung-gu
Incheon, 22832 (P.O. Box 43)

Tel: +82 (32) 740 2820
Fax: +82 (32) 740 2807
e-mail: manja78@korea.kr

Administration units OPMET/ROBEX

Aviation Meteorological Office of Korea
Meteorological Administration
(AMO/KMA)
272 Gonghang-ro, Jung-gu
Incheon, 22382 (P.O. Box 43)
(Location Indicator : RKSIIYPYX)

SINGAPORE Mr Chow Kwok Wah
Principal Meteorologist, Central Forecast
Office
P.O. Box 8
Singapore Changi Airport
Singapore 918141

Tel: +65 6542 4715
Fax: +65 6542 7192
e-mail: chow_kwok_wah@nea.gov.sg

Administration units OPMET/ROBEX

Central Forecast Office/Weather Services
Department
P.O. Box 8
Singapore Changi Airport
Singapore 918141

SRI LANKA Mr. E. S. Silva
Meteorologist in charge
Katunayake International Airport
Colombo
Sri Lanka

Tel: +94 11 2252721
Fax: +94 11 2252319
e-mail: meteo3@sltnet.lk

THAILAND Ms. Sujin Promduang
Director, Aeronautical Information and
Flight Data Management Centre
Aeronautical Radio of Thailand Ltd.,
102 Soi Ngamduplee, Tunkmahamek
Sathorn, Bangkok 10120

Tel: +66 (2) 2859083
Fax: +66 (2) 2878645
e-mail: sujin@aerorhai.co.th

Mr. Somchai Yimsricharoenkit
Head of Aeronautical Meteorology
Civil Aviation Authority of Thailand
333/105 Lak Si Plaza
Khamphaeng Phet 6 Road
Talat Bang Khen, Lak Si
Bangkok 10210

Tel: +66 (2) 568 8825
Fax: +66 (2) 568 8847
e-mail: somchai.y@caat.or.th

USA Mr. Walter Smith
National Weather Service

Tel:
Fax:
e-mail: Walter.Smith@noaa.gov

TBA
TBA
TBA

Tel: +1 (202) 385-7704
Fax: +1 (202) 385-7701
e-mail:

Federal Aviation Administration
Weather Policy and Standards
800 Independence Ave SW
Washington, D.C. 20591