

**INTERNATIONAL CIVIL AVIATION ORGANIZATION**



**ASIA PACIFIC  
ROBEX HANDBOOK**

**Seventeenth Edition — July 2024**

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

**RECORD OF AMENDMENTS AND CORRIGENDA**

<b>Amendments</b>			
No.	Date of issue	Date entered	Entered by
1	21/02/2025	07/03/2025	P. Dunda [APPENDIX F, para 2.1.2.1]
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<b>Corrigenda</b>			
No.	Date of issue	Date entered	Entered by

**LIST OF UPDATES IN THE ICAO APAC ROBEX HANDBOOK, 17<sup>th</sup> EDITION, JULY 2024,  
COMPARED WITH THE 16<sup>TH</sup> EDITION, APRIL 2024**

Updates approved by the ICAO APAC Twenty-eighth Meeting of the Meteorology Sub-Group ([MET SG/28](#)), Bangkok, Thailand, 8 – 12 July 2024

SECTION	REFERENCES	UPDATES
5	MET SG/28; ACTION 28/19 and Flimsy/02	Insert SWXA in first bullet point in para 5.2.5; and Insert new para 5.2.7 as provided in MET SG/28, Flimsy/02
8	MET SG/28; ACTION 28/19 and Flimsy/02	Insert new para 8.8 as provided in MET SG/28, Flimsy/02
13.1	MET SG/28; Decision MET SG/28-09 and WP/09	Editorial changes to para 13.1.3 as provided in MET SG/28, WP/09.
13.3	MET SG/28; Decision MET SG/28-09 and WP/07	Change the number of PIs from three to two in paras 13.3.1.1 and 13.3.1.2; Delete Compliance and Regularity indices in para 13.3.1.1; Add Timeliness index in para 13.3.1.1.
APPENDIX A/ TABLE A	MET SG/28; Decision MET SG/28-09 and email from Indonesia	<b>In [Bul. No.] SAID33:</b> Delete the following [CCCC][Aerodrome]: WAKK, Mopah Merauke
APPENDIX B/ TABLE B	MET SG/28; Decision MET SG/28-09 and IP/03	<b>In [Bul. No.] FTIC31:</b> Change TAF validity from 24 to 30 for the following [CCCC][Aerodrome]: ZSSS, SHANGHAI/Hongqiao
APPENDIX E	MET SG/28; Decision MET SG/28-09 and WP/09	Editorial changes from section 1 to section 4 as provided in MET SG/28, WP/09.
APPENDIX F	MET SG/28; Decision MET SG/28-09; WP/07 and ACTION 28/09	Replace the entire section 2, paras 2.1 to 2.3 with new paras 2.1 to 2.2.2.8.1; Editorial changes as indicated in MET SG/28, ACTION 28/09.

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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
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
SWX	Space Weather
SWXC	Space Weather Centre
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 following:

- 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; and
- **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>).

2.4.4 To facilitate OPMET Data Exchange using IWXXM in the APAC region, the Meteorology Sub-Group (MET SG) of APANPIRG decided to include in this handbook the following link to the online register of the status of IWXXM exchange in the APAC Region [MET SG/24, Decision MET SG/24-15 and Conclusion MET SG/24-12, refer]:

[Online Register of APAC IWXXM Exchange Status](#)

[<https://docs.google.com/spreadsheets/d/1WEcGfMRZq2dgHsfdpFhiefJEcA8OeMhfbCJHTqA7NX0/edit#gid=0>]

## 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 a predetermined 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 provided 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	SA	LA
	SPECI	SP	LP
Aerodrome forecasts	TAF: 12 to 30 hour	FT	LT
SIGMET information	SIGMET	WS	LS
	SIGMET for TC	WC	LY
	SIGMET for VA	WV	LV
AIRMET information	AIRMET	WA	LW
Volcanic Ash and Tropical Cyclone Advisories	Volcanic Ash Advisory	FV	LU
	Tropical Cyclone Advisory	FK	LK
Air-reports	AIREP SPECIAL (ARS)	UA	N/A
Space Weather Advisory	SWX ADVISORY	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; and
- **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 the collection of messages from the originating stations, compiling of bulletins and their dissemination according to predetermined distribution schemes. The collection and distribution are 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 [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 also serve 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; and
- 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 (WAFS), 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, SWXA and TAF AMD; and
- 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*, which is available on the following ICAO APAC Office website (click on MET):

<https://www.icao.int/APAC/Pages/edocs.aspx>.

5.2.7 ROCs are responsible for managing the distribution of the IWXXM-formatted OPMET bulletins to other OPMET centres within APAC that are capable of receiving and processing IWXXM information. Being capable includes having access to AMHS/FTBP and being configured to receive IWXXM.

- ROC is responsible for managing collation of IWXXM-formatted OPMET bulletins from NOCs under its area of responsibility (AoR), and disseminating them to all other capable ROCs in the APAC Region.
- ROC is also responsible for managing collation of IWXXM-formatted OPMET bulletins from other ROCs in the APAC Region and disseminating to capable NOCs under its AoR for further distribution to users.
- Originating centres need to send IWXXM formatted OPMET bulletins to their corresponding ROC.

## 6. METAR/SPECI EXCHANGE

### 6.1. General

6.1.1 Routine METAR reports should be prepared for the international aerodromes listed in the *ANP, 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, is 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 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) strictly.

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. When necessary, a corrected message should be sent immediately after an error in an already transmitted message has 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	GG VTBBYPYX
Date and Time of filing and Originator	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>	

Parts of Message	ROBEX SP Bulletin
Priority Indicator and Address	GG VTBBYPYX
Date and Time of filing and Originator	081647 ZBBBYPYX
<b>WMO Abbreviated Heading</b>	SPCI31 ZBBB 081645
<b>SPECI message</b>	SPECI ZBAA 081645Z ..... =
<b>AFTN Normal Ending</b>	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 *ANP, 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 ANP, 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 *ANP, 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 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 has 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-off 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:

<b>METAR observation, compiling and filing</b>			
<b>Function</b>	<b>Responsible Entity</b>	<b>Explanation of Time</b>	<b>Time of task (min)</b>
METAR Observation	Originating stations (AMS, AMO, forecast office)	The 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 the 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 <i>via AFTN or AMHS</i>	Less than 5 minutes	<5
Acceptable time from observation at originating stations to reception by the user			<10

<b>TAF issuance, compiling and filing</b>			
<b>Function</b>	<b>Responsible Entity</b>	<b>Explanation of Time</b>	<b>Time of task (min)</b>
TAF Issuance	AMO or NOC	The State determines the time of the beginning of the validity period for four (4) scheduled TAFs each day, i.e. 00, 06, 12, 18Z.  <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>  TAF is sent to ROC before the cut-off time of accepting TAF for filing as indicated in	Allow enough time to reach ROC before the cut-off time

TAF issuance, compiling and filing			
Function	Responsible Entity	Explanation of Time	Time of task (min)
		<a href="#">Appendix B</a> (typically 5 minutes before filing).	
Bulletin compiling and filing	ROC	Bulletins are compiled during the 15 minutes before filing.  <i>Note 1: The TAF issuance time (official filing time) is used in the DTG – YYGGgg of the bulletin header</i>  <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>  TAF should be filed for transmission not earlier than one hour prior to the beginning of their validity period.	<15
Send TAF bulletin to: ROCs (predefined distribution list) RODBs NOCs Other MET offices	ROC via AFTN or AMHS	In less than 5 minutes	<5
Acceptable time for ROC compiling and filing to reception by the 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 *ANP, 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.

8.8 ROCs are responsible for the distribution of the IWXXM-formatted SIGMET, TCA and VAA.

- ROC is responsible for collecting IWXXM-formatted SIGMET, TCA and VAA from NOCs under its area of responsibility (AoR), and disseminating them to all other ROCs in the APAC Region.
- ROC is also responsible for collecting IWXXM-formatted SIGMET, TCA and VAA from other ROCs in the APAC Region and disseminating to NOCs under its AoR for further distribution to users.
- Originating centres need to send IWXXM formatted SIGMET, TCA and VAA to their corresponding ROC.

## 9. DISSEMINATION OF SPACE WEATHER (SWX) ADVISORIES

### 9.1 Message Routing – Originating Region

#### Space Weather Advisory Centre (SWXC)

9.1.1 The SWXCs are the data originator. They produce the SWX Advisories in TAC form and in IWXXM form. They will send the SWX Advisories to their associated NOCs.

#### National OPMET Centre (NOC)

9.1.2 The role of the NOC is to gather OPMET messages, compile national data into bulletins, validate the bulletin structure and distribute them according to the regional distribution schema. As necessary, the NOC associated with the SWXC (the Originating NOC) will add the Bulletin (WMO) header and send it to all other SWXCs. The Originating NOC will also send the SWX Advisories to its associated ROC via the AFS and will distribute, or make available via agreed State briefing services, the SWX Advisories to users within its national area of responsibility (AOR).

#### Regional OPMET Centre (ROC)

9.1.3 An originating ROC is responsible for the collection of the SWX Advisories from the originating NOC and for the validation of the SWX Advisories' message format. The originating ROC will then disseminate the SWX Advisories, via AFS, to the IROGs, RODBs, and all other ROCs within its Region, and to SADIS/WIFS.

#### Inter-Regional OPMET Gateway (IROG)

9.1.4 The IROGs in the originating Regions are responsible for the collection of the SWX Advisories and dissemination of the SWX Advisories to their partner IROGs in other Regions.

## 9.2 Message Routing – Receiving Region

### Inter-Regional OPMET Gateway (IROG)

9.2.1 The receiving IROG is responsible for the collection of the SWX Advisories and dissemination of the SWX Advisories to its associated ROCs and RODBs in its Region.

### Regional OPMET Centre (ROC)

9.2.2 A ROC will receive SWX Advisories from other Regions via its associated IROG. In turn, the ROC will distribute the SWX Advisories to all its associated NOCs.

### National OPMET Centre (NOC)

9.2.3 The NOC will distribute the SWX Advisories, or make them available via agreed State briefing services, to users within its national area of responsibility (AOR). The distribution may be via a "Push" service (e.g. AFTN, AMHS), a "pull" service (e.g. an internet-based briefing service) or by other methods agreed to within the State.

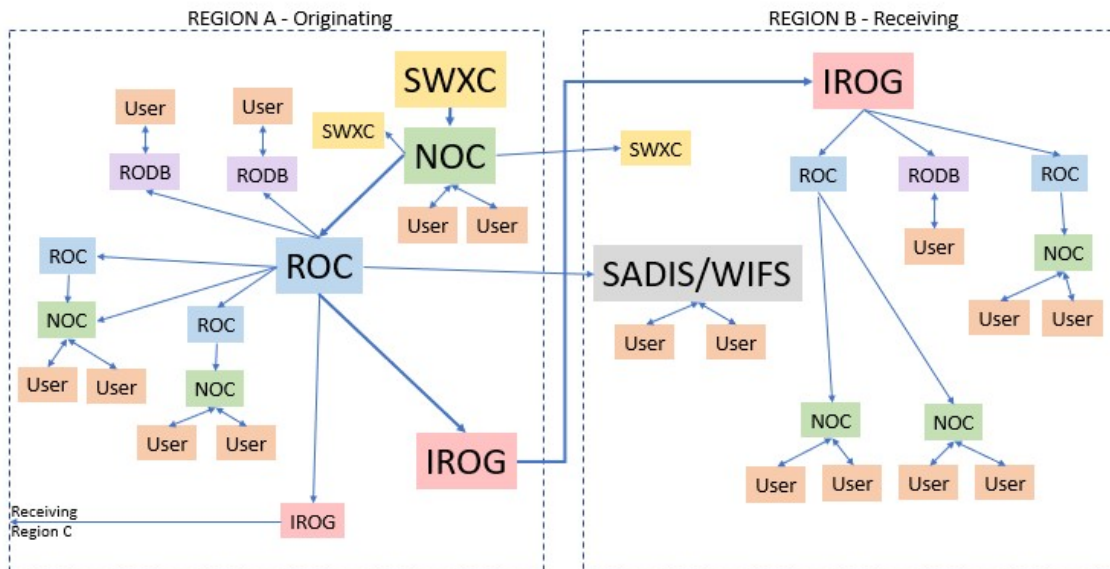
## 9.3 Data Access

### User

9.3.1 Users are responsible for arranging access to SWX Advisories through their associated NOC or SADIS/WIFS.

### Regional OPMET Date Bank (RODB)

9.3.2 RODBs should provide the capability for users to interrogate information, such as SWX Advisories, through the AFS.



## 10. AIREP/AIREP SPECIAL EXCHANGE

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

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

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

10.4 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, which are deemed not to warrant issuance of a SIGMET, shall be disseminated in the same way as SIGMET messages.

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

An example AIREP SPECIAL is given below:

```
FF EGRRVANW KWBCYMYX EGZZMASI RJTDYPYX RKSIYPYX VTBBYPYX
WSZZWWBX YBBBYPYX 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=
```

## 11. REGIONAL OPMET DATA BANKS (RODB)

11.1 The ASIA/PAC Regional OPMET Data Banks and the AFTN addresses<sup>1</sup> to be used for direct access to the data banks are shown below:

RODB	AFTN ADDRESS	ROCs IN THE AREA OF RESPONSIBILITY
Bangkok	VTBBZYX	Bangkok/VTBB Mumbai/VABB Colombo/VCCC Delhi/VIDP Karachi/OPKC Kolkata/VECC
Brisbane	YBBBZYX	Brisbane/YBBN Wellington/NZKL
Nadi	NFFNYZYX	Nadi/NFFN
Singapore	WSSSYZYX	Jakarta/WIII Kuala Lumpur/WMKK Singapore/WSSS

<sup>1</sup> Paragraph 11.1. shows the RODB AFTN addresses for the request and reply facility. The RODB AFTN addresses for collecting and disseminating METAR and TAF bulletins are shown in Appendix A and B, respectively.

RODB	AFTN ADDRESS	ROCs IN THE AREA OF RESPONSIBILITY
Tokyo	RJTDZYX	Beijing/ZBBB Hong Kong/VHHH Incheon/RKSI Tokyo/RJTD

## 11.2 Responsibilities

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

11.2.2 Handle all types of OPMET bulletins, as described in 3.1.1.

11.2.3 Provide facilities for “request-reply” service to the authorized users.

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

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

11.2.6 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.

11.2.7 The interrogation procedures applicable to the designated RODBs are provided in [Appendix H](#).

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

## 12. INTER-REGIONAL OPMET EXCHANGE

12.1 Inter-regional OPMET Gateways (IROGs) 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

12.2 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 ANP.

12.3 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 anticipated; and
- c) Be capable of handling all OPMET data types, as described in 3.1.1.

12.4 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.

12.5 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).

## 13. MANAGEMENT OF OPMET EXCHANGE

### 13.1. Changes to OPMET Bulletin Procedures

13.1.1 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.

13.1.2 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.

13.1.3 Notification via AFS should be done by means of a METNO message, which is to be issued by the originating ROC to all other ROCs and IROGs within the APAC Region. Each IROG should forward the METNO to their respective partner IROGs in neighboring regions. IROG Singapore and IROGs Tokyo/Nadi should also route the METNO to SADIS and WIFS respectively. The general rules of METNO procedure and the format of the METNO message are given in [Appendix E](#), along with the required timelines for METNO issuance.

13.1.4 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 three months.

## 13.2. Quality Management - OPMET Exchange

### 13.2.1 Objectives and Scope

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

13.2.1.2 **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 the preparation of messages.</i>
<i>OPMET Monitoring</i>	<i>Monitor and evaluate the performance indicators for the scheduled OPMET data.</i>

### 13.2.2 Quality Control – general requirements

13.2.2.1 **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.

13.2.2.2 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 the 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.

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

13.2.2.4 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.

13.2.2.5 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 purposes.

13.2.2.6 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.

### 13.2.3 Quality Control Procedures

13.2.3.1 General guidance on the quality control procedures for each type of OPMET is outlined in [Appendix F](#).

### 13.3. OPMET Monitoring

#### 13.3.1 Monitoring of Scheduled OPMET data

13.3.1.1 The monitoring shall focus on the measurement of two performance indicators (PIs) (Availability and Timeliness indices) of the scheduled, routine METAR and TAF OPMET data (TAC - SA and FT; IWXXM – LA and LT)) exchanged in the region. The PIs are described in detail in [Appendix F](#).

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

13.3.1.3 Methodology: Data is monitored with reference to the procedures defined in [Appendix F](#).

#### 13.3.2 Monitoring of Non-Scheduled OPMET data

13.3.2.1 Monitoring of non-routine OPMET data shall include:

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

13.3.2.2 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.

13.3.2.3 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.

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

#### 13.3.3 Reporting OPMET monitoring results

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

13.3.3.2 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.

13.3.3.3 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.

### 13.4. ROBEX Focal Points

13.4.1 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](#).

— END OF SECTION —

## 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 <i>Note: O/R indicates Bulletin available on request and NR indicates no report is available</i>
Col.5:	Dissemination of the bulletin to other ROCs and RODBs

- Notes:
- 1 Aerodromes not listed in Table AOP 1-1 indicated in italics*
  - 2 METAR included in VOLMET broadcasts are listed in APAC, ANP, VOL II, Table MET II-3, VOLMET Broadcasts*

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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	
<b>ASIA/PAC REGION</b>									
<b>Bangkok</b>	<b>VTBB</b>	<b>SAAE31</b>	VTBD	BANGKOK/Don Mueang Intl Airport	HH+00/30		BANGKOK	VTBBYPYX	
			VTBS	BANGKOK/Suvarnabhumi Intl Airport	HH+00/30		BRISBANE	YBBBYPYX	
			VTBU	RAYONG/U-Taphao Intl Airport	HH+00/30		NADI	NFFNYPYX	
			VTCC	CHIANG MAI/Chiang Mai Intl. Airport	HH+00/30		SINGAPORE	WSZZPYM	
			VTSP	PHUKET/Phuket Intl Airport	HH+00/30		TOKYO	RJTDYPYX	
			VTSS	SONGKHLA/Hat Yai Intl Airport	HH+00/30		Beijing	ZBBBYPYX	
		<b>SAAE32</b>	VDPV	PHNOM PENH	HH+00/30		BANGKOK	VTBBYPYX	
			VDSV	SIHANOUK	HH+00/30		BRISBANE	YBBBYPYX	
			VDSA	SIEM REAP/Siem Reap Angkor Intl	HH+00/30		NADI	NFFNYPYX	
			VLVT	VIENTIANE (Wattay)	HH+00/30		SINGAPORE	WSZZPYM	
			VYMD	MANDALAY INTERNATIONAL	HH+00/30		TOKYO	RJTDYPYX	
			VYNT	NAYPYITAW INTERNATIONAL	HH+00/30		Beijing	ZBBBYPYX	
		<b>SAAE33</b>	VLLB	LUANG PRABANG	HH+00		2300-1400	BANGKOK	VTBBYPYX
			VLLN	LUANG NAMTHA	HH+00		2300-1400	BRISBANE	YBBBYPYX
			VLPS	PAKSE	HH+00		2300-1400	NADI	NFFNYPYX
			VLSK	SAVANNAKHET	HH+00		2300-1400	SINGAPORE	WSZZPYM
		<b>SAAE34</b>	VVCI	CAT BI	HH+00/30			BANGKOK	VTBBYPYX
			VVCR	KHANH HOA/Cam Ranh	HH+00/30			NADI	NFFNYPYX
			VVCT	CAN THO	HH+00/30			BRISBANE	YBBBYPYX
			VVDN	DA NANG	HH+00/30			SINGAPORE	WSZZPYM
			VVNB	HA NOI/Noi bai	HH+00/30			TOKYO	RJTDYPYX
			VVPB	HUE/Phu Bai	HH+00/30			Beijing	ZBBBYPYX
			VVPQ	KIEN GIANG/Phu Quoc	HH+00/30			Colombo	VCCCPYX
			VVTS	HO CHI MINH/Tan Son Nhat	HH+00/30			Delhi	VIDPYPYX
VVVD	Van Don Int'l		HH+00/30	Hong Kong	VHZZYPYX				
<b>SATH31</b>	VTBO		TRAT/Khao Sming	HH+00	2200-1100	BANGKOK		VTBBYPYX	
	VTCH		MAE HONG SON	HH+00	2200-1100	BRISBANE		YBBBYPYX	
	VTCL		LAMPANG	HH+00	2300-1300	NADI		NFFNYPYX	
	VTGN	NAN	HH+00	2200-1300	SINGAPORE	WSZZPYM			
	VTCP	PHRAE	HH+00	2200-1100	TOKYO	RJTDYPYX			
	VTCT	CHIANG RAI/Chiang Rai Intl Airport	HH+00		Beijing	ZBBBYPYX			
VTPB	PHETCHABUN	HH+00	2200-1100						

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Name	CCCC	BUL No.	CCCC	Aerodrome			RODB/ROC	AFTN Address		
			VTPH	PRACHUAP KHIRI KHAN/Hua Hin	HH+00	2200-1100				
			VTPM	TAK/Mae Sot	HH+00	2200-1100				
			VTPO	SUKHOTHAI	HH+00	2200-1100				
			VTTP	PHITSANULOK	HH+00	2200-1500				
			VTPT	TAK	HH+00	2200-1100				
		SATH32	VTST	SURAT TANI	HH+00	2200-1500	BANGKOK	VTBBYPYX		
			VTSC	NARATHIWAT	HH+00	2200-1100	BRISBANE	YBBBYPYX		
			VTSE	CHUMPHON/Tab Gai	HH+00	2300-1100	NADI	NFFNYPYX		
			VTSF	NAKHON SI THAMMARAT	HH+00	2200-1500	SINGAPORE	WSZZYPYM		
			VTSG	KRABI	HH+00		TOKYO	RJTDYPYX		
			VTSM	SURAT THANI/Samui	HH+00	2200-1500	Beijing	ZBBBYPYX		
			VTSR	RANONG	HH+00	2200-1100				
			VTST	TRANG	HH+00	2200-1300				
			VTSY	BATONG	HH+00	0000-1000				
		SATH33	VTUD	UDON THANI	HH+00	2200-1500	BANGKOK	VTBBYPYX		
			VTUI	SAKON NAKHON/Ban Khai	HH+00	2200-1500	BRISBANE	YBBBYPYX		
			VTUK	KHON KAEN	HH+00		NADI	NFFNYPYX		
			VTUL	LOEI	HH+00	2200-1200	SINGAPORE	WSZZYPYM		
			VTUO	BURI RAM	HH+00	2200-1300	TOKYO	RJTDYPYX		
			VTUQ	NAKHON RATCHASIMA	HH+00	2200-1400	Beijing	ZBBBYPYX		
			VTUU	UBON RATCHATHANI	HH+00					
			VTUV	ROI ET	HH+00	2200-1400				
			VTUW	NAKHON PHANOM	HH+00	2200-1400				
		Beijing	ZBBB	SACI31	ZBAA	BEIJING/Capital	HH+00/30		BANGKOK	VTBBYPYX
					ZBAD	BEIJING/Daxing	HH+00/30		BRISBANE	YBBBYPYX
					ZBTJ	TIANJIN/Binhai	HH+00/30		NADI	NFFNYPYX
ZBYN	TAIYUAN/Wusu				HH+00/30	SINGAPORE	WSZZYPYM			
ZGGG	GUANGZHOU/Baiyun				HH+00/30	TOKYO	RJTDYPYX			
ZMCK	ULAANBAATAR/Chinggis Khaan				HH+00/30	Hong Kong	VHZZYPYX			
ZSHC	HANGZHOU/Xiaoshan				HH+00/30	Jakarta	WIZZMZBB			
ZSPD	SHANGHAI/Pudong				HH+00/30	Karachi	OPZZYPYX			
ZSSS	SHANGHAI/Hongqiao				HH+00/30	Mumbai	VABBYPYX			
ZWWW	URUMQI/Diwopu				HH+00/30	Incheon	RKSIYPYX			
ZYTL	DALIAN/Zhoushuizi				HH+00/30	Ulaanbaatar	ZMUBYMYX			
ZYTX	SHENYANG/Taoxian				HH+00/30					
SACI32	ZGKL				GUILIN/Liangjiang	HH+00	BANGKOK		VTBBYPYX	
	ZGNN				NANNING/Wuxu	HH+00	BRISBANE		YBBBYPYX	
	ZGOW			SHANTOU/Waisha	HH+00	NADI	NFFNYPYX			
	ZGSZ			SHENZHEN/Baoan	HH+00	SINGAPORE	WSZZYPYM			
	ZLXY			XI'AN/Xianyang	HH+00	TOKYO	RJTDYPYX			
	ZMUB			ULAANBAATAR / Buyant-Ukhaa	HH+00	Hong Kong	VHZZYPYX			
	ZPPP			KUNMING/Wujiaba	HH+00	Jakarta	WIZZMZBB			
	ZSAM			XIAMEN/Gaoqi	HH+00	Kuala Lumpur	WMZZYPYX			
	ZSFZ			FUZHOU/Changle	HH+00	Incheon	RKSIYPYX			
	ZSNB			NINGBO/Lishe	HH+00	Wellington	NZZZYPYX			
	ZSQD			QINGDAO/Liuting	HH+00					
	ZUUU			CHENGDU/Shuangliu	HH+00					
	ZUTF			CHENGDU/Tianfu	HH+00					
	ZBSJ			SHIJIAZHUANG/Zhengding	HH+00					
ZWSH	KASHI/Kashi			HH+00						
SACI41	ZBHH			HOHHOT/Baita	HH+00	BANGKOK	VTBBYPYX			
	ZGHA			CHANGSHA/Huanghua	HH+00	BRISBANE	YBBBYPYX			
	ZHCC			ZHENGZHOU/Xinzheng	HH+00	NADI	NFFNYPYX			
	ZHHH			WUHAN/Tianhe	HH+00	SINGAPORE	WSZZYPYM			
	ZJHK			HAIKOU/Meilan	HH+00	TOKYO	RJTDYPYX			
	ZJSY			SANYA/Phoenix	HH+00	Hong Kong	VHZZYPYX			

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ROC		METAR Bulletin			Bul. Time	Available	DISSEMINATION TO			
Name	CCCC	BUL No.	CCCC	Aerodrome			RODB/ROC	AFTN Address		
			ZLLL	LANZHOU/Zhongchuan	HH+00		Jakarta	WIZZMZBB		
			ZSNJ	NANJING/Lukou	HH+00		Karachi	OPZZYPYX		
			ZSOF	HEFEI/Luogang	HH+00		Mumbai	VABBYPYX		
			ZUCK	CHONGQING/Jiangbei	HH+00		Incheon	RKSIYPYX		
			ZYCC	CHANGCHUN/Longjia	HH+00		Ulaanbaatar	ZMUBMYX		
			ZYHB	HARBIN/Taiping	HH+00		Wellington	NZZZYPYX		
Brisbane	YBBN	SAAU31	YPAD	ADELAIDE/Adelaide Intl	HH+00/30		BANGKOK	VTBBYPYX		
			YBBN	BRISBANE/Brisbane Intl	HH+00/30		BRISBANE	YBBYPYX		
			YBCS	CAIRNS/Cairns Intl	HH+00/30		NADI	NFFNYPYX		
			YSCB	CANBERRA	HH+00/30		SINGAPORE	WSZZYPYX		
			YPDN	DARWIN/Darwin Intl	HH+00/30		TOKYO	RJTDYPYX		
			YBCG	GOLD COAST	HH+00/30		Beijing	ZBBYPYX		
			YMHB	HOBART	HH+00/30		Hong Kong	VHZZYPYX		
			YMML	MELBOURNE/Melbourne Intl	HH+00/30		Incheon	RKSIYPYS		
			YPPH	PERTH/Perth Intl	HH+00/30		Jakarta	WIZZYPYX		
		YSSY	SYDNEY/Sydney (Kingsford Smith) Intl	HH+00/30		Manila	RPLLYPYX			
								Mumbai	VABBYPYX	
								Wellington	NZZZYPYX	
				SAAU32	YBAS	ALICE SPRINGS	HH+00/30		BANGKOK	VTBBYPYX
					YMAV	AVALON	HH+00/30		BRISBANE	YBBYPYX
					YBWW	Brisbane West Wellcamp	HH+00/30		NADI	NFFNYPYX
					YBRM	BROOME/Broome Intl	HH+00/30		SINGAPORE	WSZZYPYX
					YBLN	Busselton	HH+00/30		TOKYO	RJTDYPYX
					YPXM	CHRISTMAS ISLAND	HH+00/30		Beijing	ZBBYPYX
					YPCC	COCOS (KEELING) ISLAND Intl	HH+00/30		Hong Kong	VHZZYPYX
					YCFB	COFFS HARBOUR	HH+00/30		Incheon	RKSIYPYS
					YPKG	KALGOORLIE-BOULDER	HH+00/30		Jakarta	WIZZYPYX
					YMLT	LAUNCESTON	HH+00/30		Manila	RPLLYPYX
					YPLM	LEARMONTH	HH+00/30		Mumbai	VABBYPYX
					YLHI	LORD HOWE ISLAND	HH+00/30		Wellington	NZZZYPYX
					YSNF	NORFOLK ISLAND Intl	HH+00/30			
					YPPD	PORT HEDLAND	HH+00/30			
				YBRK	ROCKHAMPTON	HH+00/30				
				YBSU	SUNSHINE COAST AIRPORT	HH+00/30				
				SAAU33	YGEL	GERALDTON	HH+00/30		BANGKOK	VTBBYPYX
					YGLA	GLADSTONE	HH+00/30		BRISBANE	YBBYPYX
					YHID	HORN ISLAND	HH+00/30		NADI	NFFNYPYX
					YPJT	PERTH/Jandakot	HH+00/30		SINGAPORE	WSZZYPYX
					YPWR	WOOMERA	HH+00/30		TOKYO	RJTDYPYX
					YSDU	DUBBO	HH+00/30		Beijing	ZBBYPYX
					YSRI	RICHMOND, NSW	HH+00/30		Hong Kong	VHZZYPYX
					YSTW	TAMWORTH	HH+00/30		Incheon	RKSIYPYS
								Jakarta	WIZZYPYX	
								Manila	RPLLYPYX	
								Mumbai	VABBYPYX	
								Wellington	NZZZYPYX	
				SAAU34	YBHM	HAMILTON ISLAND	HH+00/30		BANGKOK	VTBBYPYX
					YBMA	MOUNT ISA	HH+00/30		BRISBANE	YBBYPYX
									NADI	NFFNYPYX
									SINGAPORE	WSZZYPYX
								TOKYO	RJTDYPYX	
								Hong Kong	VHZZYPYX	
								Incheon	RKSIYPYS	
						Jakarta	WIZZYPYX			
						Wellington	NZZZYPYX			
		SAAU35	YCIN	CURTIN	HH+00/30		BANGKOK	VTBBYPYX		

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1		2			3	4	5			
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Name	CCCC	BUL No.	CCCC	Aerodrome			RODB/ROC	AFTN Address		
			YFRT	FORREST	HH+00/30		BRISBANE	YBBBYPYX		
			YPKU	KUNUNURRA	HH+00/30		NADI	NFFNYPYX		
			YPGV	GOVE	HH+00/30		SINGAPORE	WSZZYPYX		
		SAAU36			YAMB		AMBERLEY	HH+00/30	TOKYO	RJTDYPYX
					YPEA		PEARCE	HH+00/30	Hong Kong	VHZZYPYX
					YPTN		TINDAL	HH+00/30	Incheon	RKSIYPYS
					YBTL		TOWNSVILLE/Townsville Intl	HH+00/30	Jakarta	WIZZYPYX
					YWLM		WILLIAMTOWN	HH+00/30	Wellington	NZZZYPYX
		SATM31	WPDL	DILI/Presidente Nicolau Lobato Intl				HH+00/30	BANGKOK	VTBBYPYX
									BRISBANE	YBBBYPYX
									NADI	NFFNYPYX
						SINGAPORE	WSZZYPYX			
						TOKYO	RJTDYPYX			
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	BANGKOK	VTBBYPYX			
					HH+00	NR	BRISBANE	YBBBYPYX		
					HH+00	NR	NADI	NFFNYPYX		
					HH+00	NR	SINGAPORE	WSZZYPYM		
					HH+00	NR	TOKYO	RJTDYPYX		
					HH+00	NR	Beijing	ZBBBYPYX		
					HH+00	NR	Hong Kong	VHZZYPYX		
					HH+00		Jakarta	WIZZMIMI		
					HH+00		Wellington	NZZZYPYX		
Colombo	VCCC	SASB31	VCBI	BANDARANAIKE INTL AP COLOMBO	HH+10	BANGKOK	VTBBYPYX			
			VCRI	MATTALA RAJAPAKSA INTERNATIONAL AIRPORT	HH+10	BRISBANE	YBBBYPYX			
			VCCH	HINGURAKGODA/MINNERIYA	HH+10	NADI	NFFNYPYX			
		SAMV31	VRMG VRMH VRMM	GAN INTERNATIONAL AIRPORT HANIMAADHOO INTERNATIONAL AIRPORT MALE INTERNATIONAL AIRPORT			HH+10	SINGAPORE	WSZZYPYM	
							HH+10	TOKYO	RJTDYPYX	
							HH+10	Beijing	ZBBBYPYX	
Delhi	VIDP	SAIN32	VIDP	DELHI/Indira Gandhi Intl	HH+00/30	BANGKOK	VTBBYPYX			
			VILK	LUCKNOW	HH+00/30	BRISBANE	YBBBYPYX			
			VIAR	AMRITSAR	HH+00/30	NADI	NFFNYPYX			
			VEBN	VARANASI	HH+00/30	SINGAPORE	WSZZYPYM			
			VIJP	JAIPUR	HH+00/30	TOKYO	RJTDYPYX			

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1		2			3	4	5		
ROC		METAR Bulletin			Bul. Time	Available	DISSEMINATION TO		
Name	CCCC	BUL No.	CCCC	Aerodrome			RODB/ROC	AFTN Address	
			VIBN	VARANASI/Lal Bahadur Shastri	HH+00/30		Beijing Kolkata Hong Kong Karachi Mumbai	ZBBBYPYX VECCYPYX VHZZYPYX OPZZYPYX VABBYPYX	
Hong Kong	VHHH	SAHK31	VHHH	HONG KONG/Int	HH+00/30	2200-1200	BANGKOK	VTBBYPYX	
			RCTP	TAIBEI CITY/Taibei Intl	HH+00/30		BRISBANE	YBBBYPYX	
			RCKH	GAOXIONG	HH+00/30		NADI	NFFNYPYX	
			RCSS	TABEI/Songshan	HH+00/30		SINGAPORE	WSZZYPYM	
			RCMQ	TAICHUNG/Qingquangang	HH+00/30		TOKYO	RJTDYPYX	
			RCNN	TAINAN	HH+00/30		Beijing	ZBBBYPYX	
			RCFN	TAIDONG/Fengnian	HH+00/30		Kuala Lumpur	WMZZYPYR	
			VMMC	MACAO/Intl	HH+00/30		Incheon	RKSIYPYX	
			RPLL	MANILA/Ninoy Aquino Intl	HH+00		Wellington	NZZZYPYX	
			RPVM	LAPU-LAPU/Mactan-Cebu	HH+00				
			RPMD	DAVAO/Francisco Bangoy Intl	HH+00				
			RPLB	SUBIC BAY, Subic Bay Intl	HH+00				
			RPLI	LAOAG/Intl	HH+00		2100-1200, 1500, 1800		
			RPVZ	ZAMBOANGA/Intl	HH+00		2100-1200, 1500, 1800		
RPLC	PAMPANGA/Clark Intl	HH+00							
RPVP	PUERTO PRINCESA/Intl	HH+00	2100-1200, 1500, 1800						
Incheon	RKSI	SAKO31	RKSI	INCHEON	HH+00/30		BANGKOK	VTBBYPYX	
			RKSS	GIMPO	HH+00		BRISBANE	YBBBYPYX	
			RKPC	JEJU	HH+00		NADI	NFFNYPYX	
			RKPK	GIMHAE	HH+00		SINGAPORE	WSZZYPYM	
			RKTU	CHEONGJU	HH+00		TOKYO	RJTDYPYX	
			RKNY	YANGYANG	HH+00		Beijing	ZBBBYPYX	
			RKTN	DAEGU	HH+00		Hong Kong	VHZZYPYX	
			RKJB	MUAN	HH+00		Singapore	WSZZYPYM	
							Tokyo	RJTDYPYX	
							Wellington	NZZZYPYX	
			Mumbai	VABBYPYX					
Jakarta	WIII	SAID31	WAAA	MAKASSAR-/Sultan Hasanuddin	HH+00/30		BANGKOK	VTBBYPYX	
			WABB	BIAK/Frans Kaisiepo	HH+00/30		BRISBANE	YBBBYPYX	
			WIHH	JAKARTA/Halimperdana Kusuma	HH+00/30		NADI	NFFNYPYX	
			WIII	JAKARTA/Soekarno Hatta (COMM CENTER)	HH+00/30		SINGAPORE	WSZZYPYM	
			WIDD	BATAM/Hang Nadim	HH+00/30		TOKYO	RJTDYPYX	
			WIMM	MEDAN/Kualanamu	HH+00/30		Beijing	ZBBBYPYX	
			WADD	BALI/I Gusti Ngurah Rai	HH+00/30		Hong Kong	VHZZYPYX	
			WARR	SURABAYA/Juanda	HH+00/30		Kuala Lumpur	WMZZYPYR	
					Wellington	NZZZYPYX			
			SAID32	WAMM	MANADO/Sam Ratulangi	HH+00/30	0000-1200	BANGKOK	VTBBYPYX
		WIBB		PEKANBARU/Sultan Syarif Kasim II	HH+00/30	BRISBANE		YBBBYPYX	
		WIDN		TANJUNG PINANG/Raja Haji Fisabilillah Int'l	HH+00/30	NADI		NFFNYPYX	
		WIEE		PANDANG PARIAMAN/Minangkabau international	HH+00/30	SINGAPORE		WSZZYPYM	
		WIOO		PONTIANAK/Supadio	HH+00/30	TOKYO		RJTDYPYX	
		WIPP		PALEMBANG/Sultan Mahmud Badaruddin II	HH+00/30	Beijing		ZBBBYPYX	
		WAOO		BANJARMASIN/Syamsuddin Noor	HH+00/30	Hong Kong		VHZZYPYX	
		WALL		BALIKPAPAN/Sultan Aji Muhammad Sulaiman Sepinggan	HH+00/30	Kuala Lumpur		WMZZYPYR	
WADL	PRAYA/Zainuddin Abdul Madjid	HH+00/30		Wellington	NZZZYPYX				
WITT	BANDA ACEH/Sultan Iskandar Muda	HH+00/30							
WAHI	KULON PROGO/Internasional Yogyakarta	HH+00/30	2300-1500						

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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		
		SAID33	WAJJ	JAYAPURA/Sentani	HH+00/30	2300-1700	BANGKOK	VTBBYPYX		
			WAPP	AMBON/Pattimura	HH+00/30		BRISBANE	YBBBYPYX		
			WAHS	SEMARANG/Jenderal Ahmad Yani International	HH+00/30		NADI	NFFNYPYX		
			WILL	BANDAR LAMPUNG/Radin Inten II	HH+00/30		SINGAPORE	WSZZYPYM		
			WATT	KUPANG/EI Tari	HH+00/30	TOKYO	RJTDYPYX			
			WAQQ	TARAKAN/Juwata	HH+00/30	2200-1200	Beijing	ZBBBYPYX		
			WADY	BANYUWANGI/Banyuwangi	HH+00/30	2300-1100	Hong Kong	VHZZYPYX		
			WIMN	SIBORONGBORONG/Raja Sisingamangaraja XII	HH+00/30	0100-0800	Kuala Lumpur	WMZZYPYR		
						Wellington	NZZZYPYX			
Karachi	OPKC	SAPK31	OPKC	KARACHI/Jinnah Int'l	HH+00/30		BANGKOK	VTBBYPYX		
			OPIS	Islamabad International Airport	HH+00/30		BRISBANE	YBBBYPYX		
			OPLA	LAHORE/Allama Iqbal Int'l	HH+00/30		NADI	NFFNYPYX		
			OPNH	NAWABSHAH	HH+00/30		SINGAPORE	WSZZYPYM		
			OPGW	New Gwadar International Airport	HH+00/30		TOKYO	RJTDYPYX		
			OPPS	PESHAWAR	HH+00/30		Abu Dhabi	OMZZYPYX		
			OPSK	SUKKUR	HH+00/30		Bahrain	OBZZYPYX		
			OPMT	Multan	HH+00/30		Beijing	ZBBBYPYX		
			OPST	Sialkot	HH+00/30		Kolkata	VECCYPYX		
			OPFA	Faisalabad	HH+00/30		Delhi	VIDDYPYX		
						Hong Kong	VHZZYPYX			
						Mumbai	VABBYPYX			
						Tehran	OIZZYPYX			
Kolkata	VECC	SAIN33	VECC	NETAJI SUBHASH CHANDRA BOSE INTERNATIONAL AIRPORT, KOLKATA	HH+00/30		BANGKOK	VTBBYPYX		
			VEPT	PATNA	HH+00/30		BRISBANE	YBBBYPYX		
			VEGY	GAYA	HH+00/30		NADI	NFFNYPYX		
			VEGT	GUWAHATI	HH+00/30		SINGAPORE	WSZZYPYM		
		SABW31	VGEG	M.A. HANNAN INTL. CHITTAGONG	HH+00/30		TOKYO	RJTDYPYX		
			VGHS	HAZRAT SHAHJALAL INTERNATIONAL AIRPORT	HH+00/30		Beijing	ZBBBYPYX		
			VGSY	OSMANI INTERNATIONAL AIRPORT, SYLHET	HH+00/30		Colombo	VCCCPYX		
SAAS31	VNKT	KATHMANDU	HH+00/30	Delhi	VIDPYPYX					
	VQPR	PARO/Intl.	HH+00/30	Hong Kong	VHZZYPYX					
						Karachi	OPZZYPYX			
						Mumbai	VABBYPYX			
Kuala Lumpur	WMKK	SAMS31	WBGG	KUCHING/Intl	HH+00/30		BANGKOK	VTBBYPYX		
			WBKK	KOTA KINABALU/Intl	HH+00/30		BRISBANE	YBBBYPYX		
			WBSB	BRUNEI/Intl	HH+00/30		NADI	NFFNYPYX		
			WMKK	SEPANG/KL International Airport	HH+00/30		SINGAPORE	WSZZYPYM		
			WMKP	PENANG/Intl	HH+00/30		TOKYO	RJTDYPYX		
			WSSS	SINGAPORE/Changi	HH+00/30		Beijing	ZBBBYPYX		
			WSSL	SELETAR	HH+00/30		Colombo	VCCCPYX		
			WMSA	SUBANG/Sultan Abdul Aziz Shah	HH+00/30		Hong Kong	VHZZYPYX		
		WSAP	PAYA LEBAR (RSAF)	HH+00/30	Jakarta		WIZZMBMB			
									Manila	RPLLYPYX
									Mumbai	VABBYPYX
									Incheon	RKSIYPYX
									Wellington	NZZZYPYX
				SAMS38	WBGB		BINTULU	HH+00	BANGKOK	VTBBYPYX
					WBGR		MIRI	HH+00	BRISBANE	YBBBYPYX
					WBGS		SIBU	HH+00	NADI	NFFNYPYX
					WBKL		LABUAN	HH+00	SINGAPORE	WSZZYPYM
		WBKS	SANDAKAN		HH+00	TOKYO	RJTDYPYX			
		WBKW	TAWAU		HH+00	Beijing	ZBBBYPYX			
		WMKD	KUANTAN		HH+00	Colombo	VCCCPYX			

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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		
			WMKL WMKM WMKJ	PULAU LANGKAWI/Intl MALACCA JOHOR BAHRU/Sultan Ismail	HH+00 HH+00 HH+00		Hong Kong Jakarta Manila Mumbai Incheon Wellington	VHZZYPYX WIZZMBMB RPLLYPYX VABBYPYX RKSIYPYX NZZZYPYX		
Mumbai	VABB	SAIN31	VAAH	AHMEDABAD	HH+00/30		BANGKOK	VTBBYPYX		
			VABB	MUMBAI/Chhatrapati Shivaji Intl.	HH+00/30		BRISBANE	YBBBYPYX		
			VANP	NAGPUR	HH+00/30		NADI	NFFNYPYX		
			VOMM	CHENNAI	HH+00/30		SINGAPORE	WSZZYPYM		
			VOTR	TIRUCHCHIRAPPALLI	HH+00/30		TOKYO	RJTDYPYX		
			VOTV	TRIVANDRUM	HH+00/30		Abu Dhabi	OMZZYPYX		
			VOHS	HYDERABAD	HH+00/30		Bahrain	OBZZYPYX		
			VOBL	BANGALORE INTL APT	HH+00/30		Beijing	ZBBBYPYX		
			VOCL	CALICUT	HH+00/30		Colombo	VCCCPYX		
			VOCI	COCHIN INTERNATIONAL	HH+00/30		Delhi	VIDPYPYX		
			VOCB	COIMBATORE	HH+00/30		Hong Kong	VHZZYPYX		
VOML	MANGALORE	HH+00/30	Karachi	OPZZYPYX						
						Kolkata	VECCYPYX			
						Tehran	OIZZYPYX			
Nadi	NFFN	SAPS31	NCRG	RAROTONGA Intl.	HH+00		BANGKOK	VTBBYPYX		
			NFFN	NADI/Intl	HH+00		BRISBANE	YBBBYPYX		
			NFNA	NAUSORI/Intl	HH+00		NADI	NFFNYPYX		
			NFTF	FUA'AMOTU INTL.	HH+00		SINGAPORE	WSZZYPYM		
			NFTV	VAVA'U	HH+00		TOKYO	RJTDYPYX		
			NGFU	FUNAFUTI/Intl	HH+00		Wellington	NZZZYPYX		
			NGTA	TARAWA/Bonriki Intl	HH+00					
			NIUE	NIUE Intl	HH+00					
			NSFA	FALEOLO/Intl	HH+00					
			NVSS	SANTO/Pekoa	HH+00					
			NVVV	PORT VILA/Bauerfield	HH+00					
			PLCH	CHRISTMAS ISLAND	HH+00					
			NFTL	HA'APAI	HH+00					
				SAPS32	NLWW	WALLIS HIHIFO	HH+00			
			NWWW	NOUMEA LA TANTOUTA	HH+00					
		SAPS33	NTAA	TAHITI FAAA	HH+00					
Tokyo	RJTD	SAJP31	RJAA	NARITA Intl	HH+00		BANGKOK	VTBBYPYX		
			RJBB	KANSAI Intl	HH+00		BRISBANE	YBBBYPYX		
			RJCH	HAKODATE	HH+00		22:00-11:00	NADI	NFFNYPYX	
			RJGG	CHUBU CENTRAIR Intl	HH+00		SINGAPORE	WSZZYPYM		
			RJOO	OSAKA Intl	HH+00		20:00-11:00	TOKYO	RJTDYPYX	
			RJSS	SENDAI	HH+00		21:00-12:00	Beijing	ZBBBYPYX	
			RJTT	TOKYO Intl	HH+00			Guam	PGUMCOAX	
			ROAH	NAHA	HH+00			Hong Kong	VHZZYPYX	
								Incheon	RKSIYPYX	
						London	EGZZMASI			
						Wellington	NZZZYPYX			
				SAJP32	RJCC	SAPPORO/New Chitose	HH+00	BANGKOK	VTBBYPYX	
					RJFF	FUKUOKA	HH+00	BRISBANE	YBBBYPYX	
					RJFK	KAGOSHIMA	HH+00	21:00-12:00	NADI	NFFNYPYX
					RJFU	NAGASAKI	HH+00	22:00-12:00	SINGAPORE	WSZZYPYM
					RJOA	HIROSHIMA	HH+00	22:00-13:00	TOKYO	RJTDYPYX
					RJFT	KUMAMOTO	HH+00	22:00-12:00	Beijing	ZBBBYPYX
					RJSN	NIIGATA	HH+00	22:00-12:00	Guam	PGUMCOAX
					RJFO	OITA	HH+00	22:00-13:00	Hong Kong	VHZZYPYX
		RJOB	OKAYAMA		HH+00	22:00-12:00	Incheon	RKSIYPYX		

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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
			RJOT	TAKAMATSU	HH+00	22:00-12:00	London	EGZZMASI
			RJNK	KANAZAWA/Komatsu	HH+00		Wellington	NZZZYPYX
			RJNT	TOYAMA	HH+00	22:00-12:00		
		SAJP38	RJCK	KUSHIRO	HH+00	22:00-11:00	BANGKOK	VTBBYPYX
			RJCM	MEMANBETSU	HH+00	23:00-11:00	BRISBANE	YBBBYPYX
			RJCB	OBHIRO	HH+00	23:00-11:00	NADI	NFFNYPYX
			RJOC	IZUMO	HH+00	22:00-11:00	SINGAPORE	WSZZYPYM
			RJOH	MIHO	HH+00		TOKYO	RJTDYPYX
			RJOK	KOCHI	HH+00	22:00-11:00	Beijing	ZBBBYPYX
			RJFM	MIYAZAKI	HH+00	22:00-12:00	Brasilia	SBBRYZYX
			ROIG	NEW ISHIGAKI	HH+00	21:00-11:00	Hong Kong	VHZZYPYX
			RJNS	SHIZUOKA	HH+00	23:00-12:00	Incheon	RKSIYPYX
			RJSA	AOMORI	HH+00	22:00-12:00	London	EGZZMASI
			RJSF	FUKUSHIMA	HH+00	22:00-11:00	Rayong	VTBUYMYX
			RJOM	MATSUYAMA	HH+00	22:00-12:00		
			RJEC	ASAHIKAWA	HH+00	22:00-11:00		
			RJSK	AKITA	HH+00	22:00-12:00		
			RJAH	HYAKURI	HH+00			
			RJFR	KITAKYUSHU	HH+00			
			RJFS	SAGA	HH+00	22:00-14:00		
RJSI	HANAMAKI	HH+00	23:00-10:00					
Wellington	NZKL	SANZ31	NZWN	WELLINGTON Intl	HH+00/30		BANGKOK	VTBBYPYX
			NZAA	AUCKLAND Intl	HH+00/30		BRISBANE	YBBBYPYX
			NZCH	CHRISTCHURCH Intl			NADI	NFFNYPYX
		SANZ32	NZQN	QUEENSTOWN	HH+00/30		SINGAPORE	WSZZYPYM
					HH+00/30		TOKYO	RJTDYPYX
							Beijing	ZBBBYPYX
	Hong Kong	VHZZYPYX						
	Incheon	RKSIYPYX						
	Jakarta	WIZZYPYX						

— END OF SECTION —

**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 TAF filing time should be not earlier than 1 hour before the start of the period of validity.*
  - 2 *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.*
  - 3 *TAF included in VOLMET broadcasts are listed in APAC, ANP, VOL II, Table MET II-3, VOLMET Broadcasts.*
  - 4 *Aerodromes not listed in Table AOP I are indicated in italics.*

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Table B : Collection and Dissemination of TAF (FT) Bulletins											
1 ROC		2 TAF Bulletin						3 Dissemination			
Name	CCCC	BUL No.	CCCC	Aerodrome	Filing time	Start of validity	TAF validity	RODB/ROC	AFTN address		
ASIA/PAC REGION											
Bangkok	VTBB	FTAE31	VTBD	BANGKOK/Don Mueang Intl Airport	0535	0600	30	BANGKOK	VTBBYPYX		
			VTBS	BANGKOK/Suvarnabhumi Intl Airport	1135	1200	30	BRISBANE	YBBBYPYX		
			VTBU	RAYONG/U-Tapao Intl	1735	1800	24	NADI	NFFNYPYX		
			VTCC	CHIANG MAI/Chiang Mai Intl. Airport	2335	0000	30	SINGAPORE	WSZZYPYX		
			VTSP	PHUKET/Phuket Intl			30	TOKYO	RJTDYPYX		
			VTSS	SONGKHLA/Hat Yai Intl			24	Abu Dhabi	OMZZYPYX		
									Bahrain	OBZZYPYX	
									Beijing	ZBBBYPYX	
									Beirut	OLLLYPYX	
									Hong Kong	VHZZYPYX	
									Jeddah	OEJDYPYX	
									Karachi	OPZZYPYX	
									Kuala Lumpur	WMZZYPYR	
									Mumbai	VABBYPYX	
									Incheon	RKSIYPYX	
									Tehran	OIIIYPYX	
									Wellington	NZZZYPYX	
				FTAE32	VDP	PHNOM PENH	0535	0600	18 (24)	BANGKOK	VTBBYPYX
					VDSV	SIHANOUK	1135	1200	18 (24)	BRISBANE	YBBBYPYX
					VDSA	SIEM REAP/Siem Reap Angkor Intl	1735	1800	18 (24)	NADI	NFFNYPYX
		VGHS	HAZRAT SHAHJALAL INTL APT		2335	0000	30	SINGAPORE	WSZZYPYX		
		VLVT	VIENTIANE (Wattay)				24	TOKYO	RJTDYPYX		
		VYMD	MANDALAY INTERNATIONAL*				24	Bahrain	OBZZYPYX		
		VYNT	NAYPYITAW INTERNATIONAL				24	Beijing	ZBBBYPYX		
		VYYY	YANGON INTERNATIONAL				24	Beirut	OLLLYPYX		
								Hong Kong	VHZZYPYX		
								Jeddah	OEJDYPYX		
							Karachi	OPZZYPYX			
							Kuala Lumpur	WMZZYPYR			
							Mumbai	VABBYPYX			
							Incheon	RKSIYPYX			
							Tehran	OIIIYPYX			
							Wellington	NZZZYPYX			
		FTAE33	VLLB	LUANG PRABANG	0535	0600	24	BANGKOK	VTBBYPYX		
			VLLN	LUANG NAMTHA	1135	1200	24	BRISBANE	YBBBYPYX		
			VLPS	PAKSE	2335	0000	24	NADI	NFFNYPYX		
			VLSK	SAVANNAKHET			24	SINGAPORE	WSZZYPYX		
							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	NZZZYPYX			
		FTAE34	VVCI	CAT BI	0535	0600	24	BANGKOK	VTBBYPYX		
			VVCR	KHANH HOA/Cam Ranh Int'l	1135	1200	24	BRISBANE	YBBBYPYX		
			VVCT	CAN THO/Can Tho Int'l	1735	1800	24	NADI	NFFNYPYX		
			VVDN	DA NANG	2335	0000	24	SINGAPORE	WSZZYPYX		
			VVNB	HA NOI/Noi Bai			24	TOKYO	RJTDYPYX		
			VVPB	HUE/Phu Bai			24	Abu Dhabi	OMZZYPYX		

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Table B : Collection and Dissemination of TAF (FT) Bulletins									
1 ROC		2 TAF Bulletin						3 Dissemination	
Name	CCCC	BUL No.	CCCC	Aerodrome	Filing time	Start of validity	TAF validity	RODB/ROC	AFTN address
			VVPQ VVTS VVVD	KIEN GIANG/Phu Quoc Int'l HO CHI MINH/Tan Son Nhat Van Don Int'l			24 30 24	Bahrain Beijing Beirut Hong Kong Jeddah Karachi Kuala Lumpur Mumbai Incheon Tehran Wellington	OBZZYPYX ZBBBYPYX OLLLYPYX VHZZYPYX OEJDYPYX OPZZYPYX WMZZYPYR VABBYPYX RKSIIYPYX OIIIPYX NZZZYPYX
		<b>FTTH31</b>	VTBO VTCH VTCL VTCN VTCP VTCT VTPB VTPH VTPM VTPO VTPP VTPT	TRAT/Khao Sming MAE HONG SON LAMPANG NAN PHRAE CHIANG RAI/Chiang Rai Intl Airport PHETCHABUN PRACHUAP KHIRI KHAN/Hua Hin TAK/MAE SOT SUKHOTHAI PHITSANULOK TAK	0535 1135 1735 2335	0600 1200 1800 0000	24 24 24 24 30 24 24 24 24 24 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYX RJTDYPYX ZBBBYPYX
		<b>FTTH32</b>	VTSB VTSC VTSE VTSF VTSG VTSM VTSR VTST VTSY	SURAT THANI NARATHIWAT CHUMPHON/Tab Gai NAKHON SI THAMMARAT KRABI SURAT THANI/Samui RANONG TRANG BATONG	0535 1135 1735 2335	0600 1200 1800 0000	24 24 24 24 24 24 24 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYX RJTDYPYX ZBBBYPYX
		<b>FTTH33</b>	VTUD VTUI VTUK VTUL VTUO VTUQ VTUU VTUV VTUW	UDON THANI SAKON NAKHON/Ban Khai KHON KAEN LOEI BURI RAM NAKHON RATCHASIMA UBON RATCHATHANI ROI ET NAKHON PHANOM	0535 1135 1735 2335	0600 1200 1800 0000	24 24 24 24 24 24 24 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO Beijing	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYX RJTDYPYX ZBBBYPYX
<b>Beijing</b>	<b>ZBBB</b>	<b>FTCI31</b>	ZBAA ZBAD ZBTJ ZBYN ZGGG ZMCK ZSHC ZSPD ZSSS ZWWW ZYTL ZYTX	BEIJING/Capital BEIJING/Daxing TIANJIN/Binhai TAIYUAN/Wusu GUANGZHOU/Baiyun ULAANBAATAR/Chinggis Khaan HANGZHOU/Xiaoshan SHANGHAI/Pu Dong SHANGHAI/Hongqiao URUMQI/Diwopu DALIAN/Zhoushuizi SHENYANG/Taoxian	0535 1135 1735 2335	0600 1200 1800 0000	30 24 24 (30) 24 30 30 24 30 24 (30) 24 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO Hong Kong Karachi Mumbai Incheon Ulan Bator Wellington	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYX RJTDYPYX VHZZYPYX OPZZYPYX VABBYPYX RKSIIYPYX ZMUBMYX NZZZYPYX
		<b>FTCI32</b>	ZGKL ZGNN ZGOW ZGSZ ZLXY	GUILIN/Lianjiang NANNING/Wuxu SHANTOU/Waisha SHENZHEN/Baoan XI'AN/Xianyang	0535 1135 1735 2335	0600 1200 1800 0000	24 24 24 24 (30) 24	BANGKOK BRISBANE NADI SINGAPORE TOKYO	VTBBYPYX YBBBYPYX NFFNYPYX WSZZYPYX RJTDYPYX

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Table B : Collection and Dissemination of TAF (FT) Bulletins									
1 ROC		2 TAF Bulletin						3 Dissemination	
Name	CCCC	BUL No.	CCCC	Aerodrome	Filing time	Start of validity	TAF validity	RODB/ROC	AFTN address
			ZMUB	ULAANBAATAR/Buyant-Ukhaa			30	Hong Kong	VHZZYPYX
			ZPPP	KUNMING/Wujiaba			24 (30)	Jakarta	WIZZYPYX
			ZSAM	XIAMEN/Gaoqi			24	Karachi	OPZZYPYX
			ZSFZ	FUZHOU/Changle			24	Kuala Lumpur	WMZZYPYR
			ZSNB	NINGBO/Lishe			24	Mumbai	VABBPYX
			ZSQD	QINGDAO/Liuting			24	Wellington	NZZZYPYX
			ZUUU	CHENGDU/Shuangliu			24		
			ZUTF	CHENGDU/Tianfu			24		
			ZBSJ	SHIJIAZHUANG/Zhengding			24		
			ZWSH	KASHI/Kashi			24 (30)		
		<b>FTCI41</b>	ZBHH	HUHHOT/Baita	0535	0600	24	BANGKOK	VTBBYPYX
			ZGHA	CHANGSHA/Huanghua	1135	1200	24	BRISBANE	YBBBYPYX
			ZHCC	ZHENGZHOU/Xinzheng	1735	1800	24	NADI	NFFNYPYX
			ZHHH	WUHAN/Tianhe	2335	0000	24	SINGAPORE	WSZZYPYX
			ZJHK	HAIKOU/Meilan			24 (30)	TOKYO	RJTDYPYX
			ZJSY	SANYA/Phoenix			24	Hong Kong	VHZZYPYX
			ZLLL	LANZHOU/Zhongchuan			24	Jakarta	WIZZYPYX
			ZSNJ	NANJING/Lukou			24	Karachi	OPZZYPYX
			ZSOF	HEFEI/Luogang			24	Mumbai	VABBPYX
			ZUCK	CHONGQING/Jiangbei			24	Incheon	RKSIYPYX
			ZYCC	CHANGCHUN/Longjia			24	Ulan Bator	ZMUBYMYX
			ZYHB	HARBIN/Taiping			24	Wellington	NZZZYPYX
<b>Brisbane</b>	<b>YBBN</b>	<b>FTAU31</b>	YPAD	ADELAIDE/Adelaide Intl	0235	0300	30	BANGKOK	VTBBYPYX
			YBBN	BRISBANE/Brisbane Intl	0535	0600	30	BRISBANE	YBBBYPYX
			YBCS	CAIRNS/Cairns Intl	0835	0900	24	NADI	NFFNYPYX
			YSCB	CANBERRA	1135	1200	24	SINGAPORE	WSZZYPYX
			YPDN	DARWIN/Darwin Intl	1435	1500	30	TOKYO	RJTDYPYX
			YBCG	GOLD COAST	1735	1800	24	Beijing	ZBBBYPYX
			YMHB	HOBART	2035	2100	24	Hong Kong	VHZZYPYX
			YMLL	MELBOURNE/Melbourne Intl	2335	0000	30	Jakarta	WIZZYPYX
			YPPH	PERTH/Perth Intl			30	Manila	RPLLYPYX
			YSSY	SYDNEY/Sydney (Kingsford Smith) Intl			30	Mumbai	VABBPYX
								Wellington	NZZZYPYX
		<b>FTAU32</b>	YBAS	ALICE SPRINGS	0535	0600	24	BANGKOK	VTBBYPYX
			YMAV	AVALON	1135	1200	24	BRISBANE	YBBBYPYX
			YBWW	Brisbane West Wellcamp	1735	1800	24	NADI	NFFNYPYX
			YBRM	BROOME/Broome Intl	2335	0000	24	SINGAPORE	WSZZYPYX
			YBLN	Busselton			24	TOKYO	RJTDYPYX
			YPXM	CHRISTMAS ISLAND			24	Beijing	ZBBBYPYX
			YPCC	COCOS (KEELING) ISLAND Intl			24	Hong Kong	VHZZYPYX
			YCFS	COFFS HARBOUR			24	Jakarta	WIZZYPYX
			YPKG	KALGOORLIE-BOULDER			24	Manila	RPLLYPYX
			YMLT	LAUNCESTON			24	Mumbai	VABBPYX
			YPLM	LEARMONTH			24	Wellington	NZZZYPYX
			YLHI	LORD HOWE ISLAND			24		
			YSNF	NORFOLK ISLAND Intl			24		
			YPPD	PORT HEDLAND			24		
			YBRK	ROCKHAMPTON			24		
			YBSU	SUNSHINE COAST AIRPORT			24		
		<b>FTAU33</b>	YSDU	DUBBO	0535	0600	18	BANGKOK	VTBBYPYX
			YGEL	GERALDTON	1135	1200	18	BRISBANE	YBBBYPYX
			YGLA	GLADSTONE	1735	1800	18	NADI	NFFNYPYX
			YHID	HORN ISLAND	2335	0000	18	SINGAPORE	WSZZYPYX
			YPJT	PERTH/Jandakot			18	TOKYO	RJTDYPYX
			YSRI	RICHMOND, NSW			18	Beijing	ZBBBYPYX
			YSTW	TAMWORTH			18	Hong Kong	VHZZYPYX
			YPWR	WOOMERA			18	Jakarta	WIZZYPYX
								Manila	RPLLYPYX

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1 ROC		2 TAF Bulletin						3 Dissemination	
Name	CCCC	BUL No.	CCCC	Aerodrome	Filing time	Start of validity	TAF validity	RODB/ROC	AFTN address
								Mumbai Wellington	VABBYPYX NZZZYPYX
		FTAU34	YBHM	HAMILTON ISLAND	0500	0600	12	BANGKOK	VTBBYPYX
			YBMA	MOUNT ISA	1100 1700 2300	1200 1800 0000	12	BRISBANE NADI SINGAPORE TOKYO	YBBBYPYX NFFNYPYX WSZZYPYX RJTDYPYX
		FTAU35	YCIN	CURTIN	0100	0200	12	Beijing	ZBBBYPYX
			YFRT	FORREST	0700	0800	12	Hong Kong	VHZZYPYX
			YPGV	GOVE	1300	1400	12	Jakarta	WIZZYPYX
			YPKU	KUNUNURRA	1900	2000	12	Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU36	YAMB	AMBERLEY	0235 (M-F)	0300 (M-F)	24	BANGKOK	VTBBYPYX
			YPEA	PEARCE	0535	0600	18	BRISBANE	YBBBYPYX
			YPTN	TINDAL	1135	1200	24	NADI	NFFNYPYX
			YBTL	TOWNSVILLE/Townsville Intl	1735	1800	24	SINGAPORE	WSZZYPYX
			YWLM	WILLIAMTOWN	2035 (M-F) 2335	2100 (M-F) 0000	24	TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTTM31	WPDL	DILI/Presidente Nicolau Lobato Intl	0535	0600	12	BANGKOK	VTBBYPYX
						1135	1200	12	BRISBANE
					1735	1800	24	NADI	NFFNYPYX
					2335	0000	24	SINGAPORE	WSZZYPYX
								TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTNG31	AYPY	PORT MORESBY Intl	0535	0600	24	BANGKOK	VTBBYPYX
			AYWK	WEWAK	1135	1200	24	BRISBANE	YBBBYPYX
			AYVN	VANIMO	1735	1800	24	NADI	NFFNYPYX
			AYNZ	NADZAB	2335	0000	24	SINGAPORE	WSZZYPYX
			AYMH	MOUNT HAGEN			24	TOKYO	RJTDYPYX
			AYMO	MOMOTE			24	Beijing	ZBBBYPYX
			ANYN	NAURU I.			24	Hong Kong	VHZZYPYX
			AGGH	HONIARA (HENDERSON)			24	Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX

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Hong Kong	VHHH	FTHK31	VHHH	HONG KONG/International	0235	0300	30	BANGKOK	VTBBYPYX							
					0535	0600		BRISBANE	YBBBYPYX							
					0835	0900		NADI	NFFNYPYX							
					1135	1200		SINGAPORE	WSZZYPYX							
					1435	1500		TOKYO	RJTDYPYX							
					1735	1800		Beijing	ZBBBYPYX							
					2035	2100		Mumbai	VABBYPYX							
					2335	0000		Incheon	RKSIYPYX							
					FTHK32	VMC		MACAO/Intl	0535	0600	30	Wellington	NZZZYPYX			
									RCTP	TAIBEI CITY/Taibei Intl	1135	1200	30	London	EGZZMASI	
		RCKH	GAOXIONG	1735			1800		30	Washington	KWBCYMYX					
		RPLL	MANILA/Ninoy Aquino Intl	2335			0000		30							
		RPVM	LAPU-LAPU/Mactan, Cebu						30							
		RPLC	PAMPANGA/Clark Intl						30							
		FTHK33	RCSS	TAIBEI/Songshan			0535		0600			24				
							RCMQ		TAICHUNG/Qingquangang			1135	1200	24		
							RCNN		TAINAN			1735	1800	24		
							RCFN		TAIDONG/Fengnian			2335	0000	24		
					RPMD	DAVAO/Francisco Bangoy Intl			24							
					RPLB	SUBIC BAY/Intl			24							
RPLI	LAOAG/Intl						24									
RPMZ	ZAMBOANGA/Intl						24									
RPVP	PUERTO PRINCESA/Intl						24									
Incheon	RKSI				FTK031	RKSI	INCHEON Intl	0535	0600	30	BANGKOK	VTBBYPYX				
		RKSS	GIMPO Intl	1135				1200	30	BRISBANE	YBBBYPYX					
		RKPC	JEJU Intl	1735				1800	30	NADI	NFFNYPYX					
		RKPK	GIMHAE Intl	2335				0000	30	SINGAPORE	WSZZYPYX					
		RKTU	CHEONGJU Intl						30	TOKYO	RJTDYPYX					
		RKNY	YANGYANG Intl						30	Hong Kong	VHZZYPYX					
		RKTN	DAEGU INTL						30	Karachi	OPZZYPYX					
		RKJB	MUAN Intl						30	Wellington	NZZZYPYX					
		Jakarta	WIII	FTID32				WAMM	MANADO/Sam Ratulangi	0535	0600	24	BANGKOK	VTBBYPYX		
										WIBB	PEKANBARU/Sultan Syarif Kasim II	1135	1200	24	BRISBANE	YBBBYPYX
WIDN	TANJUNG PINANG/Raja Haji Fisabilillah Intl				1735	1800	24			NADI	NFFNYPYX					
WIEE	PADANG PARIAMAN/Minangkabau international				2335	0000	24			SINGAPORE	WSZZYPYM					
WIOO	PONTIANAK/Supadio						24			TOKYO	RJTDYPYX					
WIPP	PALEMBANG/Sultan Mahmud Badaruddin II						24			Beijing	ZBBBYPYX					
WAOO	BANJARMASIN/Syamsuddin Noor						24			Hong Kong	VHZZYPYX					
WALL	BALIKPAPAN/Sultan Aji Muhammad Sulaiman Sepinggian						24			Kuala Lumpur	WMZZYPYR					
WADL	PRAYA/Zainuddin Abdul Madjid						24			Wellington	NZZZYPYX					
WITT	BANDA ACEH/Sultan Iskandar Muda						24									
WAHI	KULON PROGO/Internasional Yogyakarta					24										
FTID33	WAJJ			JAYAPURA/Sentani	0535	0600	24									
					WAPP	AMBON/Pattimura	1135	1200	24							
					WAHS	SEMARANG/Jenderal Ahmad Yani International	1735	1800	24							
					WILL	BANDAR LAMPUNG/Radin Inten II	2335	0000	24							
					WATT	KUPANG/EI Tari			24							
					WAQQ	TARAKAN/Juwata			24							
					WADY	BANYUWANGI/Banyuwangi			24							
					WIMN	SIBORONGBORONG/Raja Sisingamangaraja XII			24							
					Karachi	OPKC	FTPK31	OPKC	KARACHI/Jinnah Intl	0535	0600	30	BANGKOK	VTBBYPYX		
		OPIS	Islamabad International Airport							1135	1200	30	BRISBANE	YBBBYPYX		
OPLA	LAHORE/Allama Iqbal Intl	1735	1800	30						NADI	NFFNYPYX					
OPNH	NAWABSHAH	2335	0000	30						SINGAPORE	WSZZYPYX					
OPPS	PESHAWAR			30						TOKYO	RJTDYPYX					

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			OPGW	New Gwadar International Airport			24	Abu Dhabi	OMZZYPYX		
			OPSK	SUKKAR			24	Bahrain	OBZZYPYX		
			OPMT	Multan			24	Beijing	ZBBBYPYX		
			OPST	Sialkot			24	Beirut	OLLLYPYX		
			OPFA	Faisalabad			24	Hong Kong	VHZZYPYX		
								Jeddah	OEJDYPYX		
								Karachi	OPZZYPYX		
								Tehran	OIIYPYX		
Mumbai	VABB	FTIN31	VAAH	AHMEDABAD	0535	0600	30	BANGKOK	VTBBYPYX		
			VABB	MUMBAI/Chhatrapati Shivaji Intl.	1135	1200	30	BRISBANE	YBBBYPYX		
			VANP	NAGPUR	1735	1800	30	NADI	NFFNYPYX		
			VOBL	BANGALORE INTL APT	2335	0000	30	SINGAPORE	WSZZYPYX		
			VOCB	COIMBATORE			30	TOKYO	RJTDYPYX		
			VOCI	COCHIN INTERNATIONAL AIRPORT			30	Abu Dhabi	OMZZYPYX		
			VOCL	CALICUT			30	Bahrain	OBZZYPYX		
			VOHS	HYDERABAD INTERNATIONAL AIRPORT			30	Beijing	ZBBBYPYX		
			VOML	MANGALORE			30	Beirut	OLLLYPYX		
			VOMM	CHENNAI			30	Hong Kong	VHZZYPYX		
			VOTR	TIRUCHCHIRAPPALLI			30	Jeddah	OEJDYPYX		
			VOTV	TRIVANDRUM			30	Karachi	OPZZYPYX		
				FTIN32	VIDP	DELHI/Indira Gandhi Intl	0535	0600	30	Tehran	OIIYPYX
					VEBN	VARANASI	1135	1200	30		
					VIAR	AMRITSAR	1735	1800	30		
					VJJP	JAIPUR	2335	0000	30		
					VILK	LUCKNOW			30		
					VIBN	VARANASI/Lal Bahadur Shastri			30		
				FTIN33	VECC	NETAJI SUBHASH CHANDRA BOSE INTERNATIONAL AIRPORT, KOLKATA	0535	0600	30		
					VEPT	PATNA	1135	1200	30		
					VEGY	GAYA	1735	1800	30		
					VEGT	GUWAHATI	2335	0000	30		
				FTSB31	VCBI	BANDARANAIKE INTL AP COLOMBO	0535	0600	30		
					VCRI	MATTALA RAJAPAKSA INTERNATIONAL AIRPORT	1135	1200	30		
		VCCH	HINGURAKGODA/MINNERIYA		1735	1800	30				
		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				
			VQPR	PARO/Intl.	1135	1200	30				
				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	NADI	NFFNYPYX		
			NFTV	VAVA'U	2335	0000	24	SINGAPORE	WSZZYPYX		
			NGFU	FUNAFUTI/Intl			24	TOKYO	RJTDYPYX		
			NGTA	TARAWA/Bonriki Intl			24	Hong Kong	VHZZYPYX		
			NIUE	NIUE Intl			24	Wellington	NZZZYPYX		
			NVSS	SANTO/Pekoa			24				

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			NVVV	PORT VILA/Bauerfield			24				
			PLCH	CHRISTMAS ISLAND			24				
			NFNA	NAUSOR/Intl			24				
			NSFA	FALEOLO/Intl			24				
		<b>FTPS32</b>	NLWW	WALLIS HIHIFO			24				
			NWWW	NOUMEA LA TANTOUTA			24				
		<b>FTPS33</b>	NTAA	TAHITI FAAA			24				
Singapore	WSSS	<b>FTSR31</b>	WSSS	SINGAPORE/Changi	0535	0600	30	BANGKOK	VTBBYPYX		
			WSAP	PAYA LEBAR (RSAF)	1135	1200	30	BRISBANE	YBBBYPYX		
			WSSL	SELETAR	1735	1800	30	NADI	NFFNYPYX		
			WAAA	MAKASSAR-/Sultan Hasanuddin	2335	0000	30	SINGAPORE	WSZZYPYX		
			WABB	BIAK/Frans Kaisiepo			30	TOKYO	RJTDYPYX		
			WADD	BALI/I Gusti 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/Kualanamu			24	Colombo	VCCCYPYX		
									Hong Kong	VHZZYPYX	
									Karachi	OPZZYPYX	
									Manila	RPLLYPYX	
									Mumbai	VABBYPYX	
									Incheon	RKSIYPYX	
									Tehran	OIIIYPYX	
									Wellington	NZZZYPYX	
				<b>FTSR32</b>	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	NADI	NFFNYPYX
					WMKM	MALACCA	2335	0000	24	SINGAPORE	WSZZYPYX
					WMKP	PENANG/Intl			24	TOKYO	RJTDYPYX
					WMSA	SUBANG/Sultan Abdul Aziz Shah			24 (30)	Beirut	OLLLYPYX
				<b>FTSR33</b>	WMKD	KUANTAN			24	Hong Kong	VHZZYPYX
					WBSB	BRUNEI/Intl	0535	0600	30	Manila	RPLLYMYX
					WBGB	<i>BINTULU</i>	1135	1200	24	Mumbai	VABBYPYX
					WBGG	KUCHING/Intl	1735	1800	24	Wellington	NZZZYPYX
					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	<b>FTJP31</b>	RJAA	NARITA Intl	0525	0600	30	BANGKOK	VTBBYPYX		
			RJBB	KANSAI Intl	1125	1200	30	BRISBANE	YBBBYPYX		
			RJCH	HAKODATE	1725	1800	30	NADI	NFFNYPYX		
			RJGG	CHUBU CENTRAIR Intl	2325	0000	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				

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								Incheon Washington Wellington	RKSIYPYX KWBCYMYX NZZZYPYX
		FTJP32	RJCC	SAPPORO/New Chitose	0525	0600	30	BANGKOK	VTBBYPYX
			RJFF	FUKUOKA/Fukuoka	1125	1200	30	BRISBANE	YBBBYPYX
			RJFK	KAGOSHIMA	1725	1800	30	NADI	NFFNYPYX
			RJFO	OITA	2325	0000	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 Karachi London Mumbai Noumea Saipan Washington Wellington	RKSIYPYX OPZZYPYX EGZZMASI VABBYPYX NWCCYMYX PGSNYMYX KWBCYMYX NZZZYPYX
			FTJP38	RJSA	AOMORI	0525	0600	30	BANGKOK
		RJSF		FUKUSHIMA	1125	1200	30	BRISBANE	YBBBYPYX
		RJSK		AKITA	1725	1800	30	NADI	NFFNYPYX
		RJOM		MATSUYAMA	2325	0000	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		NEW ISHIGAKI			30		
		RJFR		KITAKYUSHU			30		
		RJFS		SAGA			30		
		RJSI	HANAMAKI			30			
Wellington	NZKL	FTNZ31	NZAA	AUCKLAND Intl	0235	0300	30*	BANGKOK	VTBBYPYX
			NZCH	CHRISTCHURCH Intl	0535	0600	30*	BRISBANE	YBBBYPYX
			NZWN	WELLINGTON Intl	0835	0900	30*	NADI	NFFNYPYX
					1135	1200		SINGAPORE	WSZZYPYX
					1435	1500		TOKYO	RJTDYPYX
					1735	1800		Beijing	ZBBBYPYX
					2035	2100		Hong Kong	VHZZYPYX
				2335	0000				
				* For validities starting at 0300, 0900, 1500 and 2100, all TAFs will have a validity 3 hours shorter than indicated.					
		FTNZ32	NZQN	Queenstown	1130	1200	18		
					1730	1800			

— END OF SECTION —

## 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 an 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 for updating 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 periodically update 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 On 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 terms of message throughput (comparison of the percentage of messages received against messages relayed);
- (ii) Transit time of the relayed messages;
- (iii) Undertake the necessary follow-up of issues that arose from the exercise; and
- (iv) Verify and develop existing procedures.

— END OF SECTION —

## APPENDIX D — Use of WMO Abbreviated Heading

(For use in ROBEX Messages and Bulletins)

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

**T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii CCCC YYGGgg (BBB)**

2. Explanation of the symbols
  - 2.1. **T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii** – this group is used in accordance with *WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS, Attachment II-5*.

- 2.1.1. **T<sub>1</sub>T<sub>2</sub>** - 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	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	SWX Advisory	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 TAFs, which do not meet requirements but are nevertheless classified as FT for the WMO data type designator.*

- 2.1.2. **A<sub>1</sub>A<sub>2</sub>** - Geographical designator, composed of two letters, according to WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS, Attachment II-5, Table C1. The following principles shall apply:
  - a) For ROBEX bulletins containing OPMET data from a single State or territory, the A<sub>1</sub>A<sub>2</sub> designator should be chosen from Table C1, Part I – Country or territory designator;

- b) For ROBEX bulletins containing OPMET data from more than one State or territory, a suitable A<sub>1</sub>A<sub>2</sub> designator should be chosen from Table C1, Part II – Area Designators;
- c) For ROBEX bulletins containing SWX Advisories from the designated SWXCs, the A<sub>1</sub>A<sub>2</sub> designator XX is used (see also, paragraph 2.3.).

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 the 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.

2.1.3.3 For ROBEX bulletins containing SWX Advisories from the designated SWXCs, the ii designators used are based on each impact type as follows (see also, paragraph 2.3.):

- ii = 01 for GNSS;
- ii = 02 for HF COM;
- ii = 03 for Radiation; and
- ii = 04 for SATCOM.

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 (e.g., aeronautical meteorological station, aerodrome meteorological office or NOC).

2.3. For ROBEX bulletins containing SWX Advisories from the designated SWXCs, the **T<sub>1</sub>T<sub>2</sub>A<sub>1</sub>A<sub>2</sub>ii CCCC** designators used, based on SWX impact type [ii], SWXC originator location indicator [CCCC], and data type/message form [T<sub>1</sub>T<sub>2</sub>], are as follows:

SWXC	SWX impact	T <sub>1</sub> T <sub>2</sub> A <sub>1</sub> A <sub>2</sub> ii CCCC	
		TAC form	IWXXM form
ACFJ – Australia	GNSS	FNXX01 YMMC	LNXX01 YMMC
	HF COM	FNXX02 YMMC	LNXX02 YMMC
	RADIATION	FNXX03 YMMC	LNXX03 YMMC
	SATCOM	FNXX04 YMMC	LNXX04 YMMC
ACFJ – France	GNSS	FNXX01 LFPW	LNXX01 LFPW
	HF COM	FNXX02 LFPW	LNXX02 LFPW
	RADIATION	FNXX03 LFPW	LNXX03 LFPW
	SATCOM	FNXX04 LFPW	LNXX04 LFPW
CRC – China	GNSS	FNXX01 ZBBB	LNXX01 ZBBB
	HF COM	FNXX02 ZBBB	LNXX02 ZBBB
	RADIATION	FNXX03 ZBBB	LNXX03 ZBBB
	SATCOM	FNXX04 ZBBB	LNXX04 ZBBB
CRC – Russian Federation	GNSS	FNXX01 UUAG	LNXX01 UUAG
	HF COM	FNXX02 UUAG	LNXX02 UUAG
	RADIATION	FNXX03 UUAG	LNXX03 UUAG
	SATCOM	FNXX04 UUAG	LNXX04 UUAG

SWXC	SWX impact	T <sub>1</sub> T <sub>2</sub> A <sub>1</sub> A <sub>2</sub> ii CCCC	
		TAC form	IWXXM form
PECASUS – Finland	GNSS	FNXX01 EFKL	LNXX01 EFKL
	HF COM	FNXX02 EFKL	LNXX02 EFKL
	RADIATION	FNXX03 EFKL	LNXX03 EFKL
	SATCOM	FNXX04 EFKL	LNXX04 EFKL
PECASUS – United Kingdom	GNSS	FNXX01 EGRR	LNXX01 EGRR
	HF COM	FNXX02 EGRR	LNXX02 EGRR
	RADIATION	FNXX03 EGRR	LNXX03 EGRR
	SATCOM	FNXX04 EGRR	LNXX04 EGRR
United States	GNSS	FNXX01 KWNP	LNXX01 KWNP
	HF COM	FNXX02 KWNP	LNXX02 KWNP
	RADIATION	FNXX03 KWNP	LNXX03 KWNP
	SATCOM	FNXX04 KWNP	LNXX04 KWNP

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

2.4.1. YY – Day of the month.

2.4.2. 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.

2.5. **BBB** – Optional group indicating an amended, corrected or delayed bulletin.

2.5.1. 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 a 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.

2.5.2. 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 VOVI 170900Z 1712/1818 29005KT 4000 -RA/HZ SCT015 SCT020  
 FEW025CB BKN100 BECMG 1716/1717 3000 -RA/HZ TEMPO 1712/1721 1500  
 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1804/1805 30005KT  
 4000 HZ BECMG 1806/1807 27010KT 5000 -RA/HZ TEMPO 1809/1815  
 1500 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1816/1817 3000  
 HZ=  
 TAF VOCL 170900Z 1712/1818 33005KT 4000 -RA/HZ SCT015 SCT020  
 FEW025CB BKN100 BECMG 1716/1717 3000 -RA/HZ TEMPO 1712/1721 2000  
 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1804/1805 35005KT  
 5000 HZ BECMG 1806/1807 32010KT 5000 -RA/HZ TEMPO 1809/1815 2000  
 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1816/1817 3000 HZ=  
 TAF VOHS 170900Z 1712/1818 27010G20KT 6000 SCT020 SCT100 TEMPO  
 1712/1718 3000 -TSRA/RA SCT015 FEW025CB BKN080 TEMPO 1721/1803 3000  
 -TSRA/RA/HZ SCT015 FEW025CB BKN080 TEMPO 1809/1818 3000 -TSRA/RA  
 SCT015 FEW025CB BKN080=  
 TAF VOHY 170900Z NIL=  
 TAF VOMM 170900Z 1712/1818 17010KT 6000 SCT020 BKN100 TEMPO  
 1712/1718 SCT015 FEW025CB BKN100 BECMG 1720/1721 21010KT SCT020  
 BECMG 1803/1804 27010KT 8000 FEW020 SCT100 BECMG 1810/1811 13010KT  
 TEMPO 1812/1815 SCT015 FEW025CB BKN100 BECMG 1813/1814 6000=  
 TAF VOTR 170900Z 1712/1818 27010KT 6000 SCT020 SCT100 TEMPO  
 1712/1715 SCT015 FEW025CB BKN100 BECMG 1716/1717 33005KT FEW020  
 BECMG 1803/1804 27010G20KT 8000 FEW020 SCT250 BECMG 1812/1813  
 27005KT 6000 TEMPO 1812/1815 SCT015 FEW025CB BKN100=

**Second Part**

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

— END OF SECTION —

## **APPENDIX E — Procedure and Format of METNO bulletin for APAC ROBEX Bulletins**

### **1. METNO Procedure – General rules**

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

1.2. The METNO Focal Points verify the conformity of the change proposal against ICAO DOC 7910 (only registered Location Indicators can be accepted), ANP Volume II – MET tables, WMO No. 386 documents, and the syntax conforms to the METNO procedure. Implementation of IWXXM data: no IWXXM without TAC will be accepted (when a TAC form is described in Annex 3 / PANS-MET).

1.3. Modification requests for an upcoming AIRAC date have to be sent at least 28 days before the applicable AIRAC date. This will guarantee that all subsequent steps can be performed in time and allow full assessment by the METNO Focal Points, plus provide confirmation to the originator that all changes will be made at the required date.

1.4. The ROC will summarize all requests and present those via email to the METNO Focal Points at least 21 days before the applicable AIRAC date (Section 4 - METNO Process refers).

1.5. METNO Focal Points will review the requests and shall communicate any comments to the ROC at the latest 14 days after the preceding (14 days before the upcoming) AIRAC date. Nil comments shall be considered as a positive response.

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

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

1.8. In addition, ROBEX Focal Points (Appendix I to the ROBEX Handbook) will receive a confirmation by email. Motivated subscription to (or to unsubscribe from) the METNO Bulletins can be submitted via the METNO Focal Points.

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

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

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

1.12. For urgent modification, it can be decided with the explicit agreement of the METNO Focal Points to proceed more quickly by a deviation to the normal schedule. The ROC will compile a METNO for intermediate updates with immediate implementation of new or expiring bulletins.

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

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

## 2. Format and Content of the METNO-message

2.1. The METNO Syntax: The syntax of a METNO statement is presented in para. 2.4 below. It also includes the list of AFS addressees actually used as well as examples for the various OPMET data update METNO statements.

2.2. The METNO Header: The header of the METNO bulletin is NOA1A299 CCCC YYGGgg, where:

- A1A2 is a general area/country designator of the METNO issuing centre (i.e. ROC), as included in WMO No. 386 Manual on the Global Telecommunication System. According to [Table C1 of WMO No.386 \(Note 4\)](#), for the geographical designator in the abbreviated heading of the METNO messages, XX should be used.
- CCCC is the ICAO location indicator of the METNO issuing centre

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

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

### 2.3.1. ADDRPT

2.3.1.1. This statement is used when a new location indicator is added to an already METNO registered bulletin. It can be used for inserting METAR- or TAF-reports in an existing and registered bulletin.

2.3.1.2. Adding TAC-formatted METARs/TAFs to a registered bulletin does not automatically register the IWXXM equivalent data.

2.3.1.3. Adding IWXXM METARs/TAFs to a registered bulletin will no longer result in adding the equivalent TAC METARs/TAFs for their parallel distribution. The addition of TAC METARs/TAFs to a registered bulletin must be separately advised.

### 2.3.2. RMVRPT

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

2.3.2.2. Removing TAC-formatted METARs/TAFs from a registered bulletin will also remove the equivalent IWXXM data from the OPMET data register in case it has already been registered. There is no IWXXM data without equivalent TAC-formatted data (when a TAC form is described in Annex 3 / PANS-MET).

2.3.2.3. Removing IWXXM METARs/TAFs will no longer result in removing equivalent TAC METARs/TAFs from the OPMET data register.

### 2.3.3. NEWBUL



Delete Bulletin: <b>DELBUL TTAai CCCC</b> , or <b>DELBUL TTAai CCCC FIR/UIR</b> for Non-Routine bulletin where applicable	DELBUL FTSR34 WSSS
Add Report to existing Bulletin: <b>ADDRPT TTAai CCCC Locind(s)</b>	ADDRPT FTSR31 WSSS WAAA WABB WIMM ADDRPT FTSR32 WSSS WMKJ WMKK WMKL WMKM WMKP WMSA
Remove Report from existing Bulletin: <b>RMVRPT TTAai CCCC Locind(s)</b>	RMVRPT FTSR31 WSSS WMKK WMSA WMKP WMKJ RMVRPT FTSR32 WSSS WBSB WBKK WBGG WIMM
End of METNO	END

```
GG ZBBYPYX VCCYPYX VIDYPYX VHZZYPYX RKSIYPYX WIZZYPYX VECCYPYX
OPZZYPYX WMZZYPYR VABYPYX NZZYPYX VTBBYPYX YBBYPYX NFFNYPYX WSZZYPYX
RJTDYPYX
180200 WSSYPYX
NOXX99 WSSS 180200
METNO APAC OPMET 240321
NEWBUL FTSR33 WSSS WBSB WBGB WBGG WBGR WBSG
WBKK WBKL WBKS WBKW
DELBUL FTSR34 WSSS
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
```

### 3. METNO Focal Point – Prerequisites and Actions

3.1. The METNO Focal Points and team for management of the METNO process include the ICAO Regional Officer and ROBEX Focal Points from Australia, Hong Kong China, Japan and Singapore (Appendix I to the ROBEX Handbook).

3.2. The METNO Focal Points (METNO FPs) prerequisites are:

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

3.3. The METNO FPs receive update requests any time by email:

- Preferably via ROC, but also from NOCs
- After authentication, sort updates based on the suggested implementation date (AIRAC date)

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

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

3.6. Maintenance of regional METNOs and registered OPMET data.

3.7. Reports to APAC MET/IE WG.

**4. METNO Process**

<b>Lead time</b>	<b>Action</b>	<b>Subsequent activity/ additional notes</b>
<b>&gt;28 days</b>	NOCs wishing to make changes send planned changes to ROC	Via email
<b>28 days</b>	ROC collect changes in their area	usually by email/AFS
<b>21 days</b>	ROC sends collated changes to METNO FPs	METNO FPs reviews changes and shares with their regional group (usually RODBs & ROCs), usually by email/AFS
<b>7 days</b>	<p>ROCs provide the AFS routing (addressing) of newly METNO registered OPMET bulletins (TTAAii CCCC) to the:</p> <ol style="list-style-type: none"> <li>1) ROCs within its Area of Responsibility</li> <li>2) NOCs within its Area of Responsibility</li> </ol> <p>and when data is eligible for inter-regional distribution</p> <ol style="list-style-type: none"> <li>3) inter-regional IROGs within its Area of Responsibility.</li> </ol> <p>IROGs distribute the METNO to neighbouring IROGs and SADIS/WIFS as required.</p>	At this point the changes in the METNO are fixed as systems will start making changes in anticipation.
<b>Day 0</b>	<b>Operational changes go live</b>	<b>This must be on an AIRAC date</b>

— END OF SECTION —

**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 four 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 the 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 <b>UTC</b> VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =	SABM31 VYMD <b>100830</b> 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=	<b>FTID31 WIDD 112300</b> TAF WIDD 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=
TAF with invalid BBB:  FTBN31 OBBI 030525 <b>AMD</b> TAF AMD OBBI 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=	FTBN31 OBBI 030525 <b>AAA</b> 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 the 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 <b>030159</b> RRA OPKC <b>030200</b> 26004 8000 BKN020 27/23 Q1007 NOSIG=	SAPK31 OPKC <b>030200</b> RRA OPKC <b>030200</b> 26004 8000 BKN020 27/23 Q1007 NOSIG=
METAR with mistyped observation time:  SAID31 WADD <b>120100</b> METAR WADD <b>121000Z</b> 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=	SAXX31 WADD <b>120100</b> METAR WADD <b>120100Z</b> 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=
SPECI with incorrect Message Type, TT:  <b>SANZ31</b> NZKL 040000 <b>SPECI</b> NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG=	<b>SPNZ31</b> NZKL 040000 AAA <b>SPECI</b> 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 the forecast, including 'Z'.	
Validity Y <sub>1</sub> Y <sub>1</sub> G <sub>1</sub> G <sub>1</sub> /Y <sub>2</sub> Y <sub>2</sub> G <sub>2</sub> G <sub>2</sub>	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
<p>TAF with issue time error (wrong date):</p> <p>FCID31 WIII 181630 TAF WIII <b>041630Z</b> 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=</p>	<p>FCID31 WIII 181630 TAF WIII <b>181630Z</b> 0418/0503 00000KT 9000 FEW025 BECMG 0422/0424 16005KT=</p>
<p>TAF with mistyped Validity Period:</p> <p>FTPH31 RPLL 132200 TAF RPLC 132200Z <b>1400/1428</b> 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 –SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=</p>	<p>FTPH31 RPLL 132200 TAF RPLC 132200Z <b>1400/1424</b> 04006KT 9999 SCT036 BKN300 TEMPO 1400/1406 02010KT 5000 –SHRA FEW020 BKN270 TX32/1405Z TN22/1421Z=</p>
<p>TAF with Validity error (wrong date):</p> <p>FCMS33 WMKK 170748 TAF WMKK 170700Z <b>3009/3018</b> 30005KT 9999 FEW017CB SCT140 BKN270=</p>	<p>FCMS33 WMKK 170748 TAF WMKK 170700Z <b>1709/1718</b> 30005KT 9999 FEW017CB SCT140 BKN270=</p>
<p>TAF with 4-digit Validity period:</p> <p>FTXX31 WIDD 170121 TAF WIDD <b>0618</b> 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000=</p>	<p>FTXX31 WIDD 170121 TAF WIDD <b>1706/1718</b> 06010G20KT 9999 SCT018 BECMG 1712/1714 00000KT 7000=</p>

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"> <li>• Missing VALID string</li> <li>• Incorrect SIGMET number format</li> <li>• Incorrectly formatted validity period</li> </ul>	
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><b>SIGMET</b> 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><b>WSXX31</b> 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 <b>NO 01</b> VALID 210000/210600 RPLL TC OBS N0830 E12900 ....=</p>	<p>WCPH30 RPLL 210445 SIGMET <b>01</b> VALID 210000/210600 RPLL TC OBS N0830 E12900 ... =</p>
<p>SIGMET with incorrectly formatted validity period:</p> <p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID <b>18/1600 TO 18/2000</b> <b>UTC</b> VIDP- DELHI FIR EMBD TS ... =</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID <b>220500 TO 220900</b> OEJN- JEDDAH FIR ....=</p>	<p>WSIN90 VIDP 181800 VIDP SIGMET 06 VALID <b>181600/182000</b> VIDP- DELHI FIR EMBD TS ... =</p> <p>WSSD20 OEJD 220503 OEJD SIGMET 01 VALID <b>220500/220900</b> 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"> <li>• AHL</li> <li>• Code name</li> <li>• Observation date/time</li> </ul>	<p>Software verification</p> <p>Manual validate</p> <p>Periodic Quality Control &amp; PI Monitoring</p>
<p>TAF TAF AMD TAF COR  (FT,FC)</p>	<ul style="list-style-type: none"> <li>• AHL</li> <li>• Code name</li> <li>• Originating station ICAO location indicator</li> <li>• Date/time of issue</li> <li>• Date, time of starting, time of the end of the period the forecast refers to</li> </ul>	<p>Software verification</p> <p>Manual validate</p> <p>Periodic Quality Control &amp; PI Monitoring</p>
<p>SIGMET (WS, WC, WV)</p>	<ul style="list-style-type: none"> <li>• AHL</li> <li>• SIGMET Sequence No</li> <li>• Date/time groups indicating the period of validity</li> </ul> <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"> <li>Name of the FIR or the CTA the message is issued for</li> <li>Location indicator of the MWO originating the message</li> </ul>	
Volcanic Ash Advisory FV	<ul style="list-style-type: none"> <li>Type of message</li> <li>Issue date and time</li> </ul> <p>Additional Checks (recommended):</p> <ul style="list-style-type: none"> <li>Location indicator or name of the VAAC centre originating the message</li> </ul>	<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"> <li>Type of message</li> <li>Issue date and time</li> </ul> <p>Additional Checks (recommended):</p> <ul style="list-style-type: none"> <li>Location indicator or name of the TCAC centre originating the message</li> </ul>	<p>Software verification</p> <p>Manual validate</p> <p>Periodic TC Quality Control Monitoring</p>

## 2 OPMET Monitoring

### 2.1 Introduction Performance Index Calculation

2.1.1 A management system has been tasked to observe and monitor the OPMET distribution over the APAC AFS (AFTN/AMHS) network in terms of:

2.1.1.1 the coverage of the distribution and the consistency of the distribution;

2.1.1.2 availability and timeliness for APAC ANP Vol II Table MET II-2 required Routine OPMET data: METARs and TAFs;

2.1.1.3 APAC SIGMET availability and format as per requirements listed in the ANP Vol II Table MET II-1.

2.1.2 The Routine OPMET data Availability and Timeliness indices that have been defined by the MET/IE provide a measure of the performance of the OPMET data. Each index is produced individually for each scheduled OPMET data type: METAR and TAF.

2.1.2.1 The Routine OPMET data monitoring is typically performed each year, for the period of 30 days, during 1-30 November, unless agreed otherwise by a management system - provided that the monitoring results are compliant with the guidelines in this Handbook.

2.1.3 The inventory of SIGMETs issued by States in are listed in the Asia/Pacific Regional SIGMET Guide. The APAC SIGMET Availability index observes and monitors OPMET deficiencies in terms of:

2.1.3.1 WS, WC and WV-SIGMET production and distribution.

2.1.3.2 The SIGMET monitoring is performed by a management system.

- 2.1.4 A management system is tasked to report the OPMET Performance Indices yearly to the MET/IE and MET/SG for initiating remedial actions by States against deficiencies of:
  - 2.1.4.1 Availability and Timeliness of ANP Vol II Table MET II-2 listed required METAR and TAF of full operational aerodromes.
- 2.2 Performance Indices
  - 2.2.1 Definitions

**ANP** = The ICAO International electronic Air Navigation Plan.

**ANP Volume II Table MET II-2** = ICAO Doc 7754 including the Routine OPMET Data, METAR and TAF requirements for AOP aerodromes; full time or partial operational.

**ANP\_Av** = Aerodrome operability as reported in ANP Volume II Table MET II-2: "F" = Full time, "P" = Partially.

**AOP** = Aerodrome Operational Planning.

**AHL** = OPMET Bulletin Abbreviated Header Line (TTAAii CCCC YYGGgg BBB)

**YYGGgg** = The date-time group in the OPMET bulletin Abbreviated Header Line.

**RXTime** = Time of receipt (HH:MM:SS) of the bulletin (TTAAii CCCC BBB) containing the aerodrome METAR Observation of TAF Report

***ICAO APAC OPMET Performance Indices:***

– The ICAO APAC OPMET METAR and TAF Performance Indices: Availability and Timeliness, are calculated for ANP Vol II, Table MET II-2 fully available aerodromes (ref.: Table MET II-2, column 12 = “F”) and shall be reported per State. ANP partially available AOP aerodromes (based on Table MET II-2, column 12 = “P”) are not included in the statistics.

– The METAR and TAF Performance Indices are generated per ANP full-available aerodrome (Table MET II-2, column 12 = "F") day by day over a monitoring period of n days (n = 30). The average Performance Indices for the monitoring period are calculated for States from the daily results of its ANP full-available aerodromes.

– METAR Availability = for ANP required aerodromes where METAR is issued full-time every half hour, on average over a monitoring period of n days (n=30) 45.6 (=95%) of 48 observations should be available

For ANP-listed aerodromes where METAR is issued full-time every hour, on average over a monitoring period of n days (n=30) 22.8 (=95%) of 24 observations should be available at each aerodrome.

For a partial operational ANP aerodrome producing METAR, regardless of how frequently it is issued, at least 1 observation must be available each day. Partial

operational aerodromes are not considered for generating the overall average State METAR Availability.

NIL METARs and METAR bulletins where in the Abbreviated Header (TTAAii CCCC YYGGgg BBB) BBB = CC@ (COR) are ignored, thus excluded.

– METAR Timeliness = on average 95% ANP required and available METAR observation reports (not including SPECI; no NIL, no AMD observations; including COR observations) is received maximum 6 minutes / 10 minutes after the observation time (MM observation time(s) from the YYGGgg-Group in the bulletin Abbreviated Header = DDHHMM based on monitoring):  $RX\text{-Time} \leq HH:(MM + 6')$  and  $RX\text{-Time} \leq HH:(MM + 10')$ .

– TAF Availability = for ANP required aerodromes where 24- or 30-hour TAF is issued full-time (based on ANP VOL II, Table MET II-2, column 12), on average 3.8 (= 95%) TAF should be available each day.

For ANP-listed aerodromes where TAF is available partially, at least 1 TAF (COR) report not NIL, not AMD must be available each day. Partial operational aerodromes are not considered for generating the overall average State TAF Availability.

NIL TAF reports and TAF bulletins where in the Abbreviated Header (TTAAii CCCC YYGGgg BBB) BBB = AA@ (AMD) or BBB = CC@ (COR) are not included, thus ignored.

– TAF Timeliness = on average 95% ANP required and available TAF (excluding NIL and TAF reports with BBB = AMD; inclusive BBB = COR reports) is received within 60 minutes before the start period of validity of TAF (TAF validity period = GGGG based on monitoring):  $(GGGG - 60') \leq RX\text{-Time} \leq (GGGG + 0')$ .

**VPeriodx** = GGGG-TAF Validity Period (1 .. x) based on monitoring.

**Obsx** = MM-METAR Observation Time (1 .. x) based on the monitored DDHHMM YYGGgg-Group in the Abbreviated Header Line (AHL).

**REP\_EXP** = For an ANP aerodrome, the number of TAF reports and METAR observations expected according to the aerodrome operational hours indicated in the ANP Volume II Table MET II-2 column 12; "F" full or "P" partial.

**REP\_RX** = Per ANP aerodrome, the number of received TAF VPeriodx reports: not NIL and not counting amendments (BBB = A@@), and the number of received METAR Obsx observations: not NIL and not including amendments (BBB = A@@).

**FROM – TILL** = For ANP aerodromes, operational hours observed by monitoring TAF-reports (also NIL and including BBB = C@@ but no BBB = A@@) and METAR-observations (also NIL, no BBBRemark), reading the YYGGgg-Group of first till last received report/observation per day of the monitoring reference period.

## 2.2.2 Metrics for calculating the ICAO APAC OPMET Performance Indices

### 2.2.2.1 General

#### 2.2.2.1.1 A management system processing stages for generating the Routine OPMET Data Performance Indices are described next: Availability and Timelines Indices

- Thirty days AFTN/AMHS OPMET monitoring against the ANP Volume II Table MET II-2 OPMET Data Requirements.
- Step 1: Determination of METAR MM-Observation Times / TAF GGGG-Validity Periods per ANP aerodrome per day based on monitoring.
- Step 2: Per day, for every ANP aerodrome generation of the METAR, and FT-TAF ICAO OPMET Performance Indices.
- Step 3: Per day, per State generation of the METAR, and FT-TAF ICAO OPMET Performance Indices based on the monitored ANP aerodrome performance.
- Step 4: Calculation of the averages for the State's daily OPMET Performance Indices: FT/SA-Availability and -Timeliness, over the 30-day monitoring period.
- Step 5: Merge of FT-Indices to TAF-Indices per Station and per day. Generation of the final average State TAF Performance Indices per State for the (x = 30) days of the reference monitoring period = 01-30/11/YYYY.

#### 2.2.2.2 OPMET Data Monitoring

2.2.2.2.1 The multiple purpose APAC OPMET monitoring exercise is applied for the development of the metrics for calculating the ICAO APAC OPMET Performance Indices:

- Monitoring period: 01 – 30 November YYYY.
- Monitoring Centre: Designated AFTN/AMHS COM Centre or any other Centre

2.2.2.2.2 Special database scripts are being developed for analysing the resulting OPMET monitoring files for catalogue aerodromes, such as the ANP.

#### 2.2.2.3 ANP Aerodrome METAR Observation Times and TAF Validity Periods (Step1)

2.2.2.3.1 For the ANP aerodromes regular METAR Observation Times (Obsx) and FT TAF Validity Periods (VPeriodx) are being determined from the daily monitoring result files.

- METAR Observation Times: per day, per ANP aerodrome, if METAR required according to ANP.  
Observed MM-Observation times: Obs1 ... Obs16, from the YYGGgg-Group (where occurring) of received METARs (BBB = Blank). From the observed MM = Obsx, only the regular ones are retained for further processing:
  - o ANP aerodromes with ANP\_Av= "F": number of observed Obsx > 14 per day or Obsx not determined.
  - o ANP aerodromes with ANP\_Av = "P": number of observed Obsx > 7 per day or Obsx not determined.
  - o FROM\_TILL Operational hours: FROM = HHMM from first received, TILL = HHMM from last received aerodrome METAR Report-Date-Time per day.

- TAF Validity Periods: per day, per ANP aerodrome, if FT-TAF required according to ANP.

From the received FT-TAF Reports per ANP aerodrome (BBB != A@@@): the G1G1G2G2 VPeriod1 ... Vperiod15 of the TAF-report Validity Period Group. Only validated VPeriods are retained for further processing: valid VPeriodx = per monitored G1G1G2G2

- o The GG in the (FT)AAii CCCC YYGGgg Bulletin Header of the (FT)-report must be <= G1G1 in VPeriodx = G1G1G2G2.

- o FROM\_TILL Operational hours: FROM = HHMM from first received, TILL = HHMM from last received aerodrome (FT)-report Report-Date-Time per day.

– The number of (regular) METAR Observation Times (Obsx) and the number of (regular) FT TAF Validity Periods (VPeriodx) can vary day by day, depending on the aerodrome operations.

2.2.2.4 ANP Aerodrome OPMET Performance (Step 2)

2.2.2.4.1 Per ANP aerodrome, the ICAO METAR/TAF Availability and Timeliness are calculated per day of the referenced OPMET monitoring period.

2.2.2.4.2 Per monitoring day, only METAR observations and TAF reports from Bulletins with YY in YYGGgg from the Abbreviated Header Line (TTAAii CCCC YYGGgg) = that day are considered. Others are discarded for processing.

2.2.2.4.3 The aerodrome OPMET Performance (re-)considers the operational hours on a daily basis.

– ANP Aerodrome METAR Availability: Per monitoring day, only METAR observations from Bulletins with YY in YYGGgg from the Abbreviated Header Line (TTAAii CCCC YYGGgg) = that day are considered. Others are discarded for processing.

For every Obsx = MM the total number of received not NIL observations REP\_RX is determined, BBB != A@@, excluding duplications

REP\_EXP Depends on the ANP\_Av in the ANP: "F" or "P":

- o ANP\_Av = "F" => REP\_EXP = 48 for METARs issued every half hour; REP\_EXP = 24 where METAR issued once per hour.
- o ANP\_Av = "P" => REP\_EXP = 1.

The aerodrome METAR Availability for the monitoring day becomes:

- o  $(\text{REP\_RX} / \text{REP\_EXP}) * 100,00$  or 0,00 %. The maximum METAR Availability for an aerodrome = 100,00%.
- o If for an aerodrome, there are more Obsx than expected and the Availability Index exceeds 100,00%, it becomes rounded down to 100,00%.

– ANP Aerodrome METAR Timeliness: RXTIME and/or Obs

$\Delta t = \text{RXTIME (HH:MM:SS)} - \text{HHMM}$  in the observation Report-Date-Time Group.

**An aerodrome METAR received later than 10 minutes after the HHMM from the YYGGgg- Group (DDHHMM) is too late  $\Delta t > 10'$ : reports.**

Per monitoring day (=YY in YYGGgg of the AHL), for all Obsx of the aerodrome, the number of METAR observations for day = YY received on time, i.e. **RXTIME (HH:MM:SS) no later than 10 minutes after the observation time HHMM(00) in the AHL YYGGgg-Group ( $\Delta t \leq 10'$ ):**

- o The aerodrome timeliness on the monitored day becomes: Aerodrome METAR Timeliness =  $((\text{REP\_RX} - \text{reports}) / \text{REP\_RX}) * 100,00$  % and maximum 100,00% or 0,00%
- o Per METAR Obsx, the earliest received is considered for the timeliness. Obsx duplications received later are discarded.
- o If for an aerodrome, there are more Obsx than expected, even the exceeding observations are being evaluated for the Aerodrome METAR Timeliness.

– ANP Aerodrome (FT) TAF Availability: For each VPeriodx = GGGG the number of received not NIL (FT)-reports REP\_RX is determined, BBB != A@@@, excluding duplications.

REP\_EXP Depends on the TAF type TT = FT and the ANP\_Av in the ANP: "F" or "P":

- o For TAF TT = FT
  - ANP\_Av = "F" => REP\_EXP = 4
  - ANP\_Av = "P" => REP\_EXP = 1

The aerodrome (FT) Availability for the monitoring day becomes:

- o  $(\text{REP\_RX} / \text{REP\_EXP}) * 100,00$  or 0,00 %. The maximum (FT) Availability for an aerodrome = 100,00%.
- o Per aerodrome the most optimized series of VPeriodx determined in Step 1 is applied for the calculation of its Availability Index. For FT-TAFs, the VPeriodx in the row are to start every 6 hours, maximum  $24\text{hours}/6 = 4$  per day. In a series of VPeriods, each VPeriod has the same result for G1G1 modulo 6. Maximum two series of VPeriods are considered (FT TAF every 3 hours, 8 per day). Per aerodrome the series with all VPeriods for the same day of monitoring is retained for the calculation of the Availability Index (also for the Timeliness Index), or else the longest series having the most 6 hourly VPeriods. Other FT VPeriodx are ignored.

– ANP Aerodrome (FT) TAF Timeliness

Per monitoring day (=YY in YYGGgg of the AHL), only VPeriodx of the aerodrome from that day: Validity Period = YY@@/@@@@ or (YY+1)00/@@@@ are considered. Others are discarded for processing.

$\Delta t = \text{RXTime (HH:MM:SS)} - \text{start time of TAF Validity Period.}$

An Aerodrome TAF (FT) received more than 60 minutes before the Validity Period is too early ( $\Delta t < -60'$ ) ; received later than the start of the Validity Period is too late ( $\Delta t > \text{GGGG} + 0'$ ) = **reports**.

A TAF-report received between 60 minutes ( $- 60' \leq \Delta t \leq \text{GGGG}$ ) before, and till the start of its Validity Period is on time.

For all VPeriodx of the aerodrome, the number of reports received on time:

- o Aerodrome FT Timeliness =  $((\text{REP\_RX} - \text{reports}) / \text{REP\_RX}) * 100,00$  %
- o Per FT-TAF, the earliest received is considered for the Timeliness. VPeriodx duplications received later are discarded.
- o Per aerodrome the most optimized row of VPeriodx determined in Step 1 is applied for the calculation of its Timeliness Index. For FT-TAFs, the VPeriodx in the row are to start every 6 hours, maximum  $24\text{hours}/6 = 4$  per day and each having the same result for G1G1 modulo 6. The series with the most VPeriodx G1G1 starting on the day of monitoring or else the longest series is applied for the calculation of the aerodrome FT-Timeliness (idem dito FT-Availability) Index. Other FT VPeriodx are ignored.

#### 2.2.2.5 State OPMET Performance (Step 3)

2.2.2.5.1 After generating the ANP aerodrome ICAO OPMET Performance Indices, the Performance Indices are calculated per State as the average of its ANP aerodromes' Performance Indices per day for the number of days of the monitoring period.

- State METAR Availability: Per State, the average of METAR Availability of its ANP aerodromes is calculated day by day:

$$\frac{\text{SUM (\% Availability of ANP METAR required Aerodromes of the State)}}{\text{Number of ANP METAR required Aerodromes of the State}}$$

- State METAR Timeliness: Per State, the average of METAR Timeliness of its ANP Aerodromes, is calculated per day:

$$\frac{\text{SUM (\% Timeliness of ANP METAR required Aerodromes of the State)}}{\text{Number of ANP METAR required Aerodromes of the State}}$$

- State (FT) TAF Availability: Per State, the average of FT Availability of its ANP aerodromes is calculated per day:

$$\frac{\text{SUM(\% Availability of ANP FT required Aerodromes of the State)}}{\text{Number of ANP METAR required Aerodromes of the State}}$$

- State (FT) TAF Timeliness: Per State, the average of FT Timeliness of its ANP aerodromes is calculated day by day:

$$\frac{\text{SUM (\% Timeliness of ANP FT required Aerodromes of the State)}}{\text{Number of ANP METAR required Aerodromes of the State}}$$

#### 2.2.2.6 Average State FT/SA-Availability and –Timeliness (Step 4)

2.2.2.6.1 After generating the daily averages for the State's ICAO OPMET Performance Indices for all its ANP required locations, for each State the overall averages are calculated for the thirty-day monitoring period referred to.

#### 2.2.2.7 Average State TAF Performance Indices per State (Step 5)

2.2.2.7.1 Merge of FT-Indices to TAF-Indices per Station and per day. From the daily TAF (FT) Location Availability and Timeliness Indices, for each day the State Performance Indices are getting generated. Then, the State average TAF Availability and Timeliness Indices are produced for the referenced monitoring period.

$$\text{TAF} = \text{TT} = \text{FT}$$

#### 2.2.2.7.2 TAF Availability per State

Aerodrome = Aerodrome Full operational.

REP\_RX = FT TAF-Reports received per day not NIL; not counting BBB=A@@@.

REP\_EXP = TAF-Reports expected per day = 4 for TT = FT for Full operational aerodrome.

N = Number of aerodromes (Full operational) per State.

Day = monitoring day starting at 1 till 30.

Availability<sub>aerodrome</sub> = Aerodrome Availability per Day =  $\left(\frac{\#REP\_RX}{\#REP\_EXP}\right) * 100.00\%$ , minimum 0,00% and maximum 100,00%

Availability<sub>state</sub> = Average State Availability for number of monitoring days.

$$\text{Availability}_{\text{state}} = \frac{\sum_{\text{aerodrome}=1}^N (\sum_{\text{day}=1}^{30} ((\text{Availability}_{\text{aerodrome}})_{\text{day}}))}{N} \%$$

#### 2.2.2.7.3 TAF Timeliness per State

Aerodrome = Aerodrome Full operational.

REP\_RX = Received TAF-Reports per day, not NIL and not counting BBB=A@@.

reports = TAF-Reports per day received too early or too late: RXTime > 60' too early against the TAF Validity Period (@@G1 G1 G1 G1/@@ G2 G2 G2 G2) or TXTTime later than the start of the TAF Validity Period @@G1 G1 G1 G1.

$$\text{Timeliness}_{\text{aerodrome}} = \text{Aerodrome Timeliness per Day} = \left( \frac{\#REP\_RX - \text{reports}}{\#REP\_RX} \right) * 100.00\%$$

Timeliness<sub>state</sub> = Average State Timeliness for number of monitoring days.

$$\text{Timeliness}_{\text{state}} = \frac{\sum_{\text{aerodrome}=1}^N (\sum_{\text{day}=1}^{30} ((\text{Timeliness}_{\text{aerodrome}})_{\text{day}}))}{N} \%$$

#### 2.2.2.7.4 METAR Availability per State

Aerodrome = Aerodrome Full operational.

REP\_RX = Observations received per day not NIL; not counting BBB=C@@; not counting BBB=A@@.

REP\_EXP = Observation expected per day = 24 or 48 for Full operational aerodrome.

N = Number of aerodromes (Full operational) per State.

day = monitoring day starting at 1 till 30.

Availability<sub>aerodrome</sub> = Aerodrome Availability per Day =  $\left( \frac{\#REP\_RX}{\#REP\_EXP} \right) * 100.00\%$ , minimum 0,00% and maximum 100,00%

Availability<sub>state</sub> = Average State Availability for number of monitoring days.

$$\text{Availability}_{\text{state}} = \frac{\sum_{\text{aerodrome}=1}^N (\sum_{\text{day}=1}^{30} ((\text{Availability}_{\text{aerodrome}})_{\text{day}}))}{N} \%$$

#### 2.2.2.7.5 METAR Timeliness per State

Aerodrome = Aerodrome Full operational.

REP\_RX = Observations received per day not NIL; not counting BBB=C@@; not counting BBB=A@@.

REP\_EXP = Observation expected per day = 24 or 48 for Full operational aerodrome.

N = Number of aerodromes (Full operational) per State.

day = monitoring day starting at 1 till 30.

reports = Observations per day received too late: RXTime > 10' too late against the HHMM in the Report-Date-Time Group (DDHHMMZ).

$$\text{Timeliness}_{\text{aerodrome}} = \text{Aerodrome Timeliness per Day} = \left( \frac{\#REP\_RX - \text{reports}}{\#REP\_RX} \right) * 100.00\%$$

Timeliness<sub>state</sub> = Average State Timeliness for number of monitoring days.

$$\text{Timeliness}_{\text{state}} = \frac{\sum_{\text{aerodrome}=1}^N (\sum_{\text{day}=1}^{30} ((\text{Timeliness}_{\text{aerodrome}})_{\text{day}}))}{N \text{ Day}} \%$$

### 2.2.2.8 Average State TAF Performance Indices per State

2.2.2.8.1 Merge of FT-Indices to TAF-Indices per Station and per day. From the daily TAF (FT) Location Availability and Timeliness Indices, for each day the State Performance Indices are getting generated. Then, the State average TAF Availability and Timeliness Indices are produced for the referenced monitoring period.

— END OF SECTION —



## APPENDIX H — RODB OPMET Interrogation Procedures

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

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

### REQUEST/REPLY MESSAGE FORMAT

#### 1. Request messages

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

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

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

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

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

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

- 1.3.1 In the AFTN heading:

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

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

<b>RQM/</b>	indicates the start of a data request line
<b>TT</b>	WMO data type identifier ( <i>refer to 2.7</i> )
<b>CCCC</b>	4-letter location indicator (as per <i>ICAO Doc 7910 – Location Indicators</i> )
	<b>or</b>
<b>AAii</b>	bulletin identifier ( <i>WMO manual 386, table CI 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/TTCCCC<sub>1</sub>,CCCC<sub>2</sub>,.....,CCCC<sub>n</sub>=**

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

Examples:

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

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

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

**RQM/TT<sub>1</sub>CCCC,TT<sub>2</sub>,.....,TT<sub>n</sub>=**

Examples:

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

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

The format of the request line to obtain different meteorological data types for a

number of locations is as follows:

**RQM/TT<sub>1</sub>CCCC,CCCC,.../TT<sub>2</sub>CCCC,CCCC,.../...../TT<sub>n</sub>CCCC,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 an 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 to 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)

— END OF SECTION —

## 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: <a href="mailto:tim.hailes@bom.gov.au">tim.hailes@bom.gov.au</a> , <a href="mailto:sral@bom.gov.au">sral@bom.gov.au</a>
	Mr. Warren YOUNG ATM Information Specialist National Operations Management Centre Airservices Australia PO Box 1093 Tullamarine, VIC, 3043, Australia	e-mail: <a href="mailto:YBBBYPYX@airservicesaustralia.com">YBBBYPYX@airservicesaustralia.com</a> (primary) / <a href="mailto:warren.young@airservicesaustralia.com">warren.young@airservicesaustralia.com</a> (secondary)
CHINA	Ms. ZOU Juan Meteorologist Meteorology Division Air Traffic Management Bureau Civil Aviation Administration of China (CAAC) No.12 East San-huan Road Middle Chaoyang District Beijing 100022	Tel: +86 (10) 87786826 Fax: +86 (10) 87786820 e-mail: <a href="mailto:zoujuan@atmb.net.cn">zoujuan@atmb.net.cn</a>
HONG KONG CHINA	Mr. Patrick Lam 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 6200 Fax: +852 2910 1160 e-mail: <a href="mailto:hhlam@cad.gov.hk">hhlam@cad.gov.hk</a>
	Mr. B.L. Choy Hong Kong Observatory	Tel : +852 2926 8350 Fax : +852 2311 9448 e-mail : <a href="mailto:blchoy@hko.gov.hk">blchoy@hko.gov.hk</a>
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: <a href="mailto:williamr@afl.com.fj">williamr@afl.com.fj</a>

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
<b>INDIA</b>	Shri Gajendra Kumar Scientist-E India Meteorological Dept. New Delhi  <i>Administration units OPMET/ROBEX</i>  Director General of Meteorology India Meteorological Department Lodi Road, New Delhi – 110 003 India	Tel: +91 (11) 2462 5547 Fax: +91 (11) 24615371 e-mail: <a href="mailto:gkumarimd@gmail.com">gkumarimd@gmail.com</a> ; <a href="mailto:gajendra71.kumar@imd.gov.in">gajendra71.kumar@imd.gov.in</a>
<b>INDONESIA</b>	Mrs. Herlina Head of Sub Division for Dissemination of Aeronautical Meteorological Information Indonesian Agency for Meteorology Climatology and Geophysics Jalan Angkasa I No.2 Kemayoran, Jakarta, Indonesia - 10720  Mrs. Ni Ketut Feny P Staff of Sub Division for Dissemination of Aeronautical Meteorological Information 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: <a href="mailto:herlina@bmkgo.id">herlina@bmkgo.id</a> ; <a href="mailto:herlina_270963@yahoo.com">herlina_270963@yahoo.com</a>  Tel : +62 (21) 424 6321 Fax : +62 (21) 6546315 e-mail : <a href="mailto:fenypermatasari@bmkgo.id">fenypermatasari@bmkgo.id</a> ; <a href="mailto:fenypermatasari@gmail.com">fenypermatasari@gmail.com</a>
<b>JAPAN</b>	Mr. Kentaro Tsuboi Scientific Officer Information and Communications Technology Division Information Infrastructure Department Japan Meteorological Agency (JMA) 3-6-9 Toranomon, Minato City Tokyo 105-8431	Tel: +81 (3) 3434-9098 Fax: +81 (3) 3434-9097 e-mail: <a href="mailto:k-tsuboi@met.kishou.go.jp">k-tsuboi@met.kishou.go.jp</a>
<b>MALAYISIA</b>	Mr. Muhammad Nazri Noordin Principal Assistant Director of National Aviation Meteorological Centre Malaysian Meteorological Department	Tel: +60 (3) 8787 2161 Fax: +60 (3) 8787 1019 e-mail: <a href="mailto:mnazri@met.gov.my">mnazri@met.gov.my</a>

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
<p><b>MONGOLIA</b></p>	<p><i>Administration units OPMET/ROBEX</i></p> <p>Dr. Chai Mui Fatt Principal Assistant Director of Sabah Weather and Earthquake Operation Centre Sabah, Tingkat 7, Wisma Dang Bandang 8800 Kota Kinabalu Sabah</p> <p>Malaysian Meteorological Department Mr Banidsuren Byambaa Director of Aviation Meteorological center, National Agency for Meteorology and Environment Monitoring, Mongolia 17120 Buyant-Ukhaa, Khan-Uul district, Ulaanbaatar, Mongolia</p>	<p>Tel: +60 (88) 413340 Fax: +60 (88) 413696 e-mail: <a href="mailto:chai@met.gov.my">chai@met.gov.my</a></p> <p>Tel: +976 71285024 Fax: +976 70049869 e-mail: <a href="mailto:amc@namem.gov.mn">amc@namem.gov.mn</a></p>
	<p><b>NEW ZEALAND</b></p>	<p>Ms. Paula Acethorp Chief Meteorological Officer Civil Aviation Authority of New Zealand PO Box 3555 Wellington 6140 NEW ZEALAND</p>
<p><b>PAKISTAN</b></p>	<p>Mr Shamsuddin Hakro Additional Director Com Ops Communication Operations Branch Operations Directorate Terminal 1, HQ CAA JIAP Karchi</p> <p><i>Administration units OPMET/ROBEX</i></p> <p>Senior Joint Director Communication Operations Branch Operations Directorate Terminal 1, HQ CAA JIAP Karchi</p> <p>Mr. Akhlaq Ahmed Senior Meteorologist Meteorological Office Room No. 3106 JTC, Jinnah International Airport Karachi</p> <p><i>Administration units OPMET/ROBEX</i></p> <p>Main Meteorological Office Jinnah International Airport Karachi</p>	<p>Tel: +92 (21) 9907 2351 Fax: +92 (21) 9924 2187 e-mail: <a href="mailto:adld.comops@caapakistan.com.pk">adld.comops@caapakistan.com.pk</a></p> <p>Tel: +92 (21) 9907 1300 +92 (21) 9907 1302 Fax: +92 (21) 9924 8282 e-mail: <a href="mailto:pmdmmokarachi@gmail.com">pmdmmokarachi@gmail.com</a></p>

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
<b>PAPUA NEW GUINEA</b>	Mr. Tau Gabi National Weather Service Port Moresby PNG	Tel: Fax: e-mail: <a href="mailto:tgabi@png.met.gov.pg">tgabi@png.met.gov.pg</a>
<b>REPUBLIC OF KOREA</b>	<p>Mr. Kim Yeong-hun Assistant Director Aviation Meteorological Office of Korea Meteorological Administration (AMO/KMA) Planning and General Affairs Division 444 Je2terminal-daero, Jung-gu Incheon, 22382</p> <p>Mr. Lee Dong-Won Assistant Director Aviation Meteorological Office of Korea Meteorological Administration (AMO/KMA) Information and Technology Division 444 Je2terminal-daero, Jung-gu Incheon, 22832</p> <p><b>Administration units OPMET/ROBEX</b></p> <p>Aviation Meteorological Office of Korea Meteorological Administration (AMO/KMA) 444 Je2terminal-daero, Jung-gu Incheon, 22382 (Location Indicator : RKSIYPYX)</p>	<p>Tel: +82 (32) 222 3030 Fax: +82 (32) 740 2807 e-mail: <a href="mailto:av_pod@korea.kr">av_pod@korea.kr</a>; <a href="mailto:kyh13@korea.kr">kyh13@korea.kr</a></p> <p>Tel: +82 (32) 222 3030 Fax: +82 (32) 740 2807 e-mail: <a href="mailto:dwlee5@korea.kr">dwlee5@korea.kr</a></p>
<b>SINGAPORE</b>	<p>Mr. <b>Chiam</b> Keng Oon Senior Meteorologist, Meteorological Service Singapore, P.O. Box 8 Singapore Changi Airport Singapore 918141</p> <p>Mr. <b>Goh</b> Wee Poh Head, Customer Services Meteorological Service Singapore, P.O. Box 8, Singapore Changi Airport, Singapore 918141 SINGAPORE</p> <p><b>Administration units OPMET/ROBEX</b></p> <p>Central Forecast Office/Weather Services Division P.O. Box 8 Singapore Changi Airport Singapore 918141</p>	<p>Tel: +65 6244 6133 Fax: +65 6542 5026 e-mail: <a href="mailto:chiam_keng_oon@nea.gov.sg">chiam_keng_oon@nea.gov.sg</a></p> <p>Tel: +65 6542 9224 Fax: +65 6542 5026 Email: <a href="mailto:goh_wee_poh@nea.gov.sg">goh_wee_poh@nea.gov.sg</a></p>

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
<b>SRI LANKA</b>	Mr. E. S. Silva Meteorologist in charge Katunayake International Airport Colombo Sri Lanka	Tel: +94 11 2252721 Fax: +94 11 2252319 e-mail: <a href="mailto:meteo3@sltnet.lk">meteo3@sltnet.lk</a>
<b>THAILAND</b>	Mr. Bunpot Kujaphun Director, Aeronautical Information and Flight Data Management Centre Aeronautical Radio of Thailand Ltd., 102 Soi Ngamduplee, Tunkmahamek Sathorn, Bangkok 10120  Mr. Wanchalearm Petsuwan Computer Technical Officer Thai Meteorological Department 4353 Sukhumvit Road Bangna, Bangkok 10260	Tel: +66 (2) 2859083 Fax: +66 (2) 2878538 e-mail: <a href="mailto:bunpot.ku@aerothai.co.th">bunpot.ku@aerothai.co.th</a>  Tel: +66 (2) 399 4596 Fax: +66 (2) 744 6240 e-mail: <a href="mailto:wpetsuwan@hotmail.com">wpetsuwan@hotmail.com</a>
<b>USA</b>	Mr. Michael Graf National Weather Service  Karen Shelton-Mur Federal Aviation Administration	Tel: +1 (301) 427 9109 Fax: +1 (301) 713 1520 e-mail: <a href="mailto:michael.graf@noaa.gov">michael.graf@noaa.gov</a>  Tel: +1 (202) 267 7985 e-mail: <a href="mailto:Karen.shelton-mur@faa.gov">Karen.shelton-mur@faa.gov</a>

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