INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE TWENTY-FIRST MEETING OF THE METEOROLOGICAL INFORMATION EXCHANGE WORKING GROUP (MET/IE WG/21)

(Bangkok, Thailand, 27 – 29 March 2023)

The views expressed in this Report are those of the Meeting and not the Organization.

Approved by the Meeting and published by the ICAO Asia and Pacific Office, Bangkok

Correction to HISTORY OF THE MEETING, 5.2., and REPORT ON AGENDA ITEMS – MET/IE WG/21, 5.15.

There was an error in the Draft Conclusion MET/IE WG/21-04: PROVISION OF QUALITY METEOROLOGICAL INFORMATION. The section commencing with "Why:" should have read, "Most States are now producing meteorological information in IWXXM. However, users will only transition from TAC to IWXXM forms when they can reliably access quality IWXXM information from all the required States."

Table of Contents

List of Appendices

HISTORY OF THE MEETING

1. Dates and venue

1.1. The ICAO Asia and Pacific (APAC) Regional Office hosted the Twenty-first Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/21) in Bangkok, Thailand, from 27 to 29 March 2023.

1.2. The Meeting included a conjoint session with the Thirteenth Meeting of the Meteorological Services Working Group (MET/S WG/13) on 29 March 2023 to jointly discuss agenda items relevant to the MET/IE and MET/S WG.

2. Attendance

2.1. Fifty-six (56) participants attended the Meeting from sixteen (16) States/Special Administrative Regions, including Australia, Bhutan, Brunei Darussalam, Cambodia, Hong Kong China, Fiji, India, Indonesia, Japan, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Thailand, Viet Nam, and ICAO. The list of participants is in **Appendix D** of this Report.

3. Officers and Secretariat

3.1. Mr Tim Hailes, National Manager, Transport Customer Engagement, Bureau of Meteorology, Australia, presided as Chair of the Meeting. Following the election of a Vice Chairperson under agenda item 1, the Chair was assisted by Mr Marco Mang-Hin Kok, Acting Senior Scientific Officer, Hong Kong Observatory, in the role of Vice Chair of the Meeting.

3.2. Ms Paula Acethorp, Chief Meteorological Officer, Civil Aviation Authority of New Zealand, presided as Meeting Chair for the conjoint Meeting session, assisted by Mr Tim Hailes and Mr Marco Mang-Hin Kok.

3.3. Mr Peter Dunda, Regional Officer Aeronautical Meteorology and Environment, ICAO APAC Office, acted as Secretary for the Meeting.

4. Language and Documentation

4.1. The working language of the Meeting was English, inclusive of all documentation and this Report. The Meeting considered eighteen (18) Working Papers (WPs), nine (9) Information Papers (IPs) and one (1) Flimsy in the first two days of the Meeting and an additional three (3) WPs in the conjoint session between MET/IE WG/21 and MET/S WG/13 on the third day. The list of papers is in **Appendix E** of this Report.

5. Outcomes

5.1. The Meeting recorded outcomes in the form of Draft Conclusions, Draft Decisions or Decisions within the following definitions:

a) Draft Conclusions: formulated by the MET/IE WG for further consideration by the Meteorology Sub-group (MET SG), deal with matters of a technical nature and of regional applicability that, according to the MET SG's terms of reference, require the attention of States, or action by the ICAO, following established APANPIRG procedures;

b) Draft Decisions: formulated by the MET/IE WG for further consideration by the MET SG, relate solely to matters dealing with the internal working arrangements of APANPIRG and its contributory bodies; and

c) Decisions: adopted by the MET/IE WG, relate solely to matters dealing with the internal working arrangements of the MET/IE WG.

5.2. The Meeting formulated the following three (3) Draft Conclusions and one (1) Decision:

Draft Conclusions

Draft Conclusion MET/IE WG/21-01: IWXXM VERSION COMPATIBILITY	
What: That, States are requested to ensure that MET service providers, air navigation service providers (ANSPs), airlines and other end users do the following: a) make the necessary system upgrades to support the IWXXM version which complies with the latest amendment to Annex 3 as stated in the IWXXM compatibility table*; and b) prepare for future system upgrades to support future IWXXM versions driven by further amendments to Annex 3. (*Link to the IWXXM capability table: https://github.com/wmo-im/iwxxm/wiki/Package-Compatibility)	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Most States are generating and exchanging IWXXM OPMET data in version 3.0. With the evolution of ICAO Annex 3, IWXXM version 3.0, which complied with Amendments 78 to Annex 3, is no longer compliant with Amendments 80 to ICAO Annex 3. To avoid the potential impact to operations due to IWXXM version compatibility issues of the systems, States are required to upgrade the systems for generating, exchanging and consuming IWXXM reports to support the IWXXM version which complies with the latest amendment to Annex 3.	Follow-up: ☒Required from States
When: 29-Mar-23	Status: Draft to be adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Draft Conclusion MET/IE WG/21-03: GLOBAL EXCHANGE OF IWXXM	
What: That, ACSICG prioritise the implementation of intra- and inter-region network circuits, including support for the Air Traffic Services Message Handling System (AMHS) with File Transfer Body Part (FTBP) and Interpersonal Message Heading Extension (IHE), to support the global exchange of messages in the ICAO Meteorological Information Exchange Model (IWXXM) form.	Expected impact: ☐ Political / Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: Aviation users require access to global OPMET information provided in IWXXM form. Without suitable communication network connections, global exchange will not be possible, preventing users from safely migrating from text to new IWXXM services.	Follow-up: ☐Required from States
When: 29-Mar-23	Status: Draft to be adopted by Subgroup
Who: ☐Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Draft Conclusion MET/IE WG/21-04: PROVISION OF QUALITY METEOROLOGICAL

INFORMATION	
What: That, States are reminded that the provision of specified meteorological information in IWXXM form has been an ICAO Annex 3 standard requirement since 2020. Where a State provides, or arranges the provision of, IWXXM information through translation services (from traditional alphanumeric code (TAC)-formatted information), the TAC-formatted information must be ICAO compliant otherwise translation errors occur, resulting in higher costs for users and preventing the benefits of IWXXM being obtained.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: Most States are now producing meteorological information in IWXXM. However, users will only transition from TAC to IWXXM forms when they can reliably access quality IWXXM information from all the required States.	Follow-up: ☒Required from States
When: 29-Mar-23	Status: Draft to be adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:	

Draft Decisions

[Nil]

Decisions

Decision MET/IE WG/21-02: UPDATES TO IWXXM FAQs	
What: That, the MET/IE WG endorses the updates to the IWXXM FAQs document in WP/07 for sharing with States and the publishing of the updated version of IWXXM FAQs to the APAC eDocument website.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The IWXXM FAQs document has proven a useful guide to assist States with their implementation of IWXXM. The inclusion of recent learnings from States will add further value to this IWXXM FAQs document.	Follow-up: ☐Required from States
When: 29-Mar-23	Status: Adopted by Subgroup
Who: ☐Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

Action Items

5.3. In addition, the Meeting recorded seventeen (17) new action items (by MET/IE WG/21), including one (1) during the conjoint session, as indicated throughout the Report on Agenda Items below and presented in the List of Actions in **Appendix A** of this Report.

– – – – – – – – – – – – – –

REPORT ON AGENDA ITEMS – MET/IE WG/21

1. Organizational matters

WP/01 – PROVISIONAL AGENDA (Secretariat)

1.1. The Meeting adopted the agenda as listed below:

MET/IE WG/21 (27 – 29 March 2023)
Agenda Item 1: Organisational matters (including the election of a Vice Chairperson)
Agenda Item 2: Review of follow-up from previous meetings
Agenda Item 3: Meteorological information exchange schemes
Agenda Item 4: Meteorological information exchange in digital form
Agenda Item 5: Quality control, monitoring and management of meteorological information exchange
Agenda Item 6: Guidance material related to meteorological information exchange
Agenda Item 7: Future work program and terms of reference
Agenda Item 8: Any other business
Agenda Item 9: Next Meeting

Conjoint session of MET/IE WG/21 and MET/S WG/13 (29 March 2023)
Agenda Item 1: Volcanic ash advisory centre (VAAC) backup tests
Agenda Item 2: SIGMET tests

Retirement from the MET/IE WG (Chair)

1.2. The Meeting congratulated Ms Sujin Promduang (not present at the Meeting) on her retirement from service and years of MET/IE WG membership, including as a former chairperson. The Meeting appreciated Ms Promduang's contributions to the working group and her significant leadership in Thailand and the Asia Pacific Region aviation.

Election of a Vice Chairperson (Chair and Secretariat)

1.3. As requested by the Chairperson, this agenda item included the election of a Vice Chairperson for the MET/IE WG. Accordingly, the Meeting elected Mr Marco Mang-Hin Kok, Acting Senior Scientific Officer, Hong Kong Observatory, as the Vice Chair of the MET/IE WG. The Meeting congratulated Mr Marco Mang-Hin Kok and expressed appreciation for accepting the role.

2. Review of follow-up from previous meetings

WP/02 – FOLLOW-UP ACTION FROM MET/IE WG/20 (Secretariat)

2.1. The Meeting reviewed and updated the List of Actions as recorded by MET/IE WG/20, which included unresolved actions from previous MET/IE WG meetings, as presented in **Appendix A** of this Report.

2.2. The Meeting was pleased to consider eleven (11) action items were completed, and eight (8) closed (due to the action being integrated into the work plan or superseded by other activities). These included the following action items related to the Regional OPMET Bulletin Exchange (ROBEX) Handbook, which were addressed in WP/10 (under Agenda Item 6) and would be completed with the publication of the ROBEX Handbook 15th Edition: MET/IE WG/20 action items 07, 08 and 11, and MET/IE WG/19 action items 02 and 11.

2.3. In addition, the Secretariat reported the recent completion of one amendment to the ICAO APAC Air Navigation Plan (ANP) concerning Table MET II-2 (originated by New Zealand) and expected to complete unresolved ANP-amendment action items soon, including MET/IE WG/20 action items 02 and 10, and MET/IE WG/18 action item 20.

WP/03 – FOLLOW-UP ACTION FROM MET SG/26 (Secretariat)

2.4. As in para 2.2. above, the Meeting considered two (2) actions from the MET SG List of Actions, i.e., MET SG/26 action item 06 and MET SG/25 action item 14, which were addressed in WP/10 (under Agenda Item 6) and would be completed with the publication of the ROBEX Handbook 15th Edition. The Meeting proposed updates to the MET SG List of Actions for further consideration by the MET SG, as presented in **Appendix B** of this Report.

WP/04 – FOLLOW-UP ACTION FROM APANPIRG/33 (Secretariat)

2.5. The Thirty-third Meeting of the Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/33) adopted three (3) Conclusions of direct relevance to the work plan of the MET SG and MET/IE WG:

- Conclusion 33/12 – *WAFS, SADIS and WIFS upgrades*;
- Conclusion 33/13 – *0.25-degree WAFS hazard data*; and
- Conclusion 33/14 – *Update of Information in APANPIRG Air Navigation Deficiencies Reporting Form*.

2.6. The Meeting noted that the APANPIRG/33 Conclusions 33/12 and 33/13 were adopted from the Draft Conclusions MET SG/26/03 and MET SG/26/04.

2.7. The Meeting recalled the November 2023 and 2024 timeframe for States to make necessary changes for the World Area Forecast System (WAFS)-related upgrades in Conclusions 33/12 and 33/13, particularly the discontinuation of 1.25-degree hazard data in November 2023. In addition, it highlighted the urgency for completion of the Secretariat follow-up action on the State letter urging States to take recommended action on APANPIRG/33 Conclusions 33/12 and 33/13.

2.8. Furthermore, the Meeting highlighted the urgency for ICAO to arrange supplementary assistance, such as the advertised Aviation Meteorology Officer secondment from the States, to provide adequate Secretariat support for progressing the MET/IE WG actions.

3. Meteorological information exchange schemes

3.1. No papers were discussed under this agenda item. Therefore, the Chair suggested removing this agenda item for the next Meeting. In addition, the Meeting considered adding a new agenda item for the next Meeting on System-Wide Information Management (SWIM). [**ACTION MET/IE WG 21 – 01**]

4. Meteorological information exchange in digital form

WP/06 – LATEST GLOBAL DEVELOPMENT OF IWXXM AND PLANNED RELEASES (Hong Kong, China)

4.1. The latest approved version of the ICAO Meteorological Information Exchange Model (IWXXM), Version 2021-2, published on 15 November 2021, is compatible with Amendments 79 and

80 to ICAO Annex 3 and reflects a new semantic versioning scheme. A compatibility table (Table 1) highlights the compatibility of IWXXM packages across IWXXM versions.

Table 1: Compatibility table showing IWXXM versions, associated report packages, and relevant ICAO Annex 3 requirements

IWXXM Version	METAR/ SPECI	TAF	SIGMET	AIRMET	TCA	VAA	SWA	WAFS SIGWX F/C	Requirements
1.1	1.1.0	1.1.0	1.1.0	N/A	N/A	N/A	N/A	N/A	Am76
2.1	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1	2.1.1	N/A	N/A	Am77
3.0	3.0.0	3.0.0	3.0.0	3.0.0	3.0.0	3.0.0	3.0.0	N/A	Am78
2021-2	3.1.0	3.0.1	4.0.0	3.1.0	3.1.0	3.1.0	3.0.1	1.0.0	Am79 + Am80
2023-1 (undergoing WMO FT approval)	3.1.0	3.0.1	4.0.1	3.1.1	3.1.0	3.1.0	3.0.1	1.1.0	Am79 + Am80

4.2. The Meeting also noted that to resolve issues identified in Version 2021-2, a new version of IWXXM, Version 2023-1, is expected to be published in May 2023 (subject to the WMO Fast Track approval procedures).

4.3. In addition, a new version to comply with Amendment 81 to ICAO Annex 3 is expected to be approved in 2024 (subject to the final approval of Amendment 81).

4.4. The Meeting noted that, according to the compatibility table, IWXXM formatted METAR/SPECI*, SIGMET†, AIRMET‡, TCA§, VAA**, and SWA†† messages issued in IWXXM Version 3.0 will not comply with the latest amendment (Amendment 80) to ICAO Annex 3, noting even the minor changes to the IWXXM schema for TAF‡‡ can result in non-compliance with ICAO Annex 3.

4.5. Considering the need for States to ensure compliance with ICAO Annex 3, the Meeting noted that the producers of IWXXM reports should implement or upgrade their systems to support at least IWXXM Version 2021-2. Therefore, the Meeting formulated the following Draft Conclusion:

Draft Conclusion MET/IE WG/21-01: IWXXM VERSION COMPATIBILITY	
What: That, States are requested to ensure that MET service providers, air navigation service providers (ANSPs), airlines and other end users do the following: a) make the necessary system upgrades to support the IWXXM version which complies with the latest amendment to Annex 3 as stated in the	Expected impact: ☐ Political / Global ☐ Inter-regional

* METAR/SPECI – Aerodrome routine meteorological report/aerodrome special meteorological report (see ICAO Annex 3, Chapter 4 and Appendix 3 for further details).
† SIGMET – Information concerning specified en-route weather and other phenomena (see ICAO Annex 3, Chapter 7 and Appendix 6 for further details).
‡ AIRMET – Information concerning specified en-route weather phenomena (see ICAO Annex 3, Chapter 7 and Appendix 6 for further details).
§ Tropical Cyclone Advisory – information regarding tropical cyclones (see ICAO Annex 3, Chapter 3 and Appendix 2 for further details).
** Volcanic Ash Advisory – information regarding volcanic ash in the atmosphere (see ICAO Annex 3, Chapter 3 and Appendix 2 for further details).
†† Space Weather Advisory – information on space weather phenomena (see ICAO Annex 3, Chapter 3 and Appendix 2 for further details).
‡‡ TAF – Aerodrome forecast (see ICAO Annex 3, Chapter 6 and Appendix 5 for further details).

IWXXM compatibility table*; and b) prepare for future system upgrades to support future IWXXM versions driven by further amendments to Annex 3. (*Link to the IWXXM capability table: https://github.com/wmo-im/iwxxm/wiki/Package-Compatibility)	☐ Economic ☐ Environmental ☒ Ops/Technical
Why: Most States are generating and exchanging IWXXM OPMET data in version 3.0. With the evolution of ICAO Annex 3, IWXXM version 3.0, which complied with Amendments 78 to Annex 3, is no longer compliant with Amendments 80 to ICAO Annex 3. To avoid the potential impact to operations due to IWXXM version compatibility issues of the systems, States are required to upgrade the systems for generating, exchanging and consuming IWXXM reports to support the IWXXM version which complies with the latest amendment to Annex 3.	Follow-up: ☒Required from States
When: 29-Mar-23	Status: Draft to be adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

WP/07 – UPDATES TO IWXXM FAQs – LESSON LEARNT AND COMMON ISSUES (Hong Kong China and New Zealand)

4.6. In response to MET/IE WG/20 action item 04, Hong Kong China and New Zealand developed updates to the IWXXM Implementation in APAC Region – FAQs (IWXXM FAQs) based on lessons learnt from the monitoring of IWXXM validation.

4.7. The lessons learnt and common issues identified during the implementation and monitoring of IWXXM exchange via the Air Traffic Services Message Handling System (AMHS) were incorporated into a new Section 14, titled Lesson learnt and common issues, in draft updates to the IWXXM FAQs.

4.8. The Meeting appreciated the new information and suggested minor editorial changes to the IWXXM FAQs in paras 5.3 and 7.1 - 7.3.

4.9. Given the above, the Meeting considered the updates would provide an additional helpful information resource on IWXXM implementation in the APAC Region and, therefore, adopted the following Decision:

Decision MET/IE WG/21-02: UPDATES TO IWXXM FAQs	
What: That, the MET/IE WG endorses the updates to the IWXXM FAQs document in WP/07 for sharing with States and the publishing of the updated version of IWXXM FAQs to the APAC eDocument website.	Expected impact: ☐ Political / Global ☐ Inter-regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: The IWXXM FAQs document has proven a useful guide to assist States with their implementation of IWXXM. The inclusion of recent learnings from States will add further value to this IWXXM FAQs document.	Follow-up: ☐Required from States
When: 29-Mar-23	Status: Adopted by Subgroup
Who: ☐Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:	

WP/14 – UPDATE ON ONLINE REGISTER OF APAC IWXXM EXCHANGE STATUS (Australia and Hong Kong China)

4.10. The Meeting noted updates to the IWXXM online register dated 1 March 2023, indicating the capabilities of APAC Regional OPMET Centres (ROCs) and National OPMET Centres (NOCs) to receive and disseminate IWXXM messages routinely. In addition, the Meeting noted eight ROCs capable of routinely receiving and disseminating IWXXM messages in the APAC Region. However, some ROCs and NOCs were still unprepared to receive IWXXM messages via AMHS. While some States indicated the capability to generate IWXXM MET reports, they could still not disseminate them to ROCs as the necessary AMHS with File Transfer Body Part (FTBP) and Interpersonal Message Heading Extension (IHE) for IWXXM exchange was not yet implemented at NOCs.

4.11. In addition, a new table added to the register reflects the progress of the inter-regional exchange of IWXXM OPMET data made by Inter-Regional OPMET Gateways (IROGs). The register indicated that the inter-regional exchange of IWXXM was currently only enabled with APAC and Europe, with data being exchanged between the IROGs in Singapore and London.

4.12. Further updates to the IWXXM online register, based on the input received from some States during the Meeting, but not covered in the WP/14, included the following:

- IWXXM exchange status of APAC IROGs with African Region and South American Region
- Increase of AMHS message size limit to 4MB for ROC Bangkok

4.13. The Meeting requested IROGs to provide updates for each of the interregional circuits in the IWXXM online register. [**ACTION MET/IE WG 21 – 02**]

4.14. Given that the global availability of IWXXM data depended on the capability of the IROGs in APAC and neighbouring Regions to exchange IWXXM messages, the Meeting discussed the need to seek support from the ICAO Aeronautical Communication Services Implementation Coordination Group (ACSICG) to support network connections with other ICAO regions. The discussions noted the need for both primary and secondary/redundant network links. [Note: further discussion on this matter is in para. 5.7. of this Report]

4.15. The Meeting considered the need for global action and formulated the following Draft Conclusion:

Draft Conclusion MET/IE WG/21-03: GLOBAL EXCHANGE OF IWXXM	
What: That, ACSICG prioritise the implementation of intra- and inter-region network circuits, including support for the Air Traffic Services Message Handling System (AMHS) with File Transfer Body Part (FTBP) and Interpersonal Message Heading Extension (IHE), to support the global exchange of messages in the ICAO Meteorological Information Exchange Model (IWXXM) form.	Expected impact: ☐ Political / Global ☒ Inter-regional ☒ Economic ☐ Environmental ☒ Ops/Technical
Why: Aviation users require access to global OPMET information provided in IWXXM form. Without suitable communication network connections, global exchange will not be possible, preventing users from safely migrating from text to new IWXXM services.	Follow-up: ☐Required from States
When: 29-Mar-23	Status: Draft to be adopted by Subgroup

Who:	☐Sub groups ☐APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other:

4.16. In addition, although the link to the register was published in the ICAO APAC ROBEX Handbook, the Meeting suggested greater visibility of the register would encourage States to share updates on their IWXXM capabilities and increase the awareness of other enabling ICAO APAC groups on the latest IWXXM exchange status. Therefore, the Meeting requested the Secretariat to include the link to the register on the ICAO APAC Office "eDocuments" website [**ACTION MET/IE WG 21 – 03**]

WP/05 – AUSTRALIA TAF EXTENSIONS AND FILENAMES FOR INDIVIDUAL IWXXM TAFS (Australia)

4.17. Australia has implemented the capability to include TAF extensions in individual IWXXM TAF reports and IWXXM TAF bulletins and is preparing to send test products internationally to interested recipients, including Hong Kong China and New Zealand. In addition, Australia plans to replace its operational IWXXM TAF bulletins with the TAF extensions bulletins.

4.18. Australia is also testing the dissemination of individual TAF reports in IWXXM format. However, as there is no existing convention on the allocation of a filename for individual TAF reports, Australia is considering using the following options:

- A simple filename with no date/time, such as TAF_ICAOID.xml (Eg TAF_YSSY.xml)
- A filename with the date/time included, such as TAF_ICAOID_YYYYMMDDhhmm.xml (Eg TAF_YSSY_202303012250.xml)
- The current filename format for TAF bulletins, with CCCC replaced with ICAO ID (Eg LTAU99YSSY012300_C_YSSY_20230301225005.xml)

4.19. The Meeting noted that rather than adopting a single filename convention, different filename conventions may be useful to meet different use cases.

IP/02 – UPDATES ON THE IMPLEMENTATION OF IWXXM IN INDONESIA (Indonesia)

4.20. Indonesia provided updated information on the implementation of the IWXXM format in Indonesia.

IP/03 – UPDATES ON THE IMPLEMENTATION OF IWXXM IN CHINA (China)

4.21. China provided an update on its experience implementing OPMET exchange in IWXXM in China.

IP/04 – UPDATE ON IWXXM IMPLEMENTATION IN HONG KONG, CHINA (Hong Kong, China)

4.22. Hong Kong, China provided an update on implementing IWXXM in Hong Kong, China.

IP/06 – STATUS AND PLANS FOR IMPLEMENTATION OF IWXXM IN THAILAND (Thailand)

4.23. Thailand provided a brief overview of the status and plans for implementing IWXXM in Thailand.

IP/08 – STATUS AND PLANS FOR IMPLEMENTATION OF IWXXM IN CAMBODIA

(Cambodia)

4.24. Cambodia provided an update on its status in the implementation of the IWXXM.

IP/09 – UPDATE ON IWXXM IMPLEMENTATION IN SINGAPORE (Singapore)

4.25. Singapore provided an update on the implementation of IWXXM in Singapore.

5. Quality control, monitoring and management of meteorological information exchange

WP/09 – ASIA/PAC INTER-REGIONAL OPMET GATEWAY BACKUP EXERCISE BETWEEN IROG SINGAPORE AND IROG BANGKOK (Singapore)

5.1. IROGs Singapore and Bangkok conducted their fifth IROG backup exercise on 29 September 2022. During the exercise, IROG Singapore took over IROG Bangkok's role in relaying the OPMET messages from APAC[§§] to MID[***], and ASIA[†††] to AFI[‡‡‡] between 0200 UTC and 0800 UTC. In addition, both IROGs monitored and recorded the reception and transmission of the OPMET messages.

5.2. IROG Singapore successfully routed 550 out of 550 (100%) METAR bulletins and 87 out of 87 (100%) TAF bulletins to MID/AFI during the exercise. In addition, the exercise validated the dissemination process for notification between IROG Singapore and IROG Bangkok. The handover and responsibility takeover procedures are functional in the event IROG Bangkok experiences technical problems.

5.3. In response to a question and discussion on the possibility of an IROG backup exercise on IWXXM messages, the Meeting invited Singapore and Thailand to investigate the feasibility and possible timeline for the IWXXM IROG backup exercise. [**ACTION MET/IE WG 21 – 04**]

WP/18 – ASIA/PAC INTER-REGIONAL OPMET GATEWAY BACKUP EXERCISE BETWEEN IROG BANGKOK AND IROG SINGAPORE (Thailand)

5.4. IROGs Bangkok and Singapore conducted their eighteenth annual real-time backup exercise on 14 September 2022 to disseminate APAC OPMET data to the World Area Forecast Centre (WAFC) London by IROG Bangkok if IROG Singapore experiences technical problems.

5.5. The backup test results showed that IROG Singapore received 493, while IROG Bangkok received 492 and transmitted 492 (99.80%) METAR bulletins and 91 of 91 (100%) TAF bulletins to IROG London during the test.

5.6. Furthermore, IROG Bangkok received and relayed the METAR and TAF bulletins with an average transit time of 0.02 and 0.08 minutes.

5.7. In a related discussion, the Meeting requested the Secretariat to lead the drafting of a paper to the ACSICG to facilitate the establishment of redundant paths (primary circuit and backup paths) in consultation with the counterpart in other Regions to support the reliable implementation of Annex 3 IWXXM provisions on a global scale. [**ACTION MET/IE WG 21 – 05**]. In addition, the possibility of a conjoint meeting session of the MET/IE WG and ACSICG in 2024 would be explored. [**ACTION MET/IE WG 21 – 06**]

[§§] ICAO Asia and Pacific Regions
[***] ICAO Middle-East Region
[†††] ICAO Asia Region
[‡‡‡] ICAO Africa-Indian Ocean Region

WP/17 – ASIA/PACIFIC PERFORMANCE INDICES (Thailand)

5.8. Thailand presented the result of OPMET monitoring in APAC Region carried out by the five Regional OPMET Data Banks (RODBs): Bangkok, Brisbane, Nadi, Singapore, and Tokyo during 1-30 November 2022, and the Report of Performance Indices (PIs) was produced by RODB Bangkok.

5.9. The Meeting noted that the monitoring results indicated significant improvement in the PIs in 2022 compared with 2021.

5.10. The Meeting also noted the related action from the previous Meeting, MET/IE WG/20 action item 05, for the designated ad hoc group to review the PIs used in APAC OPMET monitoring, which was yet to progress. Thailand agreed to lead the action in coordination with the Secretariat, Chairs, New Zealand, Hong Kong China and Australia. The Meeting also invited the above ad hoc group to consider monitoring the timeliness of IWXXM messages. [**ACTION MET/IE WG 21 – 07**]

IP/07 – IMPLEMENTATION OF IWXXM SPECIFIC STATISTICS (Thailand)

5.11. Thailand described the implementation of IWXXM-specific statistics at RODB Bangkok.

5.12. The Meeting appreciated the significant progress in developing the new IWXXM statistics, which demonstrated that many States are now distributing IWXXM; however, many States are generating IWXXM through translation which is dependent on the quality of traditional alphanumeric code (TAC)-formatted information, otherwise the translated IWXXM does not pass validation, preventing its reliable use.

5.13. The Meeting noted that the IWXXM statistics during 1-30 November 2022 presented in the paper reflected the IWXXM validation of version 3.0 only and noted that Thailand has recently upgraded the validation software to support the validation for version 2021-2.

5.14. The Meeting invited Thailand to provide the MET/IE WG with further advice on the problems identified in validating IWXXM v2021-2 form. **[ACTION MET/IE WG 21 – 08]**

5.15. Given the information provided by Thailand highlighted the need to ensure IWXXM systems support compliance with ICAO Annex 3, the Meeting formulated the following Draft Conclusion:

<table>
<tr><th colspan="2">Draft Conclusion MET/IE WG/21-04: PROVISION OF QUALITY METEOROLOGICAL INFORMATION</th></tr>
<tr><td>What: That, States are reminded that the provision of specified meteorological information in IWXXM form has been an ICAO Annex 3 standard requirement since 2020. Where a State provides, or arranges the provision of, IWXXM information through translation services (from traditional alphanumeric code (TAC)-formatted information), the TAC-formatted information must be ICAO compliant otherwise translation errors occur, resulting in higher costs for users and preventing the benefits of IWXXM being obtained.</td><td>Expected impact:
☐ Political / Global
☐ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Most States are now producing meteorological information in IWXXM. However, users will only transition from TAC to IWXXM forms when they can reliably access quality IWXXM information from all the required States.</td><td>Follow-up:
☒Required from States</td></tr>
<tr><td>When: 29-Mar-23</td><td>Status: Draft to be adopted by Subgroup</td></tr>
</table>

Who:	☐Sub groups ☒APAC States ☐ICAO APAC RO ☐ICAO HQ ☐Other:

IP/05 – TROUBLE AT RODB BRISBANE IN RECEIVING METAR DATA WITH HEADING SAID32 AND SAID 33 (Indonesia)

5.16. Indonesia provided information on resolving an issue identified in APAC OPMET monitoring, which had impeded the exchange of METAR bulletins from Indonesia to RODB Brisbane.

5.17. The Meeting noted the importance of OPMET monitoring in identifying and resolving such issues.

6. Guidance material related to meteorological information exchange

WP/10 – ROBEX HANDBOOK UPDATES (Secretariat)

6.1. The Meeting reviewed draft updates for the Asia Pacific ROBEX Handbook, Fifteenth Edition — March 2023. The updates included previously endorsed and requested changes by MET/IE WG/19, MET/IE WG/20, MET SG/25 and MET SG/26, which had not yet been finalised and published.

6.2. The Meeting also noted that subject to the outcomes of the Meeting's relevant discussions, the draft updates included the proposed changes in WP/12, WP/13 and WP/19 (discussed further in the paragraphs below). In addition, the draft updates also included minor changes to focal point information as requested by the States concerned.

6.3. In addition to the above, the Meeting proposed the following updates be included in the ROBEX Handbook, Fifteenth Edition: **[ACTION MET/IE WG 21 – 09]**

- Remove the requirement to indicate the RODB responsible for storing the METAR and TAF bulletins in bold text in Appendix A and B; because the Meeting agreed that the need for this feature no longer existed;
- Correct the references to IWXXM TAF bulletins from "LC" to "LT" in para. 13.3.1.1 and Appendix D, para. 2.1.1; and
- Include updates in Appendices A and B to reflect the changes to the METAR and TAF bulletins SAPK31 and FTPK31, as requested by Pakistan by email to ICAO.

6.4. The paper also proposed the re-introduction of bolded text in the Appendices A and B to indicate the RODB's responsible for storing the bulletins. However, following discussion, the Meeting decided this feature of the information is no longer relevant, so it will be entirely removed from the ROBEX Handbook.

6.5. The Meeting noted that the Secretariat would publish the above updates in the ROBEX Handbook, Fifteenth Edition — March 2023, after the Meeting, as presented in **Appendix F and G** of this Report.

6.6. In a related discussion, the Meeting recalled that progress was needed on the action item from the previous Meeting, MET/IE WG/20 action item 12, which requested the Secretariat to document the steps States should take to: a) effect changes to the ROBEX scheme; and b) notify States of changes to MET service.

WP/11 – UPDATES TO ROBEX HANDBOOK (China)

6.7. China proposed updates to the ROBEX Handbook, Appendix A, to reflect the change in observation time for bulletins containing METAR for ZBSJ and ZWSH from HH+00 and HH+30 to HH+00 only.

6.8. The Meeting noted the proposed updates by China are included in the ROBEX Handbook, Fifteenth Edition — March 2023, as presented in **Appendix F and G** of this Report. [**ACTION MET/IE WG 21 – 10**]

WP/12 – UPDATE OF AERODROME FORECAST ISSUANCE AND VALIDITY (30TAF3) (New Zealand)

6.9. New Zealand presented proposed updates to the ROBEX Handbook, Table B: Collection and Dissemination of TAF (FT) Bulletins, to reflect the recent implementation of 30-hour validity TAF for Auckland, Wellington, and Christchurch International Aerodromes and cessation of the trend service with 30-hour TAF routinely issued every three hours.

6.10. Noting there is no current way within the ROBEX Handbook to easily indicate that a TAF is updated 3-hourly with the validity period alternating between 27 hours and 30 hours per issue, New Zealand proposed to change the format of Table B to separate the bulletin and TAF information to facilitate clearer communication of the TAF availability and validity period.

6.11. The Meeting agreed to include the proposed aerodrome-related updates by New Zealand in Appendix B of the ROBEX Handbook, Fifteenth Edition — March 2023, as presented in **Appendix F and G** of this Report. [**ACTION MET/IE WG 21 – 11**]. The Meeting also suggested a minor change* to the format changes proposed by New Zealand to Table B (of the ROBEX Handbook) and agreed that the format changes would be incorporated in the following proposal for updates to the ROBEX Handbook. [**ACTION MET/IE WG 21 – 12**] (* move the "Start of validity" to Column 2, TAF Bulletin)

WP/13 – UPDATES TO ASIA PACIFIC ROBEX HANDBOOK (Hong Kong, China)

6.12. Hong Kong, China presented proposed updates to the ROBEX Handbook, Appendix A, Table A: Collection and Dissemination of METAR (SA) Bulletins, and Appendix B, Table B: Collection and Dissemination of TAF (FT) Bulletins, to reflect the inclusion of two aerodromes, RPLC and RPVP in Philippines, in the Hong Kong METAR/SPECI and TAF bulletins.

6.13. In addition, Hong Kong, China proposed updates to reflect the implementation of TAF issuance at 3-hourly intervals for VHHH and reorganise its TAF bulletin FTHK31 by grouping aerodromes with the same TAF issuance frequency and same validity period into three series types viz. FTHK31, FTHK32 and FTHK33.

6.14. The Meeting agreed to include the proposed updates in the ROBEX Handbook, Fifteenth Edition — March 2023, as presented in **Appendix F and G** of this Report. [**ACTION MET/IE WG 21 – 13**]

WP/19 – UPDATES TO ROBEX HANDBOOK (Thailand)

6.15. Thailand presented proposed updates to the ROBEX Handbook, Appendix A, Table A: Collection and Dissemination of METAR (SA) Bulletins, and Appendix B, Table B: Collection and Dissemination of TAF (FT) Bulletins, to reflect changes to the aerodromes in bulletins disseminated by Bangkok, the bulletins times and available times of METAR bulletins, and the TAF validity in TAF bulletins.

6.16. In addition, Thailand proposed updates to include ROC Beijing (ZBBBYPYX) in disseminating all Bangkok METAR/TAF Bulletins and reflecting the current ROBEX focal point information for Thailand in Appendix I.

6.17. The Meeting agreed to include the proposed updates in the ROBEX Handbook, Fifteenth Edition — March 2023, as presented in **Appendix F and G** of this Report. [**ACTION MET/IE WG 21 – 14**]

FLIMSY/01 – METNO GUIDANCE IN ROBEX HANDBOOK (Hong Kong China and Australia)

6.18. APAC ROBEX Handbook, Appendix E was updated with the addition of General rules in METNO Procedure when the ROBEX Handbook was updated from the 13th to 14th edition published in 2022. As a result, inconsistencies or ambiguities were identified between the METNO procedures mentioned in Section 13.1 - Changes to OPMET Bulletin Procedures and Appendix E Section 1 – METNO Procedures – General rules.

6.19. The Meeting was informed that the ICAO Meteorology Panel (METP) Working Group on Meteorological Information Exchange (WG-MIE) was looking into developing a globally consistent procedure for METNO. Therefore, the Meeting tasked the Secretariat, Chair, Vice Chair and METNO focal points and invited the RODBs to keep abreast of the METP developments and develop a proposal to improve the APAC ROBEX Handbook for consideration by the MET SG. [**ACTION MET/IE WG 21 – 15**]

7. Future work program and terms of reference

WP/15 – REVIEW MET/IE WG WORK PROGRAM AND TERMS OF REFERENCE (Secretariat)

7.1. The Meeting reviewed the MET/IE WG terms of reference and work plan document, previously reviewed by MET SG/26, and proposed updates for MET SG/27 review. The proposed updates are presented in **Appendix C** of this Report.

7.2. Noting that the group membership, as presented in the terms-of-reference, needed updating, the Meeting requested the Secretariat to contact the listed members not in attendance at MET/IE WG/21 to confirm their membership status on the MET/IE WG. [**ACTION MET/IE WG 21 – 16**]

8. Any other business

8.1. No discussion under this item. Note: Discussion on WP/16 – PROPOSED AMENDMENT TO ICAO Annex 3 was moved to the conjoint session with MET/S WG/13.

9. Next Meeting

9.1. The Meeting proposed the following (tentative) dates for the next Meeting of the MET/IE WG:

- 18-20 March 2024 (aligned with MET/S WG) or
- April 2024 (aligned with the ACSICG)

– – – – – – – – – – – – –

REPORT ON AGENDA ITEMS – CONJOINT SESSION OF MET/IE WG/21 AND MET/S WG/13

1. Volcanic ash advisory centre (VAAC) backup tests

1.1 No papers were discussed under this agenda item. However, the MET/S WG/13 meeting session reviewed IP/09 under agenda item 6 in which the VAACs Darwin, Tokyo and Wellington reported information on VAAC backup tests conducted between VAACs Darwin-Wellington, Darwin-Tokyo, Washington-Montreal, and Darwin-Washington.

2. SIGMET tests

WP/C01 – REVIEW OF WS SIGMET TEST 2022 (Singapore)

2.1. The ICAO APAC Regional SIGMET Test 2022 for weather and other phenomena (apart from tropical cyclone and volcanic ash) was conducted on 23 November 2022.

2.2. Data from the test, as compiled, analyzed and presented by the SIGMET test focal point from Singapore, indicated the following results:

- The rate of participation in the SIGMET test by States was 86%, which is an improvement compared to 79% in 2021 and 2020;
- SIGMET test messages were not received from four (4) States: Afghanistan, DPR Korea, Nauru and Papua New Guinea;
- The average rate of reception of SIGMET test messages at APAC RODBs, Bangkok, Brisbane, Singapore and Tokyo, and ROC London was 99%; however, the rate of reception at RODB Nadi was considerably lower at 65%; and
- A few errors were identified in the test messages: one (1) incorrect priority indicator in a message header; and two (2) messages with invalid formats.

2.3. The 2022 SIGMET test was the first test to include IWXXM format SIGMETs, in addition to the traditional alphanumeric format. Nine MWOs issued IWXXM format SIGMETs during the test: Hong Kong, Taibei, Nadi, Tokyo, Wellington, Manila, Singapore, Honiara and Bangkok.

2.4. The Meeting noted the MET/IE WG and MET/S WG activities concerning follow-up on the SIGMET test results. The Secretariat, in coordination with the (MET/S WG) ad hoc group on air navigation deficiencies, would advise States concerned of the deficiencies identified in the SIGMET test (i.e., non-participation in the test, message reception issues, and message errors) and propose corrective actions.

2.5. In addition, the Meeting was reminded that ICAO Annex 3, Table A6-1A, *Template for SIGMET and AIRMET messages*, enables States to use the status indicator TEST[§§§] to indicate that a SIGMET test is taking place and the message may contain information that should not be used operationally. Therefore, States are able to send SIGMET test messages as required at any time throughout the year, e.g., to validate the rectification of deficiencies in their systems, or to ensure effective dissemination following system upgrades.

WP/C02 – RESULTS OF SIGMET TESTS 2021 – WC and WV (Japan)

[§§§] Applicable from 7 November 2019

2.6. The ICAO APAC Regional SIGMET Tests 2022 for tropical cyclone and volcanic ash were conducted on 9 and 16 November 2022, respectively.

2.7. Data from the tests, as compiled, analyzed and presented by the SIGMET test focal point from Japan, indicated the following results:

- WC SIGMET test bulletins were not received from four (4) (APAC) States: DPR Korea, Myanmar, Nauru and Papua New Guinea;
- WV SIGMET test bulletins were not received from five (5) (APAC) States: Afghanistan, Cambodia, DPR Korea, Nauru and Papua New Guinea;
- The overall availability of WC and WV test bulletins was 78% and 87%, respectively, which was slightly better than in 2021 (76% and 86%);
- Few errors were identified in the (APAC[****]) WC and WV test bulletins: one (1) incorrect priority indicator in a message header; and eight (8) messages with errors in the SIGMET code elements; and
- SIGMET test messages in the IWXXM form were received from some (APAC) States, including: Australia, China (MWO Hong Kong and MWO Taibei), Fiji, Japan, Singapore, Solomon Islands and Thailand.

2.8. The Meeting noted the follow-up activities by New Zealand, French Polynesia, Australia and Mongolia in resolving issues related to the availability of IWXXM test format SIGMETs. Further, the Meeting noted Fiji's explanation of the early date-time group in their TCA and WV/WC SIGMET headers relating to each of the messages being prepared ahead of time.

2.9. The Meeting appreciated the efforts of RODB Tokyo to extend the WV and WC test analysis to include information on the number of test SIGMETs issued by each MWO, relating to the number of separate advisories they received from each of their related VAACs or TCACs (ref: MET/IE WG/19 and MET/S WG/11 action item 02, which the Meeting considered was now closed).

2.10. Regarding the data on SIGMET test messages in IWXXM form, the Meeting noted that the designated ad hoc group had developed updates in the ICAO APAC Regional SIGMET Test Procedures 2022 to include guidance on SIGMET test messages disseminated in the IWXXM form (ref: MET/IE WG/20 action item 16, which the Meeting considered was now completed).

2.11. The Chair encouraged States to utilize the SIGMET test functionality to validate SIGMET capability following system changes.

2.12. To take full advantage of the IWXXM test messages and consider the IWXXM-specific statistics (ref: MET/IE WG/21 IP/07), the Meeting requested Thailand, in coordination with the SIGMET test focal points (Japan and Singapore), to include the IWXXM-specific statistics, such as IWXXM versions, in future SIGMET test results. [**ACTION MET/IE WG 21 – 17**]

2.13. The Meeting further requested the Secretariat and Chair in coordination with the designated ad hoc group to ensure that the APAC Regional SIGMET Guide be updated to include MWO Ulaan Baatar in the MWO list and to include the additional headers used by MWO Tahiti for their SIGMETs. [**ACTION MET/S WG 13 – 01**]

[****] In addition to the participation by APAC Region States, the ICAO APAC SIGMET Test procedures, and the SIGMET test results presented, include test messages sent by TCACs, VAACs and MWOs in neighbouring ICAO Regions.

3. Any other business

MET/IE WG/21 WP/16 and MET/S WG/13 – PROPOSALS FOR THE AMENDMENT OF ICAO ANNEX 3 (Secretariat)

3.1. ICAO State letters Ref.: AN 10/1-23/1 and AN 2/36-23/6, dated 26 January and 13 February 2023, respectively, presented several proposals for the amendment of ICAO Annex 3. Accordingly, States and appropriate international organizations that wished to provide ICAO with any comments on the amendment proposals presented in the State letters were requested to do so no later than 26 July and 14 August 2023, respectively.

3.2. State letter, ref.: AN 10/1-23/1 presented proposals for the amendment of Annex 3, the new PANS-MET and consequential amendments to Annex 6 (Parts I, II and III), Annex 10 (Vol. II), Annex 11, Annex 15, PANS-ABC, PANS-AIM and PANS-ATM, arising from the fifth Meeting of the Meteorology Panel (METP/5).

3.3. State letter, ref.: AN 2/36-23/6 presented proposals for the amendment of Annex 3, Annex 4, Annex 10 (Vol. II and III), Annex 15, PANS-ABC, PANS-AIM, and the first edition of PANS-IM, arising from the Information Management Panel (IMP).

3.4. The proposed amendments presented in the State letters were envisaged for applicability on 28 November 2024 or, for proposed amendments related to quantitative volcanic ash information, on 27 November 2025.

3.5. State letter Ref.: AN 10/1-23/1 sets out details on the development of the restructured Annex 3 and the new PANS-MET and the amendments related to the following:

a) space weather information services;
b) quantitative volcanic ash concentration information;
c) the international airways volcano watch (IAVW);
d) the ICAO meteorological information exchange model (IWXXM);
e) the world area forecast system (WAFS); and
f) improved definition of meteorological authority and introduction of a new definition of meteorological service provider.

3.6. State letter Ref.: AN 2/36-23/6 sets out, among other proposals, details on the proposed amendment to Annex 3 concerning system-wide information management (SWIM) and a first edition of PANS-IM concerning aeronautical information management, SWIM and information security.

3.7. Background information and details of the proposals for the amendment of Annex 3 are provided in Attachments A to C of the State letter Ref.: AN 10/1-23/1 and Attachments A and H of the State letter Ref.: AN 2/36-23/6.

3.8. The Meeting noted that the proposals might require States, operators and service providers in the aviation system to implement significant changes, including the following:

- The transfer of the means of compliance for SARPs in Annex 3 into a separate PANS-MET;
- Increase the responsibility of the State's designated meteorological authority to include providing oversight and regulation of the meteorological service;
- Provide forecasts of quantitative volcanic ash concentration information;
- Provide the volcano observatory notice for aviation (VONA); and

- Provide meteorological information to users[††††] through information services (SWIM).

3.9. The Meeting was reminded that Initial Proposal 1 in Attachments B and C simply referred to the proposed restructured Annex 3 and new PANS-MET – with no new or changed provisions included. Initial Proposals 2-6 then build upon Initial Proposal 1 to introduce changes to the Standards and Recommended Practices (SARPs).

3.10. To help inform the APAC States on the proposed new provisions for quantitative volcanic ash concentration information, the Meeting invited the VAACs Darwin, Tokyo and Wellington to present explanatory information to the MET SG. [**ACTION MET/S WG 13 – 02**]

3.11. Concerning the proposals for amendment to Annex 3 concerning SWIM, the Meeting was informed that the METP was considering the removal of Annex 3 requirements for global exchange of MET information in the traditional alpha-numeric code form in 2029.

3.12. The Meeting was also informed that the proposed changes to the World Meteorological Organization qualification and competency requirements relating to Aeronautical Meteorological Forecasters and Aeronautical Meteorological Observers is available at the following website: https://community.wmo.int/en/activity-areas/aviation/resources/amp-qual-comp-amendments.

– – – – – – – – – – – – –

[††††] Users including: operators, flight crew members, air traffic services units, search and rescue services units, airport managements and others concerned with the conduct or development of international air navigation

LIST OF ACTIONS (MET/IE WG)

New action items recorded by MET/IE WG/21

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
MET/IE WG/21 **01**	Amend the MET/IE WG meeting agenda as follows: a) Remove the agenda item titled "Meteorological information exchange schemes"; and b) Add a new agenda item on "SWIM". [Ref: MET/IE WG/21 Report, para 3.1]	MET SG/27	Secretariat and Chairs	**TO COMMENCE**
MET/IE WG/21 **02**	The meeting requested IROGs to provide updates for each of the interregional circuits in the IWXXM online register. [Ref: MET/IE WG/21 Report, para 4.13]	MET SG/27	APAC IROGs	**TO COMMENCE**
MET/IE WG/21 **03**	Publish the link to the online register of APAC IWXXM exchange status on the ICAO APAC Office, "eDocuments", website. [Ref: MET/IE WG/21 Report, para 4.16]	MET SG/27	Secretariat	**TO COMMENCE**
MET/IE WG/21 **04**	Investigate the feasibility and possible timeline for conducting an IROG backup exercise for IWXXM data. [Ref: MET/IE WG/21 Report, para 5.3]	MET/IE WG/22	Singapore and Thailand	**TO COMMENCE**
MET/IE WG/21 **05**	Submit a paper to the ACSICG proposing action to facilitate the establishment of redundant paths (primary circuit and backup paths) in consultation with the counterpart in other Regions to support the reliable implementation of Annex 3 IWXXM provisions globally. [Ref: MET/IE WG/21 Report, para 5.7]	ACSICG/ 10	Secretariat and Chairs	**TO COMMENCE**
MET/IE WG/21 **06**	Submit a paper to the ACSICG proposing a conjoint meeting session of the MET/IE WG and ACSICG in 2024. [Ref: MET/IE WG/21 Report, para 5.7]	ACSICG/ 10	Secretariat and Chairs	**TO COMMENCE**
MET/IE WG/21 **07**	Review the Performance Indices (PIs) used in APAC OPMET monitoring, and consider monitoring the timeliness of IWXXM messages. [Ref: MET/IE WG/21 Report, para 5.10, and MET/IE WG/20 action item 05]	MET/IE WG/22	Ad hoc group: Thailand (lead), Secretariat, Chairs, New Zealand, Hong Kong China and Australia	**TO COMMENCE**
MET/IE WG/21 **08**	Provide the MET/IE WG with further advice on the problems identified in APAC OPMET monitoring in validating IWXXM v2021-2 form. [Ref: MET/IE WG/21 Report, para 5.14]	MET/IE WG/22	Thailand	**TO COMMENCE**
MET/IE WG/21 **09**	Include the following updates in the ROBEX Handbook, Fifteenth Edition: a) Remove the requirement to indicate the RODB responsible for storing the METAR and TAF bulletins in bold text in Appendix A and B; b) Correct the references to IWXXM TAF bulletins from "LC" to "LT" in para. 13.3.1.1 and Appendix D, para. 2.1.1; and c) Include updates in Appendices A and B to reflect the changes to the METAR and TAF bulletins SAPK31 and FTPK31, as requested by Pakistan by email to ICAO. [Ref: MET/IE WG/21 Report, para 6.3]	ASAP	Secretariat	**TO COMMENCE**
MET/IE WG/21 **10**	Include the updates to Appendix A of the ROBEX Handbook, Fifteenth Edition, as proposed by China and presented in Appendix F of the MET/IE WG/21 Report. [Ref: MET/IE WG/21 Report, para 6.8]	ASAP	Secretariat	**TO COMMENCE**
MET/IE WG/21 **11**	Include the aerodrome updates in the ROBEX Handbook, Fifteenth Edition, as proposed by New Zealand and presented in Appendix F of the MET/IE WG/21 Report. [Ref: MET/IE WG/21 Report, para 6.11]	ASAP	Secretariat	**TO COMMENCE**
MET/IE WG/21 **12**	Incorporate the changes to Table B format (as proposed by New Zealand in MET/IE WG/21, WP/12, and subject to the minor change suggested by the Meeting) in the proposal for updates to follow the publication of the ROBEX Handbook, Fifteenth Edition. [Ref: MET/IE WG/21 Report, para 6.11]	MET/IE WG/22	Secretariat	**TO COMMENCE**
MET/IE WG/21 **13**	Include the proposed updates in the ROBEX HANDBOOK, Fifteenth Edition, as proposed by Hong Kong, China and presented in Appendix F of the MET/IE WG/21 Report. [Ref: MET/IE WG/21 Report, para 6.12-6.14]	ASAP	Secretariat	**TO COMMENCE**

LIST OF ACTIONS (MET/IE WG)

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
MET/IE WG/21 **14**	Include the proposed updates in the ROBEX HANDBOOK, Fifteenth Edition, as proposed by Thailand and presented in Appendix F of the MET/IE WG/21 Report. [Ref: MET/IE WG/21 Report, para 6.15-6.17]	ASAP	Secretariat	**TO COMMENCE**
MET/IE WG/21 **15**	Keep abreast of the METP developments on METNO procedures and develop a proposal to improve the METNO procedure in the APAC ROBEX Handbook. [Ref: MET/IE WG/21 Report, para 6.19]	MET SG/27	Secretariat, Chair, Vice Chair and METNO focal points and invited the RODBs	**TO COMMENCE**
MET/IE WG/21 **16**	Contact the listed members that were not in attendance at MET/IE WG/21 to confirm their membership status on the MET/IE WG [Ref: MET/IE WG/21 Report, para 7.2]	MET SG/27	Secretariat	**TO COMMENCE**
MET/IE WG/21 **17**	Include the IWXXM-specific statistics, such as IWXXM versions, in future SIGMET test results. [Ref: MET/IE WG/21 and MET/S WG/13 Conjoint Session Report, para 2.12]	MET/IE WG/22	Thailand, in coordination with the SIGMET test focal points (Japan and Singapore)	**TO COMMENCE**

(Note: Agreed updates are indicated with ~~strikethrough~~ and highlighted text)

Unresolved action items recorded by MET/IE WG/20

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
MET/IE WG/20 **01**	Follow up with Australia on opportunities to combine the ICAO APAC 2022 Webinar on Space Weather and Australia and New Zealand's 2022 Space Weather Exercise. *[Ref: Report of MET/IE WG/20, para. 2.10.]*	Before MET SG/~~26~~27	Secretariat, in coordination with participants from Australia	**IN PROGRESS**
MET/IE WG/20 **02**	Coordinate the consequential amendments to the ANP (Volume II, Table MET II-2 – Aerodrome Meteorological Offices) and the ROBEX Handbook to reflect the requirements for MET service at QUANG NINH/Van Don International Airport (ICAO location indicator VVVD). *[Ref: Report of MET/IE WG/20, para. 3.5.]*	Before MET SG/~~26~~27	Secretariat, in coordination with participants from Vietnam	**IN PROGRESS** ANP PfA pending circulation by the Secretariat
MET/IE WG/20 **03**	Provide contact details for IROG Jeddah (Saudi Arabia) and IROG Johannesburg (South Africa) to the members from Thailand to discuss their support for IWXXM and AMHS/FTBP and the timing for the testing and implementation of the inter-regional IWXXM exchange. *[Ref: Report of MET/IE WG/20, para. 4.15.]*	Before MET SG/~~26~~27	Secretariat, in coordination with participants from Thailand	**IN PROGRESS**
MET/IE WG/20 **04**	Develop updates to the document *IWXXM implementation in APAC Region – FAQs* based on lessons learnt from monitoring IWXXM validation conducted by ROC Hong Kong. *[Ref: Report of MET/IE WG/20, para. 4.31.]*	Before MET SG/~~26~~27	Members from Hong Kong China, assisted by members from New Zealand	**COMPLETED** (ref: MET/IE WG/21, WP/07)
MET/IE WG/20 **05**	Invite interested WG members to form an ad hoc group to review the Performance Indices (PIs) used in APAC OPMET monitoring. *[Ref: Report of MET/IE WG/20, para. 5.13.]*	Before MET/IE WG/2~~1~~2	Secretariat and Chair MET/IE WG and designated ad hoc group, including Members from Thailand and ~~TBD~~New Zealand, Hong Kong China	**IN PROGRESS**
MET/IE WG/20 **06**	Use as the benchmark for OPMET monitoring the latest available ROBEX data provided by the Secretariat (rather than by the published ROBEX Handbook). *[Ref: Report of MET/IE WG/20, para. 5.15.]*	Before MET/IE WG/2~~1~~2	Thailand, in coordination with the Secretariat	**IN PROGRESS**
MET/IE WG/20 **07**	Update the ROBEX Handbook, Appendix I, to reflect changes in the focal point information for Thailand and Malaysia. *[Ref: Report of MET/IE WG/20, para. 6.2.]*	Before MET SG/~~26~~27	Secretariat, in coordination with participants from Thailand and Malaysia	**COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)

LIST OF ACTIONS (MET/IE WG)

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
MET/IE WG/20 **08**	Delete the list of area designators in the ROBEX Handbook, Appendix D, 2.1.2. c), which replicates WMO No. 386, Table C1, Part II – Area Designators and, therefore, is unnecessary in the ROBEX Handbook. *[Ref: Report of MET/IE WG/20, para. 6.3.]*	Next ROBEX Handbook update	Secretariat	**COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)
MET/IE WG/20 **09**	Develop updates to the ROBEX Handbook, Appendix E – *Procedure and Format of METNO bulletin for APAC ROBEX Bulletins* to clarify the procedures concerning the general area designator in the METNO Header (in paragraph 2.2.) and the responsibilities for issuing METNO messages. *[Ref: Report of MET/IE WG/20, para. 6.4.]*	Before MET SG/~~26~~27	Secretariat and ROBEX Focal Points from Australia, Hong Kong China, Japan and Singapore	**IN PROGRESS** (related to work underway by METP WG-MIE)
MET/IE WG/20 **10**	Coordinate with Indonesia to: a) Validate the proposed updates in WP/08, which concerned aerodrome names that were not reflected in the ANP, Table AOP I-1 – *International Aerodromes Required in the APAC Regions*; and b) Include the validated proposals in the next update of the ROBEX Handbook. *[Ref: Report of MET/IE WG/20, para. 6.9.]*	Next ROBEX Handbook update	Secretariat, in coordination with participants from Indonesia	**IN PROGRESS** ANP PfA pending circulation by the Secretariat
MET/IE WG/20 **11**	Coordinate with Mongolia to: a) Notify the regional focal point and team for management of the METNO process of the changes in IP/11; and b) Include the proposals in IP/11 in the next update of the ROBEX Handbook. *[Ref: Report of MET/IE WG/20, para. 6.14.]*	Next ROBEX Handbook update	Secretariat, in coordination with participants from Mongolia	**COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)
MET/IE WG/20 **12**	Document the steps States should take to: a) Effect changes to the ROBEX scheme; and b) Notify States of changes to MET service. *[Ref: Report of MET/IE WG/20, para. 6.15.]*	Before MET SG/~~26~~27	Secretariat	**IN PROGRESS**
MET/IE WG/20 **13**	Convene a quarterly meeting of the MET/IE WG (core) members to progress updates to the work plan and terms of reference, including assigning specific dates and responsibilities (incl. identifying a lead and supporting resources for activities) and merging Activities 1 and 2 in the work plan. After the Secretariat and Chairs of MET SG and WGs have prepared the integrated reporting template. *[Ref: Report of MET/IE WG/20, para. 7.5.]*	Before MET SG/~~26~~27	Chair MET/IE WG and Secretariat	**IN PROGRESS**
MET/IE WG/20 **14**	Coordinate a proposal to supplement the VAAC Backup Test Procedures in the Appendices of the APAC Regional SIGMET Guide with information on the backup arrangement with VAACs Washington and Montreal. *[Ref: Report of Conjoint Session of MET/IE WG/20 and MET/S WG/12, para. 1.4.]*	Before MET/IE WG/2~~1~~2	Members from VAAC Darwin	**IN PROGRESS**
MET/IE WG/20 **15**	Concerning the inclusion of MWOs not located in the APAC Region, perform a cross-check of the ICAO APAC SIGMET Test Procedures against the legacy FASID Tables MET 3A – *Tropical Cyclone Advisory Centres* and 3B – *Volcanic Ash Advisory Centres.* *[Ref: Report of Conjoint Session of MET/IE WG/20 and MET/S WG/12, para. 2.17.]*	Before MET SG/~~26~~27	Secretariat	**IN PROGRESS**
MET/IE WG/20 **16**	Develop a proposal to update the SIGMET Test Procedures to include disseminating SIGMET and advisory messages in IWXXM form. *[Ref: Report of Conjoint Session of MET/IE WG/20 and MET/S WG/12, para. 2.18.]*	Before MET SG/~~26~~27	MET/IE WG and MET/S WG designated ad hoc group	**COMPLETED** (Ref: SIGMET test procedures 2022)
MET/IE WG/20 **17**	Follow up with Myanmar on the appropriate addressing of letters from ICAO inviting participation in SIGMET tests. *[Ref: Report of Conjoint Session of MET/IE WG/20 and MET/S WG/12, para. 2.23.]*	Before MET SG/~~26~~27	Secretariat, in coordination with participants from Myanmar	**IN PROGRESS**
MET/IE WG/20 **18**	Submit a paper to MET SG requesting States to provide up to date contact information for letters from ICAO requesting the States to participate in SIGMET tests. *[Ref: Report of Conjoint Session of MET/IE WG/20 and MET/S WG/12, para. 2.24.]*	Before MET SG/~~26~~27	Secretariat	**TO COMMENCE**

Unresolved action items recorded by MET/IE WG/19

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
01	**Propose updates to the ROBEX Handbook:** to ensure clarity of the guidance concerning the ROCs' responsibilities for the distribution of IWXXM formatted OPMET data [ref: para. 2.5.]	~~May 2021~~ Before MET SG/27	WG	**To commence**
02	**Propose updates to the ROBEX Handbook**: to ensure the availability of the AFTN addresses for the designated APAC ROCs [ref: para. 2.6.]	~~May 2021~~ Before MET SG/27	WG	~~To commence~~ **COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)
05	**Propose updates to the ROBEX Handbook**: to include the necessary consequential changes to OPMET bulletins described in WP/08 (SAPS31 NFFN, SAPS32 NWWW, SAPS33 NTAA, SANG31 YBBN, FTPS31 NFFN, FTPS32 NWWW, FTPS33 NTAA, FTNG31 YBBN) and presented in Attachment A to WP/08 and to include information on the (KWBC) bulletins containing Pago Pago METAR and TAF [ref: para. 4.3.]	~~May 2021~~ Before MET SG/27	Secretariat	**PART COMPLETED** ROBEX HB 14th Ed.; updates pending concerning Pago Pago
11	**Propose updates to the ROBEX Handbook**: to include the OPMET exchange information for Van Don International Airport (VVVD), as advised by Viet Nam and presented in MET/IE WG/19, WP/15 – *A new international airport (VVVD) to join ROBEX network for international OPMET data exchange*. [ref: para. 6.11.]	May 2021	Viet Nam and Secretariat	~~**IN PROGRESS** MET/IE WG/20, IP/02~~ **COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)

Unresolved action items recorded by the conjoint session of MET/IE WG/19 and MET/S WG/11

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
01	State letter request to user States to ensure the relevant operational units participate in the VAAC backup tests and provide the VAACs with their current, valid AFTN addresses for receipt of the VAA messages.*[Ref: para. 1.1.-1.3., MET/IE WG/19 and MET/S WG/11 conjoint session]*	Before next scheduled test	Australia, New Zealand, Secretariat	~~**TO COMMENCE**~~ **CLOSED** (ref: MET/S WG work plan)
02	Investigate possible improvements to the template for the SIGMET test summary table to enable a more detailed analysis of the SIGMET tests, including analysis of more than one WC and/or WV SIGMET test message issued by the same MWO (which receives TCA and/or VAA from more than one TCAC and/or VAAC). *[Ref: para. 2.16., MET/IE WG/19 and MET/S WG/11 conjoint session]*	Before next scheduled test	SIGMET test Focal Points, Secretariat	~~**TO COMMENCE**~~ **COMPLETED**

Unresolved action items recorded by MET/IE WG/18 and MET/S WG/10

The following action items are applicable to one or both of the MET/IE WG and MET/S WG

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
Terms of Reference and Work Program				
01	**Terms of Reference and Work Program – online coordination:** Make use of regular online coordination meetings to facilitate progress on follow-up on the action items in the Task List/s [ref: para. 2.3. and 7.3.]	As necessary	Secretariat and WG Chairs and members	~~**IN PROGRESS**~~ **CLOSED** (ref: MET/IE WG work plan)
OPMET Monitoring				

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
07	**OPMET performance indices – States' follow-up:** Inform States concerned of the locations with low performance indices and advise the States to take appropriate corrective actions; address the above communication also the Regional OPMET Centres (ROCs) responsible for the collection of OPMET messages from the originating stations [ref: para. 3.4. and 3.5.]	Before MET SG/26	Secretariat	~~**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 1 and Activity 2~~ **CLOSED** Superseded by later activities
Regional Guidance Materials				
13	**ROBEX Handbook updates – Update process:** Propose options for a more streamlined process for updating the ROBEX Handbook data, such as through the development of a more dynamic, online repository for ROBEX data [ref: para. 4.4.]	Before MET SG/27	MET/IE WG	**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 6
14	**ROBEX Handbook updates – IWXXM-related data:** Investigate the development of an online repository for ROBEX data in which States would share and maintain up to date information on the IWXXM-capabilities of the ROBEX scheme and the AMHS addresses to support the required dissemination of IWXXM messages [ref: para. 4.6.]	Before MET SG/24	MET/IE WG	~~**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 6~~ **COMPLETED** IWXXM online register
15	**ROBEX Handbook updates – IWXXM-related flexibility:** Propose updates, as necessary, to reflect APAC States' requirement for flexibility of the ROBEX scheme structure during the transition to Region-wide implementation of IWXXM exchange [ref: para. 4.7.]	Before MET SG/27	MET/IE WG	**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 6
18	**ROBEX Handbook and SIGMET Guide updates – Legacy FASID information:** Prepare the consequential updates of the required information from the legacy FASID Tables relating to meteorology, apart from Table MET 1A, Table MET 1B and Table MET 3C, and the existing ICAO APAC regional guidance documentation, according to the proposal in WP/11 and the Draft Decision [ref: para. 4.16.]	Before MET SG/27	Secretariat and States	**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 6
19	**ANP and ROBEX Handbook updates – Vietnam NOC:** Coordinate on the implementation of the Vietnam NOC, including development of proposed updates to the APAC ANP and ROBEX Handbook [ref: para. 3.7.]	Before MET SG/27	Vietnam and Thailand	**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 6
20	**ANP and ROBEX Handbook updates – Indonesia new aerodromes:** Determine any requirement (based on IP/09) to update the ICAO APAC ANP and/or ROBEX Handbook [ref: para. 8.27.]	Before MET SG/27	Secretariat and Indonesia	**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 6
SIGMET test				
28	**SIGMET test results – corrective action plan:** Investigate the reason for the reduced reception of SIGMET test messages at Regional OPMET Centre (ROC) London compared to APAC RODB's and share the results with MET/S for potential corrective action [ref: para. 6.12.]	Before MET SG/26	MET/IE WG	~~**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 3 AND Ref: MET/S WG, 5. Work Plan, Activity 3~~ **CLOSED** Superseded by later activities
Other				
30	**VAAC backup test procedures – review and update:** Refer to the pertinent information from IP/08 and determine appropriate action for the next review and update of the VAAC backup test procedures [ref: para. 8.25.]	Before MET SG/26	MET/IE WG and MET/S WG	~~**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 4~~ **CLOSED** (ref: MET/S WG work plan)

Unresolved action items recorded by MET/IE WG/17

LIST OF ACTIONS (MET/IE WG)

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
17/1	Coordinate all necessary notifications concerning the planned handover of the provision of SIGMET service valid for Phnom Penh FIR from MWO Chengdu to MWO Phnom Penh, including the following: (a) changes to the routing of the SIGMET and advisory information at the responsible VAAC, TCAC and the RODBs; and (b) updates to the ANP, including the legacy FASID tables, and the Regional SIGMET Guide. *[Report of MET/IE WG/17, para. 3.1 – 3.4, refers]*	Before MET SG/27	Cambodia and Secretariat	**IN PROGRESS**
17/3	Coordinate all necessary notifications concerning the planned provision by China of OPMET information for the new Beijing Daxing International Airport, from 15 August 2019, including the following: (a) updates to the ROBEX Handbook and notification to States via "METNO"; and (b) updates to the ICAO Doc. 7910 and APAC ANP, including AOP and MET tables. *[Report of MET/IE WG/17, para. 3.6 – 3.8, refers]*	Before MET SG/27	China and Secretariat	**IN PROGRESS**
17/4	Coordinate a proposal to update the ROBEX Handbook to enable the regular exchange of several international OPMET bulletins to the ROBEX Centre Beijing and present it for further review and possible endorsement by MET/SG/23. *[Report of MET/IE WG/17, para. 3.9 – 3.12, refers]*	17 Jun 2019	Secretariat China	**COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)
17/10	Liaise with the SADIS Provider concerning obtaining OPMET availability statistics on SADIS for future meetings of the MET/IE WG. *[Report of MET/IE WG/17, para. 4.21, refers]*	Before MET SG/27	Secretariat	**IN PROGRESS**
17/11	Present a consolidated proposal for updates to the ROBEX Handbook, to reflect the establishment of an NOC (within the ROBEX scheme) in Vietnam, for further review and possible endorsement by MET/SG/23. *[Report of MET/IE WG/17, para. 5.9 – 5.10, refers]*	17 Jun 2019	Vietnam, Thailand and Secretariat	~~**IN PROGRESS**~~ **COMPLETED**
17/12	Propose any necessary updates to the ROBEX Handbook to reflect the actual requirements for OPMET information. *[Report of MET/IE WG/17, para. 5.11 – 5.13, refers]*	17 Jun 2019	States with low PIs for OPMET	**CLOSED** Superseded by later activities
17/16	Coordinate the requirements for all additional, new updates to the ROBEX Handbook and consolidate these into an update proposal for further review and possible adoption by MET/SG/23. *[Report of MET/IE WG/17, para. 6.5, refers]*	17 Jun 2019	Secretariat	**CLOSED** Superseded by later activities
17/20	Propose updates to all required APAC documentation regarding the originating address of Australian WV SIGMETs (i.e., YMMC, rather than AMMC). *[Report of conjoint session of MET/IE WG/17 and MET/S WG/9, para. 2.24, refers]*	Before MET SG/27	Secretariat and Australia	**IN PROGRESS** ANP Table MET II-1 pending update

Unresolved action items recorded by MET/IE WG/16

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
16/4	Review the usage of the request-reply service provided and, where appropriate, arrange for the routine provision of OPMET bulletins as an alternative to the usage of the request-reply service for routine access to the stored OPMET data [Report of MET/IE WG/16, para. 5.8, refers].	Mar 2019	APAC RODBs	**CLOSED** Superseded by later activities

Unresolved action items recorded by ROBEX WG/13

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
13/7	Investigate feasibility of including provisions in the regional guidance material related to the issuance of routine TAF at intervals of three (3) hours; present draft material to MET SG/21 [Ref: ROBEX WG/13 Decision 13/7].	Before MET SG/27	Secretariat and ROBEX WG	**IN PROGRESS** Coordinate necessary follow-up through the ICAO ANP working group [Ref: MET/IE WG/16 Report para. 2.9].

LIST OF ACTIONS (MET SG)

(Note: Proposed updates are indicated with ~~strikethrough~~ and highlighted text)

New action items recorded by MET SG/26

MET SG – LIST OF ACTIONS

Action No.	Detailed description of actions	Responsibility	Target date	Status
26/01	***MET Deficiencies template* and *guidance* documents:** Finalise and publish the *MET Deficiencies template* and *guidance* documents (from Appendix F of the Report of MET SG/25) as stand-alone documents on the ICAO APAC Office "eDocuments" webpage. [Ref: Report of MET SG/26, para. 2.4.]	Secretariat and ad hoc group on MET deficiencies	Nov 2022	**IN PROGRESS**
26/02	**Papers for MET/S WG on QMS:** Request papers for future meetings of the MET/S WG on issues concerning the implementation and monitoring the implementation of QMS in the Region. [Ref: Report of MET SG/26, para. 2.18.]	Secretariat and Chair of MET/S WG	Dec 2022	**IN PROGRESS**
26/03	**Paper for CNS SG/26 on Draft Decision SWIM TF/06/01:** Submit a paper to CNS SG/26 highlighting that the MET SG/26 noted the importance of CNS SG/26 adopting the proposal in Draft Decision SWIM TF/06/01. [Ref: Report of MET SG/26, para. 2.31.]	Secretariat	Aug 2022	**COMPLETED** CNS SG/26 – WP/34
26/04	**APANPIRG AN Deficiencies – requirements for WAFS forecasts:** Provide technical assistance to help the States concerned understand and determine the requirements for WAFS forecasts. [Ref: Report of MET SG/26, para. 3.2.]	Secretariat	Nov 2022	**IN PROGRESS**
26/05	**Location indicator for FIR Port Moresby in the SIGMET Guide:** Include the correct location indicator for FIR Port Moresby (as previously identified in Action No. 25/07) in the approved ICAO APAC Regional SIGMET Guide, Tenth Edition. [Ref: Report of MET SG/26, para. 4.5.]	Secretariat	Nov 2022	**IN PROGRESS**
26/06	**ROBEX Handbook amendments for the regular exchange of OPMET bulletins to ROC Beijing:** (a) Amend the ICAO APAC ROBEX Handbook as discussed in the Report of MET SG/26, para. 4.11.; (b) Assist China with consulting with India concerning India's agreement to regular exchange of OPMET bulletins to ROC Beijing; and (c) Subject to India's agreement, Amend the ROBEX Handbook as discussed in the Report of MET SG/26, para. 4.12. [Ref: Report of MET SG/26, para. 4.13.]	Secretariat	Nov 2022	**COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)
26/07	**APAC ANP, Volume III amendment – examples from other ICAO Regions:** Consider examples of Volume III adopted by other ICAO Regions in the MET work plan on a proposal for amendment of MET-specific material in the APAC ANP, Volume III. [Ref: Report of MET SG/26, para. 5.8.]	Secretariat and MET/R WG	Nov 2022	**TO COMMENCE**
26/08	**APAC ANP, Volume II amendment – Nepal:** Initiate an appropriate proposal for amendment of the ANP Volume II, to reflect the requirements for aerodrome meteorological offices in Nepal. [Ref: Report of MET SG/26, para. 5.9.]	Secretariat and Nepal	Nov 2022	**IN PROGRESS**
26/09	**Outdated WAFS Service Document:** Remove the WAFS Service Document, which dated back to 2012, from the ICAO APAC Office eDocuments webpage. [Ref: Report of MET SG/26, para. 8.3.]	Secretariat	Nov 2022	**COMPLETED** 16/09/2022

Unresolved action items recorded by MET SG/25

MET SG – LIST OF ACTIONS

Action No.	Detailed description of actions	Responsibility	Target date	Status
25/04	**Revise the Work Plan of MET/R** to take the lead in developing the proposed amendment to ANP Volume III in coordination with MET/IE and MET/S [Ref: para. 2.5.]	Secretariat and MET/R WG	Nov 2021	**TO COMMENCE**
25/05	**Reach out to States concerned with air navigation deficiencies** to identify and record target dates for resolving their respective air navigation deficiencies [Ref: para. 4.3.]	Secretariat	Nov 2021	**IN PROGRESS**
25/06	**Finalise the proposals for amendment of the APAC ANP (Vol I and II) and ROBEX Handbook** as agreed in previous meetings to ensure accuracy of the requirements specifications against which the OPMET monitoring is analysed [Ref: para. 4.6.-4.7.]	Secretariat	Nov 2021	**IN PROGRESS**
25/07	**Finalise a proposal for amendment of the APAC ANP (Table MET II-1) and consequential amendment to the APAC Regional SIGMET Guide** as necessary to ensure the correct use of FIR indicator for Port Moresby [Ref: para. 4.12.-4.14.]	Secretariat	Nov 2021	**IN PROGRESS** ANP amendment pending; SIGMET Guide amended, 9th Ed.
25/09	**Review SIGMET Guide** as necessary to guide MWOs to handle cases when VAAC would not hand over to the neighbouring VAAC even if the ash cloud is expected to cross the AoR [Ref: para. 4.12.-4.14.]	MET/S	Mar 2023	**TO COMMENCE**
25/10	**Assist the Solomon Islands in aligning procedures with ICAO Annex 3, conducting SIGMET monitoring by RODBs and follow-up SIGMET tests** to demonstrate ICAO-compliant content, format and timeliness of SIGMET information service and its sustainability [Ref: para. 4.15.-4.18.]	Solomon Islands, Secretariat, Australia and New Zealand	Feb 2022	**IN PROGRESS** Ref: MET/S WG/12 IP/11
25/11	**Coordinate removal of AN deficiency AP-MET-23 from the open list** with the relevant ICAO bodies (MET/S WG, MET SG and APANPIRG) after receipt of the additional evidence and report from Solomon Islands [Ref: para. 4.19.]	Secretariat	Mar 2022	**TO COMMENCE**
25/12	**Provide updates to the contact lists in the ICAO Doc 9766-AN/968 (Handbook on the International Airways Volcano Watch (IAVW))** to the ICAO METP [Ref: para. 5.15.]	MET SG, MET/S WG, MET/IE WG	Mar 2022	**TO COMMENCE**
25/13	**Coordinate possible SWX advisory exercise/s and training workshop/s** with the appropriate body under METP for [Ref: para. 5.28.]	Secretariat MET/S WG, MET/IE WG	Nov 2021	**IN PROGRESS** ICAO APAC webinar on space weather information service (TBD in Q3/Q4 2022); Secretariat to coordinate with Australia [MET/IE WG/20 - ACTION 01]; MET/R WG new deliverable #7 to promote user education on SWX service.
25/14	**Finalise the proposed amendment to the ROBEX Handbook, Table A, Appendix A,** to reflect the requirement of China for regular exchange of OPMET bulletins with Sri Lanka, Indonesia, Malaysia and India in consultation with States concerned [Ref: para. 6.1.-6.2.]	Secretariat	Nov 2021	~~**IN PROGRESS**~~ **COMPLETED** (subject to publication of updates in MET/IE WG/21, WP/10; ROBEX HB 15th Ed.)

– – – – – – – – – – – – – –

ICAO ASIA AND PACIFIC METEOROLOGICAL INFORMATION EXCHANGE WORKING GROUP (MET/IE WG)

TERMS OF REFERENCE AND WORK PLAN

(Note: Proposed updates are indicated with ~~strikethrough~~ and highlighted text)

TERMS OF REFERENCE

1. MEMBERSHIP
The MET/IE WG is made up of experts from the following bodies: • APAC Regional OPMET Data Banks (RODBs): Brisbane, Nadi, Tokyo, Singapore and Bangkok; • APAC Regional OPMET Centres (ROCs); • World Area Forecast Centres (WAFCs), London and Washington; • Secure Aviation Data Information Service (SADIS) and WAFS Internet File System (WIFS) Provider States, United Kingdom and United States; • APAC Volcanic Ash Advisory Centres (VAACs): Darwin, Tokyo and Wellington; • Designated focal points for SIGMET tests and regional OPMET bulletin exchange (ROBEX); • Pacific Islands Aviation Weather Services (PIAWS) Panel; and • International Air Transport Association (IATA).

State or Org./Name	Title/Organization	Contact information
AUSTRALIA (Chair) Mr. Tim HAILES (VAAC, ROBEX)	National Manager Aviation Service Development Australian Bureau of Meteorology, GPO 1289, Melbourne VIC 3001 AUSTRALIA	Tel: +61 3 9669 4273 Mob: +61 4 2784 0175 Email: tim.hailes@bom.gov.au
HONG KONG, CHINA (Vice Chair) Mr. KOK Mang-hin, Marco (ROBEX)	Acting Senior Scientific Officer, Hong Kong Observatory 134A Nathan Road, Kowloon, HONG KONG, CHINA	Tel: +852 2926 8437 Fax: +852 2375 2645 Email: mhkok@hko.gov.hk
AUSTRALIA Mr. Pierre KEMMERS (RODB, ROBEX)	AIS Business Manager Airservices Australia GPO Box 367 Canberra ACT 2601	Tel: +61 2 6268 4426 Mob: +61 416 509078 E: pierre.kemmers@airservicesaustralia.com (primary) / YBBBYPYX@airservicesaustralia.com (secondary)
~~**AUSTRALIA**~~ ~~Mr. Tristan King~~ ~~(VAAC, ROBEX)~~	~~Innovation Lead~~ ~~Australian Bureau of Meteorology,~~ ~~GPO 1289, Melbourne VIC 3001 AUSTRALIA~~	~~Tel: +61 3 9669 4146~~ ~~E: tristan.king@bom.gov.au~~
AUSTRALIA Mr. David House (ROBEX)	Operational Systems Specialist Australian Bureau of Meteorology, GPO Box 727, Hobart TAS 7001 AUSTRALIA	Tel: +61 3 6221 2058 | E: david.house@bom.gov.au
CHINA Ms. ZOU Juan (ROBEX)	Meteorologist, Meteorology Division, Air Traffic Management Bureau, Civil Aviation Administration of China, No. 12, East Sanhuan Road Middle, Chaoyang District, Beijing 100022 CHINA	Tel: 86-10-87786826 Fax: 86-18-87786820 Email: zoujuan@atmb.net.cn
FIJI Mr. William REECE (RODB, ROBEX)	Head of Support and Maintenance, Airports Fiji Limited, Private Mail Bag, Nadi Airport FIJI Islands	Tel: +679 673 1198 Mob: +679 990 6105 Email: williamr@fijiairports.com.fj
HONG KONG, CHINA Mr. Patrick LAM (ROBEX)	Senior Aeronautical Communications, Supervisor, Civil Aviation Department, Air Traffic Management Division, Telecommunications Unit, 3/F, 1 Tung Fai Road, Lantau, HONG KONG, CHINA	Tel: +852 2910 6211 Fax: +852 2910 1160 Email: hhlam@cad.gov.hk
~~**HONG KONG, CHINA**~~ ~~Mr. KOK Mang-hin, Marco~~ ~~(ROBEX)~~	~~Acting Senior Scientific Officer, Hong Kong Observatory~~ ~~134A Nathan Road, Kowloon,~~ ~~HONG KONG, CHINA~~	~~Tel: +852 2926 8441~~ ~~Fax: +852 2375 2645~~ ~~Email: mhkok@hko.gov.hk~~

State or Org./Name	Title/Organization	Contact information
JAPAN ~~Mr. Kentaro TSUBOI (To be updated)~~ Mr. OHNO Yoritsugi (RODB, SIGMET test)	~~Scientific Officer, Information and Communications Technology Division, Forecast Department, Japan Meteorological Agency (JMA), 1-3-4 Otemachi, Chiyoda-ku, Tokyo 100-8122, JAPAN~~ Senior Scientific Officer, Information and Communications Technology Division, Information Infrastructure Department, Japan Meteorological Agency (JMA) 3-6-9 Toranomon, Minato City, Tokyo 105-8431, JAPAN	~~Tel: +81 3 3212 8341 (ext. 3283)~~ ~~Fax: +81 3 3211 8404~~ ~~Email: k-tsuboi@met.kishou.go.jp~~ Tel: +81 3 6758 3900 Email: yoritsugi.oono-a@met.kishou.go.jp
JAPAN ~~Mr. Kazuya Kawaguchi (To be updated)~~ Mr. OKAWARA Nariaki (VAAC)	~~Senior Scientific Officer, Volcanology Division, Seismology and Volcanology Department, Japan Meteorological Agency (JMA), 1-3-4 Otemachi, Chiyoda-ku Tokyo 1008122, JAPAN~~ Senior Coordinator for International Volcanic Ash Information, Volcanic Observation Division, Seismology and Volcanology Department, Japan Meteorological Agency (JMA) / Volcanic Ash Advisories Center (VAAC) Tokyo 3-6-9 Toranomon, Minato City, Tokyo 105-8431, JAPAN	~~Tel: +81 3 3284 1749~~ ~~Fax: +81 3 3212 3648~~ ~~Email:~~ ~~kazuya_kawaguchi@met.kishou.go.jp~~ Tel: +81 3 6758 3900 Email: n-okawara@met.kishou.go.jp
MALAYSIA Mr. Jailan bin Simon (ROBEX)	Senior Director, National Aviation Meteorological Centre, Kuala Lumpur International Airport, 1st Floor, Airport Management Centre, 64000 Sepang, Selangor Darul Ehsan, MALAYSIA	Tel. : +603-8787 2360 Fax : +603-87871019 Email : jailan@met.gov.my
NEW ZEALAND Ms Paula ACETHORP (VAAC, ROBEX, PIAWS Panel)	Chief Meteorological Officer, Civil Aviation Authority of New Zealand, PO Box 3555, Wellington NEW ZEALAND	Email: paula.acethorp@caa.govt.nz
REPUBLIC OF KOREA Ms. Insul SONG (To be updated) (ROBEX)	Assistant Director, Aviation Meteorological Office (AMO) of Korea Meteorological Administration (KMA), PO box 43, 272 Gonghang-ro, Jung-gu, Incheon, 22382 REPUBLIC OF KOREA	Tel: +82 (32) 740 2840 Fax: +82 (32) 740 2487 E-mail: songis2015@korea.kr
REPUBLIC OF KOREA Mr. Young-Lock KIM (To be updated) (ROBEX)	Assistant Director, Aviation Meteorological Office (AMO) of Korea Meteorological Administration (KMA) PO box 43, 272 Gonghang-ro, Jung-gu, Incheon, 22382 REPUBLIC OF KOREA	Tel: +82 (32) 740 2840 Fax: +82 (32) 740 2487 E-mail: kyl99@korea.kr
SINGAPORE ~~Mr. Wong Songhan~~ Mr. **Chiam** Keng Oon **(**RODB, SIGMET test, ROBEX)	Senior Meteorologist, Meteorological Services Singapore, P.O. Box 8, Singapore Changi Airport ~~Post Office~~, Singapore 918141 SINGAPORE	Tel: +65 ~~6546 2934~~ 6244 6133 Fax: +65 6542 5026 Email: ~~wong_songhan@nea.gov.sg~~ chiam_keng_oon@nea.gov.sg
SINGAPORE Mr. **Goh** Wee Poh **(**RODB, SIGMET test, ROBEX)	~~Senior Meteorologist~~ Head, Customer Services, Meteorological Service Singapore, P.O. Box 8, Singapore Changi Airport, Singapore 918141 SINGAPORE	Tel: +65 6542 9224 Fax: +65 6542 5026 Email: goh_wee_poh@nea.gov.sg
THAILAND ~~Ms. Sujin PROMDUANG~~ Mr. Bunpot Kujaphun (RODB, ROBEX)	Director, Aeronautical Information and Flight Data Management Centre, Aeronautical Radio of Thailand Ltd., 102 Ngamduplee, Sathorn, Bangkok 10120, THAILAND	Tel: +66 (2) 285 9083 Fax: +66 (2) ~~287 3131~~ 2878538 Email: ~~sujin.pr@aerothai.co.th~~ bunpot.ku@aerothai.co.th
TONGA Mr. 'Ofa F'ANUNU (PIAWS Panel)	Director of Meteorology, Tonga Meteorological Service, Fuaamotu Airport TONGA	Tel: +676 877 7750 Fax: +676 35123 E-mail: ofaf@met.gov.to
UNITED KINGDOM Ms. Karen Shorey (WAFC, SADIS)	International Aviation and SADIS Manager Met Office, FitzRoy Road, Exeter, EX1 3PB UNITED KINGDOM	Tel: Fax: Email: karen.shorey@metoffice.gov.uk
UNITED STATES Mr. Pat MURPHY (To be updated) (WAFC, WIFS)	Federal Aviation Administration, Senior Meteorologist, Programme Lead International, FAA Headquarters, 800 Independence Ave, S.W., Washington, D.C. 20591 UNITED STATES	Tel: +1 (202) 267 2788 Email: michael.murphy@faa.gov
IATA (TBC)	(TBC)	Tel: Fax: Email:

TERMS OF REFERENCE AND WORK PLAN

State or Org./Name	Title/Organization	Contact information
ICAO (Secretariat) Mr. Peter DUNDA	Regional Officer Aeronautical Meteorology/Environment International Civil Aviation Organization 252/1, Vibhavadi Rangsit Road, Ladyao, Chatuchak, Bangkok 10900 THAILAND	Tel: +66 (2) 537-8189 Ext. 153 Fax: +66 (2) 537-8199 Email: PDunda@icao.int

2. DESCRIPTION	
Objective	Increase OPMET availability and reliability needed for flight planning (efficiency) and in-flight re-planning (safety) in support of the Global Air Navigation Plan (GANP) framework and the Aviation System Block Upgrade (ASBUs) methodology.
Benefits	Increase in safety and efficiency (time and fuel savings).
Functions of the group	Under guidance from the ICAO APAC Secretariat: a) Review the OPMET exchange schemes in the APAC and other regions and develop proposals for their optimization, taking into account the requirements by the aviation users and global OPMET exchange; b) Review and update of the procedures for inter-regional OPMET exchange and ensure the availability of the required APAC OPMET data for SADIS and WIFS; c) ~~Report on deficiencies in~~Monitoring the format and dissemination of OPMET messages; d) Monitor and participate in inter- and intra-regional trials of aeronautical meteorological information exchange in support of the implementation of IWXXM and SWIM; e) Conduct trials and develop standardized quality control, monitoring and management procedures related to exchange of IWXXM and TAC OPMET information; f) Participate in the implementation and promote awareness of the transition to digital exchange of OPMET (IWXXM) and System Wide Information Management (SWIM); g) Conduct regular regional VAAC back-up and SIGMET tests; h) Provide support for the APAC ~~Volcanic Ash~~MET Exercises; i) Review and update the regional guidance material related to OPMET exchange, including relevant material on IWXXM, AMHS and SWIM; j) Liaise and consult with other appropriate bodies within ICAO and WMO dealing with communication and/or management aspects of the OPMET exchange; ~~and~~ k) Coordinate and seek support from other enabling ICAO groups (e.g. SWIM TF, ACSICG, CRV OG, etc.) to support MET information exchange initiatives; and l) Provide advice and report to the MET Sub-group on the above issues for further co-ordination through the ICAO Secretariat with other appropriate bodies.

3. COMMUNICATION STRATEGIES

Description	Target Audience	Delivery Method	Frequency / Date	Responsibility
Annual working group meeting	All APAC States	In person	Annual / March	Chair and Secretariat
Interim Work Program Progress Report	MET/IE WG Members	Web-conference E-mail	Quarterly/as determined by Chair	Chair(s) and Secretariat
MET Chairs Coordination Meeting	Chairs of MET SG and its contributory working groups	Web-conference E-mail	Quarterly/as determined by MET SG Chairs~~reflect the requirement for an annual (quarterly) schedule of c~~	Chair and Secretariat
Major Work Program Progress Report	MET/IE WG Members	Working Paper (MET/IE WG meeting)	Annually/published 14-days or more before the meeting	Chair and Secretariat
General correspondence	MET/IE WG Members	E-mail	As required	MET/IE WG Members
New, specific proposal for action (WP)	MET/IE WG Meeting	Working Paper (MET/IE WG meeting)	Annually/submitted 28-days or more before the meeting (published 14-days or more before the meeting)	MET/IE WG Members or States
New, specific information (IP)	MET/IE WG Meeting	Information Paper (MET/IE WG meeting)	Annually/submitted 28-days or more before the meeting (published 14-days or more before the meeting)	MET/IE WG Members or States
Working Group Meeting Report	MET/IE WG Members and all APAC States	MET/IE WG Meeting Report	Annually/published 21-days or less after the meeting	Chair and Secretariat
Working Group Progress Report	MET SG Meeting	Working Paper (MET SG meeting)	Annually/submitted 28-days or more ~~before the meeting~~	Chair and Secretariat

			~~(published 14 days or more before the meeting)~~	

WORK PROGRAM

Activity	Time Frame	Responsibility	Status
~~Activity 1: Availability of OPMET information~~	~~Ongoing~~	~~MET/IE WG~~	
Activity 2: Timeliness, compliance and regularity of OPMET exchange	Ongoing	MET/IE WG	
Activity 3: SIGMET and Advisory Tests	Ongoing	MET/IE WG	
Activity 4: VAAC Backup Tests	Ongoing	MET/IE WG	
Activity 5: IROG Backup Tests	Ongoing		
Activity 6: Regional guidance material related to data exchange	Ongoing	MET/IE WG	
Activity 7: IWXXM implementation	~~2021~~2023-~~2023~~2026	MET/IE WG	
Activity 8: MET information exchange scheme	Ongoing~~2021-2026~~	MET/IE WG	
Activity 9: MET information in SWIM	Ongoing~~2021-2026~~		

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
~~Activity 1: Availability of OPMET information~~				
~~Activity 1.1: Perform real time monitoring if required~~	~~IATA~~	~~-~~	~~If required~~	
~~Activity 1.2: Monitor and score SADIS/WIFS OPMET reception.~~	~~IATA~~	~~-~~	~~Annually Jan~~	
~~Activity 1.3: Capture OPMET monitoring,~~	~~RODBs~~	~~1.2~~	~~Annually Oct/Nov~~	
~~Activity 1.4: Assess TAC OPMET monitoring results and share results with RODBs~~	~~RODB Bangkok~~	~~1.3~~	~~Annually Oct/Nov~~	
~~Activity 1.6: Prepare paper reporting results and deficiencies to MET/IE WG meeting.~~	~~IATA and RODB Bangkok~~	~~1.4~~	~~Annually Feb~~	
~~Activity 1.7: Report summary of OPMET availability results to MET SG~~	~~Secretariat and Chair~~	~~1.5~~	~~Annually May~~	
~~Activity 1.8: Advise States of OPMET deficiencies and corrective actions.~~	~~Secretariat~~	~~1.6~~	~~Annually Jun~~	
~~Activity 1.9: Actively engage States with corrective against deficiencies.~~	~~ROCs~~	~~1.7~~	~~As required~~	
~~**Milestone 1:** Achieve 95% (90%) or greater OPMET availability for AOP (non-AOP) aerodromes at RODBs and WAFS.~~	~~MET/IE WG~~	~~1.8~~	~~Annually Jun~~	
Activity 2: Performance indices of OPMET exchange ~~Timeliness, compliance and regularity of OPMET exchange~~				
Activity 2.1: Monitor and collate OPMET data.	RODBs ~~and IATA~~	-	Annually Dec	
Activity 2.2: Score RODB OPMET reception against PI thresholds.	RODB Bangkok	-	Annually Jan	
Activity 2.3: Analyse data and share results with RODBs	RODB Bangkok	2.2	Annually Jan	

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
Activity 2.4: Prepare paper report results to MET/IE WG meeting and identify corrective actions	RODB Bangkok	2.3	Annually Feb	
Activity 2.5: Report summary of OPMET ~~timeliness~~availability, compliance and regularity results to METSG	Chair	2.4	Annually ~~May~~before MET SG	
Activity 2.6: Inform States of non-compliance and corrective actions.	Secretariat	2.5	Annually Jun	
Activity 2.7: Provide support for States to ~~rectify deficiencies~~ support corrective actions if requested.	RODBs	2.6	As required	
Milestone 2: Achieve 95% (90%) or greater OPMET ~~timeliness~~availability, compliance and regularity for AOP (non-AOP) aerodromes at RODBs, SADIS and WIFS.	MET/IE WG	2.7	Annually Jun	
Activity 3: SIGMET and Advisory Tests				
Activity 3.1: Review SIGMET Test procedures	MET/IE WG	-	Annually Aug	
Activity 3.2: State Letter regarding SIGMET Tests	Secretariat	3.1	Annually Sep	
Activity 3.3: Email States regarding SIGMET Tests	Secretariat	3.2	Annually	Last Wed in Oct
Activity 3.4: Conduct and collate data for WC SIGMET Tests	RODBs	3.2	Annually	2nd Wed in Nov
Activity 3.5: Conduct and collate data for WV SIGMET Tests	RODBs	3.2	Annually	3rd Wed in Nov
Activity 3.6: Conduct and collate data for WS SIGMET Tests	RODBs	3.2	Annually	4th Wed in Nov
Activity 3.7: Analyse test data	RODB Singapore and Tokyo	3.4 - 3.6	Annually Jan	
~~Activity 3.8: Assess SIGMET test results to identify corrective actions from Nov tests~~	~~RODB Singapore and Tokyo~~	~~3.4 - 3.6~~	~~Annually Feb~~	
Activity 3.9: Report to MET/IE WG	RODB Singapore and Tokyo	3.8	Annually Mar	
Activity 3.10: Report on SIGMET Test Results to MET SG.	Chair	3.9	Annually May	
Activity 3.11: Advise States of SIGMET ~~deficiencies~~corrective actions	Secretariat	3.9	Annually Jun	
Milestone 3: Improved issuance and compliance of SIGMETs	MET/IE WG	3.11	Annually Jun	
Activity 4: VAAC Back-up Tests				
~~Activity 4.1: Review and Update VAAC Back-up Test procedures~~	~~MET/IE WG and VAACs~~		~~Annually~~	~~2 months prior to test~~
~~Activity 4.2: Issue Notice of VAAC Back-up Tests~~	~~Secretariat/VAACs~~	~~4.1~~	~~Annually Aug~~	
~~Activity 4.3: Conduct VAAC Back-up Test between Darwin and Tokyo~~	~~VAACs~~	~~4.2~~	~~Annually Oct – TBC~~	
~~Activity 4.4: Conduct VAAC Back-up Test between Darwin and Wellington~~	~~VAACs~~	~~4.2~~	~~Annually Oct – TBC~~	

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
Activity 4.5: Collect test results and send to VAAC Provider State members	RODBs	4.3	Annually Oct – TBC	
~~Activity 4.6: Analyse Test results~~	~~VAAC Back-up Focal Points Members~~	~~4.5~~	~~Annually Nov~~	
~~Activity 4.7: Report to MET/IE WG~~	~~VAAC Back-up Focal Points Members~~	~~4.6~~	~~Annually Feb~~	
~~Activity 4.8: Report to MET SG.~~	~~Chair~~	~~4.7~~	~~Annually May~~	
~~Activity 4.9: Advise relevant States, VAACs and RODBs of any deficiencies.~~	~~Secretariat~~	~~4.7~~	~~Annually Jun~~	
Milestone 4: VAAC Back-up Tests conducted ~~analysed and report complete~~.	VAAC Back-up Focal Points Members	4.8	Annually Jun	
Activity 5: IROG Back-up Tests				
Activity 5.1: Investigate the feasibility and benefits of back-up arrangements of IROG Tokyo, Nadi and Brisbane	IROG Nadi, Tokyo and Brisbane	-	Nov ~~2021~~2023	
Activity 5.2: Review IROG Back-up Test procedures to include all IROG.	IROG Bangkok and Singapore	-	Apr ~~2019~~2023, Annually Feb	
Activity 5.3: Updated IROG Back-up Procedures in ROBEX Handbook.	Secretariat	5.2	Annually May	
Activity 5.4: Identify list of MET Bulletins to monitor.	IROG Bangkok and Singapore	-	Annually Jan/Feb	
Activity 5.5: Conduct IROG Back-up Test of Bangkok and analyse results	IROG Bangkok and Singapore	5.4	Annually Sept/Oct	
Activity 5.6: Conduct IROG Back-up Test of Singapore and analyse results	IROG Bangkok and Singapore	5.4	Annually Jan/Feb	
Activity 5.8: Report to MET/IE WG	IROG Bangkok and Singapore	5.7	Annually Mar	
Milestone 5: IROG Back-up Tests conducted, analysed and report complete.	IROG Bangkok and Singapore	5.7	Annually Mar	
Activity 6: Regional guidance material related to data exchange				
Activity 6.1: Review OPMET exchange definitions as defined~~monitoring procedure~~ in ROBEX Handbook and update as necessary.	All RODBs	-	Annually Apr	
Activity 6.2: ~~Changes to RODB monitoring procedures and~~ Implement updates to Appendix A and B in ROBEX Handbook.	Secretariat	6.1	Annually May	
Activity 6.3: Document roles for monitoring IWXXM performance in APAC	~~WG~~Thailand and Secretariat		Nov ~~2021~~2023	
Activity 6.4: ~~Define~~ Propose quality threshold for translated data following consultation with users	~~IATA, Chair~~ WG		Nov ~~2021~~2023	
~~Activity 6.5: Advise Secretariat of changes to ROBEX Handbook.~~	~~All States~~	~~-~~	~~Annually Apr~~	
Activity 6.6: Complete update of ROBEX Handbook including Table MET 2A.	Secretariat	-	Annually May	

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
Activity 6.7: Review ANP Tables (initially MET II-2) and ensure all necessary aerodromes are contained in OPMET bulletins	WG	-	May Annually	
Activity 6.8: Seek MET/SG endorsement of the updated ROBEX Handbook.	Secretariat	-	Annually Jun	
Activity 6.9. Support MET SG with development of MET-specific requirements in the ANP, Volume III	WG		As required	
Milestone 6: ~~RODB Monitoring procedures published in~~ ROBEX Handbook remains relevant	Secretariat	6.7	Annually Sep	
Activity 7: IWXXM Implementation				
Activity 7.1: Monitor migration to IWXXM.	WG	-	As required	
~~Activity 7.2: Conduct survey to determine status of IWXXM Implementation.~~	~~Secretariat~~		~~May 2021~~	
Activity 7.3: Report to MET SG on APAC States' IWXXM implementation status~~. and need/timing for another APAC IWXXM Workshop~~.	Secretariat/Chair, WG	~~7.2~~	Next meeting MET SG	
Activity 7.4: Increase awareness of the requirement for States to exchange of OPMET data in IWXXM format and the impact of inability to do so.	WG		As required	
Activity 7.5: Support States with the planning and implementation of the dissemination of the required meteorological information in IWXXM form, in particular at the designated APAC Regional OPMET Centres (ROCs) and Regional OPMET Databanks (RODBs).	WG		As required	
~~Activity 7.6: Conduct IWXXM tests and report to MET/IE WG and RODB Singapore on the status of the testing and implementation of digital OPMET exchange.~~	~~WG~~		~~Annually Mar~~	
~~Activity 7.7: Maintain a register of IWXXM tests conducted, detailing Met software, UAs and MTAs tested~~	~~RODB Singapore~~	~~7.5~~	~~As required~~	
~~Activity 7.8: Arrange provision for the next IWXXM Workshop in APAC~~	~~Secretariat/Chair, WG~~	~~7.2~~	~~Sep 2021~~	
~~Activity 7.9: Actively participate in the next APAC IWXXM Workshop~~	~~Secretariat/Chair, WG~~	~~7.7~~	~~Oct 2021~~	
Activity 7.10: Prepare information (e.g. issues, CONOPS) for MET/P WG-MIE (possible MET/IE agenda items on issues on IWXXM and information service provision)	WG		As required	
~~Activity 7.11: Development and Publishing AMHS/FTBP network map~~	~~Pierre, Secretariat~~		~~Monthly~~	
Activity 7.12: ~~State~~ Maintain IWXXM online ~~status~~ register	Australia, Hong Kong, China and Secretariat		Monthly	
Milestone 7: Report to MET/IE WG and MET SG on IWXXM exchange and testing.	Secretariat and Chair	7.5, 7.6 and 7.8	Annually May	
Activity 8: MET Information Exchange Structure				
Activity 8.1: Review ROBEX Scheme diagram.	All RODBs, Secretariat		May Annually	

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
Activity 8.2: Review the structure of the ROBEX exchange in light of the introduction of SWIM.	WG		Annually Feb	
Activity 8.3: Review use of the Request/Reply service	RODBs	-	May ~~2021~~2023	
Activity 8.4: Improve the efficiency of Request/Reply service	RODBs	8.3	Sep ~~2021~~2023	
Milestone 8: Improved efficiency and effectiveness of ROBEX Scheme	MET/IE WG	-	~~2021~~2023	
Activity 9: MET information in SWIM				
Activity 9.1: Assist in the definition of the APAC SWIM Met service catalogue	WG	-	As required	
Activity 9.2: Assist in the definition of the APAC SWIM Met data catalogue	WG	-	As required	
Activity 9.3: Develop guidance to support States' implementation of MET information services	WG	-	As required	
Milestone 9: ~~Participated in the development of SWIM Meteorological~~MET-SWIM services implemented in ~~for~~ APAC	MET/IE WG	-	2023-2027	

– – – – – – – – – – – – –

List of Participants

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
1.	**AUSTRALIA (3)**			
	1.	Mr. David House	Operational Systems Specialist Australian Bureau of Meteorology	david.house@bom.gov.au;
	2.	Mr. Pierre Kemmers	AIS Business Manager Air Services Australia	pierre.kemmers@airservicesaustralia.com;
	3.	Mr. Tim Hailes	National Manager - Transport Customer Engagement Australian Bureau of Meteorology	tim.hailes@bom.gov.au;
2.	**BHUTAN (1)**			
	4.	Ms. Ugyen Lhamo	Meteorology/Hydrology Officer National Centre for Hydrology and Meteorology	ulhamo@nchm.gov.bt;
3.	**BRUNEI DARUSSALAM (2)**			
	5.	Mr. Hassanul Kamal Haji Adam	Meteorological Officer Brunei Darussalam Meteorological Department	hassanul.adam@met.gov.bn;
	6.	Mr. Shahalmie Emran	Meteorological Coordinator and Technical Officer Brunei Darussalam Meteorological Department	shahalmie.embran@met.gov.bn;
4.	**CAMBODIA (2)**			
	7.	Mr. Heang Vandy	Aeronautical Services Department State Secretariat of Civil Aviation – Cambodia	heangvandy@ssca.gov.kh;
	8.	Mr. Sivarak Chutipong	Director of Technical Development Cambodia Air Traffic Services	sivarakc@cats.com.kh;
5.	**HONG KONG, CHINA (3)**			

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
	9.	Mr. Heung Hoo Patrick Lam	Senior Aeronautical Communications Supervisor Hong Kong Civil Aviation Department	hhlam@cad.gov.hk;
	10.	Mr. Marco Mang-Hin Kok	Acting Senior Scientific Officer Hong Kong Observatory	mhkok@hko.gov.hk;
	11.	Ms. Agnes Ka	Aeronautical Communications Supervisor Civil Aviation Department, Hong Kong China	ywka@cad.gov.hk;
6.		**FIJI (2)**		
	12.	Mr. Makiti Raratabu	Air Navigation Services Inspector - ATM/Met CAA Fiji	makiti.raratabu@caaf.org.fj;
	13.	Mr. William Reece	Manager - Air Navigation Engineering Services Fiji Airports	williamr@fijiairports.com.fj;
7.		**INDIA (2)**		
	14.	Mr. Anil Deva	Joint General Manager (Air Traffic Management) Airports Authority of India	anild@aai.aero;
	15.	Mr. Gajendra Kumar	Scientist F India Meteorological Department	gajendra71.kumar@imd.gov.in;
8.		**INDONESIA (4)**		
	16.	Mr. Iqbal Maududi	Air Navigation Inspector DGCA Indonesia	iqbal.maududi8909@gmail.com;
	17.	Mr. Mufti Kamil	Dissemination Information for Aviation Meteorology BMKG Indonesia	mufti.kamil@bmkg.go.id;

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
	18.	Mr. Rajasain Edralin	Weather Forecaster Indonesian Agency for Meteorology, Climatology and Geophysics	sainsr2f@gmail.com;
	19.	Mr. Rydnovelles -	Air Navigation Inspector DGCA Indonesia	rydnov@yahoo.co.id;
9.	**JAPAN (2)**			
	20.	Mr. Kentaro Tsuboi	Scientific Officer Japan Meteorological Agency	k-tsuboi@met.kishou.go.jp;
	21.	Ms. Erika Hayami	Senior Coordinator for International Aeronautical Meteorology Japan Meteorological Agency	e-hayami@met.kishou.go.jp;
10.	**NEW ZEALAND (1)**			
	22.	Ms. Paula Acethorp	Chief Meteorological Officer Civil Aviation Authority of New Zealand	paula.acethorp@caa.govt.nz;
11.	**PAKISTAN (1)**			
	23.	Mr. Zulfiqar Alam	Joint Director (ATM AANS) Civil Aviation Authority of Pakistan	Zulfiqar.Alam@caapakistan.com.pk; aviatorphy@gmail.com;
12.		**PHILIPPINES (2)**		
	24.	Mr. Jose V Festejo. Jr	Aviation Services Safety Inspector Civil Aviation Authority of The Philippines	jadper_fr@yahoo.com;
	25.	Ms. Hannagrace Cristi	Assistant Weather Services Chief Philippines Atmospheric, Geophysical and Astronomical Services Administration Civil Aviation Authority of the Philippines	hannagrace.cristi@pagasa.dost.gov.ph; hannacristi@yahoo.com;
13.	**REPUBLIC OF KOREA (2)**			

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
	26.	Ms. Hansol Lee	Assistant Director Korea Meteorological Administration	dlgkth@naver.com;
	27.	Ms. Mijeong Shim	Assistant Director Aviation Meteorological, Office of Korea Meteorological Administration	mjshim@korea.kr;
14.	**SINGAPORE (3)**			
	28.	Mr. Goh Wee Poh	Head, Customer Services Branch Forecast Operations Department Meteorological Service Singapore	goh_wee_poh@nea.gov.sg;
	29.	Mr. Keng Oon Chiam	Senior Meteorologist National Environment Agency	chiam_keng_oon@nea.gov.sg;
	30.	Mr. Yi Wei Yeoh	Senior Manager (CNS/MET Regulation) Civil Aviation Authority of Singapore (CAAS)	yeoh_yi_wei@caas.gov.sg;
15.	**THAILAND (20)**			
	31.	Mr. Anusit Deepradit	Officer The Civil Aviation Authority of Thailand	anusit.d@caat.or.th;
	32.	Mr. Boonchai Tepyose	Computer Technical Officer Thai Meteorological Department	nattyengalt@gmail.com;
	33.	Mr. Somchai Yimsricharoenkit	Meteorological Specialist Civil Aviation Authority of Thailand	somchai.y@caat.or.th;
	34.	Mr. Wanchalearm Petsuwan	Computer Technical Officer Thai Meteorological Department	wpetsuwan@hotmail.com;

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
	35.	Mr. Warapong Noothong	Meteorologist Thai Meteorological Department	pui-74@hotmail.com;
	36.	Ms. Paweena Panikodom	Meteorologist Thai Meteorological Department	pavna55@hotmail.com;
	37.	Ms. Rassmee Damrongkietwattana	Director of Aeronautical Weather Monitoring Sub-Division Thai Meteorological Department	rassmee@hotmail.com;
	38.	Ms. Vanatta Noipan	Senior Officer The Civil Aviation Authority of Thailand	vanatta.n@caat.or.th;
	39.	Ms. Wattana Singtuy	Director of Southeast Asia Meteorological Telecommunication Center Thai Meteorological Department	wattana_123@yahoo.co.th;
	40.	Mr. Bunpot Kujaphun	Acting Director, Aeronautical Information and Flight Data Management Centre Aeronautical Radio of Thailand	bunpot.ku@aerothai.co.th;
	41.	Mr. Prinya Viyasilpa	Air Traffic Engineering Manager Aeronautical Radio of Thailand	prinya.vi@aerothai.co.th;
	42.	Mr. Worapong Jirojkul	Senior Air Traffic Systems Engineer Aeronautical Radio of Thailand	worapong.ji@aerothai.co.th;
	43.	Miss Narissara Na Rangsri	Aeronautical Information Assistant Manager Aeronautical Radio of Thailand	narissara.na@aerothai.co.th;

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
	44.	Mr. Auttaphud Suebnuang	Executive Air Traffic Systems Aeronautical Radio of Thailand	auttaphud.se@aerothai.co.th;
	45.	Mr. Pongpob Mongkolpiyathana	Executive Air Traffic Systems Engineer Aeronautical Radio of Thailand	pongpob.mo@aerothai.co.th;
	46.	Mr. Putchaphan Sirisap	Director of Aeronautical Meteorology, Research and Development Sub-division Thai Meteorological Department	siri_putch@hotmail.com;
	47.	Mr. Suttipong Kornrapat	Air Traffic Systems Engineer Aeronautical Radio of Thailand	suttipong.kr@aerothai.co.th;
	48.	Mr. Wanchai Rattanasing	Aeronautical Information Manager Aeronautical Radio of Thailand	wanchai.ra@aerothai.co.th;
	49.	Mr. Chaiwat Saekhew	Air Navigation Operations Planning Division Officer Civil Aviation Authority of Thailand	chaiwat.s@caat.or.th;
	50.	Mr. Napatra Chuepan	Officer Civil Aviation Authority of Thailand	napatra.c@caat.or.th;
16.	**VIET NAM (4)**			
	51.	Mr. Hung Phan Ba	Deputy Director of AMC Aviation Meteorological Centre (AMC)- VATM	hungphb@yahoo.com;
	52.	Ms. Vu Thi Thanh Tam	MET Official Vietnam Air Traffic Cooperation	vuthithanhtam86@gmail.com;
	53.	Ms. Nguyen Lan Oanh	Deputy Director of Air Navigation Department (AND) Civil Aviation Authority of Vietnam (CAAV)	lanoanh@caa.gov.vn;

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
	54.	Mr. Le Quoc Khanh	Deputy General Director Vietnam Air Traffic Management Corporation (VATM)	lequockhanh@vatm.vn;
17.		**ICAO (2)**		
	55.	Mr. Peter Dunda	Regional Officer MET International Civil Aviation Organization Asia and Pacific Office	pdunda@icao.int;
	56.	Ms. Varapan Meefuengsart	Program Assistant International Civil Aviation Organization Asia and Pacific Office	vmeefuengsart@icao.int;

LIST OF WORKING AND INFORMATION PAPERS

WORKING PAPERS			
Agenda Item	**WP No.**	**Title**	**Presented by**
1	WP/01	Provisional Agenda	Secretariat
2	WP/02	Follow-Up Action from MET/IE WG/20	Secretariat
2	WP/03	Follow-Up Action from MET SG/26	Secretariat
2	WP/04	Follow-Up Action from APANPIRG/33	Secretariat
5	WP/05	Australia TAF Extensions and Filenames for Individual IWXXM TAFS	Australia
4	WP/06	Latest Global Development of IWXXM and Planned Releases	Hong Kong, China
6	WP/07	Updates to IWXXM FAQs - Lesson Learnt and Common Issues	Hong Kong, China and New Zealand
6	WP/08	Improving AFTN/AMHS Access for Meteorological Originating Stations	Australia
7	WP/09	Asia/Pac Inter-Regional OPMET Gateway Backup Exercise between IROG Singapore and IROG Bangkok	Singapore
6	WP/10	ROBEX Handbook Updates	Secretariat
6	WP/11	Updates To ROBEX Handbook	China
6	WP/12	Update of Aerodrome Forecast Issuance and Validity (30TAF3)	New Zealand
6	WP/13	Updates To Asia Pacific ROBEX Handbook	Hong Kong, China
4	WP/14	Update on online Register of APAC IWXXM Exchange Status	Australia and Hong Kong, China
7	WP/15	Review MET/IE WG Work Program and Terms of Reference	Secretariat
8	WP/16	Proposals for the Amendment of ICAO Annex 3	Secretariat
5	WP/17	Asia/Pacific Performance Indices	Thailand
5	WP/18	Asia/Pac Inter-Regional OPMET Gateway Backup Exercise Between IROG Bangkok and IROG Singapore	Thailand
6	WP/19	Updates to ROBEX Handbook	Thailand
Conjoint session of MET/IE SG/21 and MET/S WG/13			
C2	WP/C01	Review of SIGMET Test 2022	Singapore

WORKING PAPERS			
Agenda Item	**WP No.**	**Title**	**Presented by**
C2	WP/C02	Results of SIGMET Tests 2022 - TC and VA	Japan

INFORMATION PAPERS			
Agenda Item	**IP No.**	**Title**	**Presented by**
1	IP/01	MEETING BULLETIN	Secretariat
3	IP/02	Updates on the Implementation of IWXXM in Indonesia	Indonesia
4	IP/03	Updates on the Implementation of IWXXM in China	China
4	IP/04	Update on IWXXM Implementation in Hong Kong, China	Hong Kong, China
5	IP/05	Trouble at RODB Brisbane in Receiving METAR Data with Heading SAID32 and SAID 33	Indonesia
4	IP/06	Status and Plans for Implementation of IWXXM in Thailand	Thailand
5	IP/07	Implementation of IWXXM Specific Statistics	Thailand
4	IP/08	Status and Plans for Implementation of IWXXM in Cambodia	Cambodia
4	IP/09	Update on IWXXM Implementation in Singapore	Singapore

FLIMSY			
Agenda Item	**Flimsy No.**	**Title**	**Presented by**
6	Flimsy/01	METNO Guidance in ROBEX Handbook	Hong Kong, China and Australia

– – – – – – – – – – – – –

LIST OF PROPOSED UPDATES OF THE APAC ROBEX HANDBOOK, 15TH EDITION, MARCH 2023
(As agreed by MET/IE WG/21)

SECTION	REFERENCES	UPDATES
11. REGIONAL OPMET DATA BANKS (RODB)	MET/IE WG/19, Action item 19/02	**Add** footnote 1 to para. 11.1.
13.3 OPMET Monitoring	MET/IE WG/21 Report, para 6.3; Action item MET/IE WG/21-09	**Correct** the references to IWXXM TAF bulletins from "LC" to "LT" in para. 13.3.1.1
APPENDIX A/TABLE A - Collection and Dissemination of METAR (SA) Bulletins	MET SG/25, Action item 25/14; MET SG/26, Action item 26/06	**Add** (RODB/ROC) Beijing, (AFTN Address) ZBBBYPYX to (column 5) DISSEMINATION TO, for METAR Bulletins from (column 1) ROC (Name) Bangkok, Colombo, Delhi, Jakarta, Kuala Lumpur, Kolkata and Mumbai
	MET/IE WG/20, Action item 20/11;	**Add** (CCCC, Aerodrome) ZMCK, ULAANBAATAR/Chinggis Khaan to METAR Bulletin (column 2), BUL No. SACI31; **Delete** (CCCC, Aerodrome) ZMCK, ULAANBAATAR/Chinggis Khaan from METAR Bulletin (column 2), BUL No. SACI32
	MET/IE WG/21, WP/11; MET/IE WG/21 Report, para 6.8; Action item MET/IE WG/21-10	**Delete** (BUL Time) HH+30 (column 3) for (CCCC, Aerodrome) ZBSJ, SHIJIAZHUANG/Zhengding and ZWSH, KASHI/Kashi in METAR Bulletin (column 2), BUL No. SACI31
	MET/IE WG/21, WP/13; MET/IE WG/21 Report, para 6.12-6.14; Action item MET/IE WG/21-13	**Add** (CCCC, Aerodrome) RPLC, PAMPANGA/Clark Intl and RPVP, PUERTO PRINCESA/Intl to METAR Bulletin (column 2), BUL No. SAHK31; **Amend** Aerodrome names for (CCCC) RCTP, RPLI, RPMZ, VHHH and VMMC in METAR Bulletin (column 2), BUL No. SAHK31; **Amend** Available time (column 4) for (CCCC) RPLI, RPMD and RPMZ in METAR Bulletin (column 2), BUL No. SAHK31; **Change** font to italics to indicate Aerodromes not listed in Table AOP I-1 in METAR Bulletin (column 2), BUL No. SAHK31
	MET/IE WG/21, WP/19; MET/IE WG/21 Report, para 6.15-6.17; Action item MET/IE WG/21-14	**Delete** (CCCC, Aerodrome) VTCT, CHIANG RAI/Chiang Rai Intl Airport, and VTSG, KRABI from METAR Bulletin (column 2), BUL No. SAAE31; **Add** (CCCC, Aerodrome, Bul. Time) VDSV, SIHANOUK, HH+00/30 to METAR Bulletin (column 2), BUL No. SAAE32; **Add** (CCCC, Aerodrome, Bul. Time) VVVD, Van Don Int'l, HH+00/30 to METAR Bulletin (column 2), BUL No. SAAE34;

SECTION	REFERENCES	UPDATES
		Add (CCCC, Aerodrome, Bul. Time, Available) VTCT, CHIANG RAI/Chiang Rai Intl Airport, HH+00, and VTPT, TAK, HH+00, 2200-1100 to METAR Bulletin (column 2), BUL No. SATH31; **Add** (CCCC, Aerodrome, Bul. Time, Available) VTSG, KRABI, HH+00, and VTSY, BATONG, HH+00, 0000-1000 to METAR Bulletin (column 2), BUL No. SATH32. **Change** font to italics to indicate Aerodromes not listed in Table AOP I-1 in METAR Bulletin (column 2), BUL No. SAAE33 and SATH33; **Change** font from italics to indicate Aerodromes listed in Table AOP I-1 in METAR Bulletin (column 2), BUL No. SAAE34, SATH31 and SATH32; **Amend** Available time (column 4) for (CCCC) VTBO, VTCH, VTCN, VTCP, VTUK, VTUL, VTUU and VTUW in METAR Bulletin (column 2), BUL No. SATH31, SATH32 and SATH33 in METAR Bulletin (column 2), BUL No. SATH31, SATH32 and SATH33. **Add** (RODB/ROC) Beijing, (AFTN Address) ZBBBYPYX to (column3) Dissemination, for METAR Bulletins (column 2) SAAE31, SAAE32, SAAE33, SAAE34, SATH31, SATH32 and SATH33
	MET/IE WG/21 Report, para 6.3; Action item MET/IE WG/21–09	**Remove** the requirement to indicate the RODB responsible for storing the METAR and TAF bulletins in bold text in Appendix A and B
	MET/IE WG/21 Report, para 6.3; Action item MET/IE WG/21–09; Email from Pakistan Civil Aviation Authority to ICAO, 27 March 2023	**Replace** (CCCC, Aerodrome) OPRN, ISLAMABAD/Chaklala, with OPIS, Islamabad International Airport, and OPGD, GWADAR, with OPGW, New Gwadar International Airport, in METAR Bulletin (column 2), BUL No. SAPK31; **Add** (CCCC, Aerodrome, Bul. Time) OPMT, SIHANOUK, HH+00/30, and OPST, Multan, HH+00/30, and OPFA, Failsalabad, HH+00/30, to METAR Bulletin (column 2), BUL No. SAPK31
	Email from Airservices Australia to ICAO, 28 March 2023	**Add** (CCCC, Aerodrome, Bul. Time) YSBU, SUNSHINE COAST AIRPORT, HH+00/30 to METAR Bulletin (column 2), BUL No. SAAU32.
APPENDIX B/TABLE B - Collection and Dissemination of TAF (FT) Bulletins	MET/IE WG/19, Action item 19/02	**Change** (AFTN address) NZZZYPYA and NZZYPYA to NZZZYPYX for Dissemination (column 3) to (RODB/ROC) Wellington
	MET/IE WG/20, Action item 20/11	**Add** (CCCC, Aerodrome, TAF validity) ZMCK, ULAANBAATAR/Chinggis Khaan, 30 to TAF Bulletin (column 2), BUL No. FTCI31; **Delete** (CCCC, Aerodrome, TAF validity) ZMCK, ULAANBAATAR/Chinggis Khaan, 30 from TAF Bulletin (column 2), BUL No. FTCI32

SECTION	REFERENCES	UPDATES
	MET/IE WG/21, WP/12; MET/IE WG/21 Report, para 6.11; Action item MET/IE WG/21-11	**Change** TAF validity from 24 to 30 for all Aerodromes in TAF Bulletin (column 2), BUL No. FTNZ31; **Add** Filing time 0235, 0835, 1435 and 2035 to TAF Bulletin (column 2), BUL No. FTNZ31; **Add** Start of validity 0300, 0900, 1500 and 2100 to TAF Bulletin (column 2), BUL No. FTNZ31;
	MET/IE WG/21, WP/13; MET/IE WG/21 Report, para 6.12-6.14; Action item MET/IE WG/21-13	**Delete** (CCCC) RCTP, RCKH, RCSS, RCMQ, RCNN, RCFN, VMMC, RPLL, RPVM, RPMD, RPLB, RPMZ and RPLI from TAF Bulletin (column 2), BUL No. FTHK31; **Add** Filing time 0235, 0835, 1435 and 2035 to TAF Bulletin (column 2), BUL No. FTHK31; **Add** Start of validity 0300, 0900, 1500 and 2100 to TAF Bulletin (column 2), BUL No. FTHK31; **Add** new TAF Bulletin (column 2) FTHK32, for ROC (column 1) (Name, CCCC) Hong Kong, VHHH, with Filing time 0535, 1135, 1735 and 2335, and Start of validity 0600, 1200, 1800 and 0000, including (CCCC, Aerodrome, TAF validity): RCKH, GAOXIONG, 30; RCTP, TAIBEI CITY/Taibei Intl, 30; RPLC, PAMPANGA/Clark Intl, 30; RPLL, MANILA/Ninoy Aquino Intl, 30; RPVM, LAPU-LAPU/Mactan, Cebu, 30; and VMMC, MACAO/Intl, 30; **Add** new TAF Bulletin (column 2) FTHK33, for ROC (column 1) (Name, CCCC) Hong Kong, VHHH, with Filing time 0535, 1135, 1735 and 2335, and Start of validity 0600, 1200, 1800 and 0000, including (CCCC, Aerodrome, TAF validity): RCSS, TAIBEI/Songshan, 24; RCMQ, TAICHUNG/Qingquangang, 24; RCNN, TAINAN, 24; RCFN, TAIDONG/Fengnian, 24; RPMD, DAVAO/Francisco Bangoy Intl, 24; RPLB, SUBIC BAY/Intl, 24; RPLI, LAOAG/Intl, 24; RPMZ, ZAMBOANGA/Intl, 24; and RPVP, PUERTO PRINCESA/Intl, 24
	MET/IE WG/21, WP/19; MET/IE WG/21 Report, para 6.15-6.17; Action item MET/IE WG/21-14	**Delete** (CCCC, Aerodrome) VTCT, CHIANG RAI/Chiang Rai Intl Airport, and VTSG, KRABI from TAF Bulletin (column 2) FTAE31; **Add** (CCCC, Aerodrome, TAF validity) VDSV, SIHANOUK, 18 (24) to TAF Bulletin (column 2) FTAE32; **Add** (CCCC, Aerodrome, TAF validity) VVVD, Van Don Int'l, 24 to TAF Bulletin (column 2) FTAE34; **Add** (CCCC, Aerodrome, TAF validity) VTCT, CHIANG RAI/Chiang Rai Intl Airport, 30 to TAF Bulletin (column 2) FTTH31; **Add** (CCCC, Aerodrome, TAF validity) VTSG, KRABI, 24, and VTSY, BATONG, 24 to TAF Bulletin (column 2) FTTH32;

SECTION	REFERENCES	UPDATES
		Change font to italics to indicate Aerodromes not listed in Table AOP I-1 in TAF Bulletin (column 2) FTTH31 and FTTH 33; **Change** font from italics to indicate Aerodromes listed in Table AOP I-1 in TAF Bulletin (column 2) FTAE32, FTAE33, FTAE34, FTTH31 and FTTH32; **Change** TAF validity (column 4) from 18 to 24 for (CCCC) VLLB, VLLN, VLPS and VLSK in TAF Bulletin (column 2) FTAE33; **Add** (RODB/ROC) Beijing, (AFTN Address) ZBBBYPYX to (column 3) Dissemination, for TAF Bulletins (column 2) FTTH31, FTTH32 and FTTH33
	MET/IE WG/21 Report, para 6.3; Action item MET/IE WG/21–09	**Remove** the requirement to indicate the RODB responsible for storing the METAR and TAF bulletins in bold text in Appendix A and B
	MET/IE WG/21 Report, para 6.3; Action item MET/IE WG/21–09; Email from Pakistan Civil Aviation Authority to ICAO, 27 March 2023	**Replace** (CCCC, Aerodrome) OPRN, ISLAMABAD/Chaklala, with OPIS, Islamabad International Airport, and OPGD, GWADAR, with OPGW, New Gwadar International Airport, in TAF Bulletin (column 2), BUL No. FTPK31; **Add** (CCCC, Aerodrome, TAF validity) OPMT, SIHANOUK, 24, and OPST, Multan, 24, and OPFA, Failsalabad, 24, to TAF Bulletin (column 2), BUL No. FTPK31
	Email from Airservices Australia to ICAO, 28 March 2023	**Add** (CCCC, Aerodrome, TAF validity) YSBU, SUNSHINE COAST AIRPORT, 24 to TAF Bulletin (column 2), BUL No. FTAU32.
APPENDIX D - Use of WMO Abbreviated Heading	MET/IE WG/20, Action item 20/08	**Delete** (sub-para. 2.1.2. c) list of area designators
	MET/IE WG/21 Report, para 6.3; Action item MET/IE WG/21-09	**Correct** the references to IWXXM TAF bulletins from “LC” to “LT” in para. 2.1.1
APPENDIX I - ROBEX FOCAL POINTS	MET/IE WG/20, Action item 20/07; Email from Malaysian Meteorological Department to ICAO, 27 March 2023	**Update** focal point NAME/DESIGNATION AND ADDRESS and Tel/Fax/e-mail information for Malaysia and Thailand
	Email from Pakistan Civil Aviation Authority to ICAO, 14 February 2023	**Update** focal point NAME/DESIGNATION and Tel information for Pakistan
	Email from Meteorological Service Singapore to ICAO, 23 March 2023	**Update** focal point NAME/DESIGNATION AND ADDRESS and Tel/Fax/e-mail information for Singapore
	Email from United States FAA to ICAO, 28 March 2023	**Update** focal point NAME/DESIGNATION AND ADDRESS and Tel/Fax/e-mail information for United States

INTERNATIONAL CIVIL AVIATION ORGANIZATION

ASIA PACIFIC
ROBEX HANDBOOK

Fifteenth Edition — March 2023

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

RECORD OF AMENDMENTS AND CORRIGENDA

Amendments			
No.	Date of issue	Date entered	Entered by
1			
2			
3			
4			
5			
6			
7			
8			
9			
10			
11			
12			

Corrigenda			
No.	Date of issue	Date entered	Entered by

Table of Contents

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;

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

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

2.2 Structure

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

2.3 Purpose

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

2.4 Introduction of IWXXM Exchange

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

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

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

Amendment 78 (8 November 2018) will require the international exchange of XML-formatted METAR/SPECI, TAF, AIRMET and SIGMET, VAA and TCA to be raised to a standard, although the provisions relating specifically to IWXXM will not become applicable until 5 November 2020.

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

2.4.3 This edition of the Handbook focuses largely on the exchange of OPMET in TAC form because all States currently have the ability to send and receive OPMET in TAC form. Only a limited number of States have developed the capability to send and receive OPMET in IWXXM. In addition, AMHS with FTBP has yet to be implemented in a number of APAC States. It should be noted that AFTN cannot be used to disseminate IWXXM coded OPMET. However, some information on the exchange of OPMET in IWXXM is provided in this Handbook, but detailed information on IWXXM, and the

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

2.4.4 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 SPECI	SA SP	LA LP

Data type	Abbreviated name	WMO data type designator	
		TAC	IWXXM
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 TAF, which don't meet IATA requirements, but are nevertheless classified as FT for the WMO data type designator.

3.2 OPMET bulletins

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

3.2.2 The format of OPMET bulletins is determined by:

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

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

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

3.3 Types of OPMET exchange

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

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

3.3.1.1.1 *Regular exchange* is a scheduled exchange that encompasses 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;
- NOCs or other COM or MET offices in the States in their area of responsibilities, as agreed between the ROC and the States' authorities concerned.

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

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

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

- To support the ROBEX Scheme and to facilitate a regular exchange of OPMET information based on predetermined distribution within the APAC Region; and
- To provide facilities for request/response type of access to the stored OPMET data for users to obtain non-regular or occasional information.

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

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

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

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

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

5. COMMUNICATIONS - GENERAL

5.1 Exchange of OPMET

5.1.1 According to *Annex 3, Chapter 11, 11.1.9*, the telecommunications facilities used for the exchange of OPMET should be the aeronautical fixed service (AFS) or, for the exchange of non-time-critical OPMET, the public internet,

subject to availability, satisfactory operation and bilateral/multilateral and/or regional air navigation agreement.

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

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

5.2 Use of AFTN/AMHS

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

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

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

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

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

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

GG – for TAF, METAR and SPECI

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

6. METAR/SPECI EXCHANGE

6.1 General

6.1.1 Routine METAR reports should be prepared for the international aerodromes listed in the *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.

7.2.3 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.

8.2.3 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
AFTN header	
Priority Indicator and Address Date and Time of filing and Originator	GG VTBBYPYX 271304 ZBBBYPYX
WMO Abbreviated Heading	SACI31 ZBBB 271300
METAR messages	METAR ZBAA 271300Z ..…… = METAR ZBTJ 271300Z …….=
AFTN Normal Ending	NNNN

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

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

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

Example: METAR ZBTJ 271200Z NIL=

6.5 SPECI Bulletins in TAC - Format and Content

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

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

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

6.6 METAR and SPECI Bulletins in IWXXM - Format and Content

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

7. TAF EXCHANGE

7.1 General

7.1.1 Aerodrome forecast (TAF) should be prepared by the aerodrome meteorological offices (AMO) or other meteorological offices, designated for the provision of TAF by the State's meteorological authority, for all international aerodromes, for which TAF is required (refer to the *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
AFTN header	
Priority Indicator and Address Date and Time of filing and Originator	GG YBBBYPYX 271104 ZBBBYPYX
WMO Abbreviated Heading	FTCI31 ZBBB 271100
TAF messages	TAF ZBAA 271100Z 2712/2812..…= TAF ZBTJ 271100Z 2712/2812…….=
AFTN Normal Ending	NNNN

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

TAF VTBD 281000Z NIL=

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

TAF VTBD 281100Z 2812/2912 CNL=

7.5 TAF Bulletins in IWXXM - Format and Content

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

7.6 Summary of OPMET data issuance

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

METAR observation, compiling and filing

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

TAF issuance, compiling and filing

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

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.

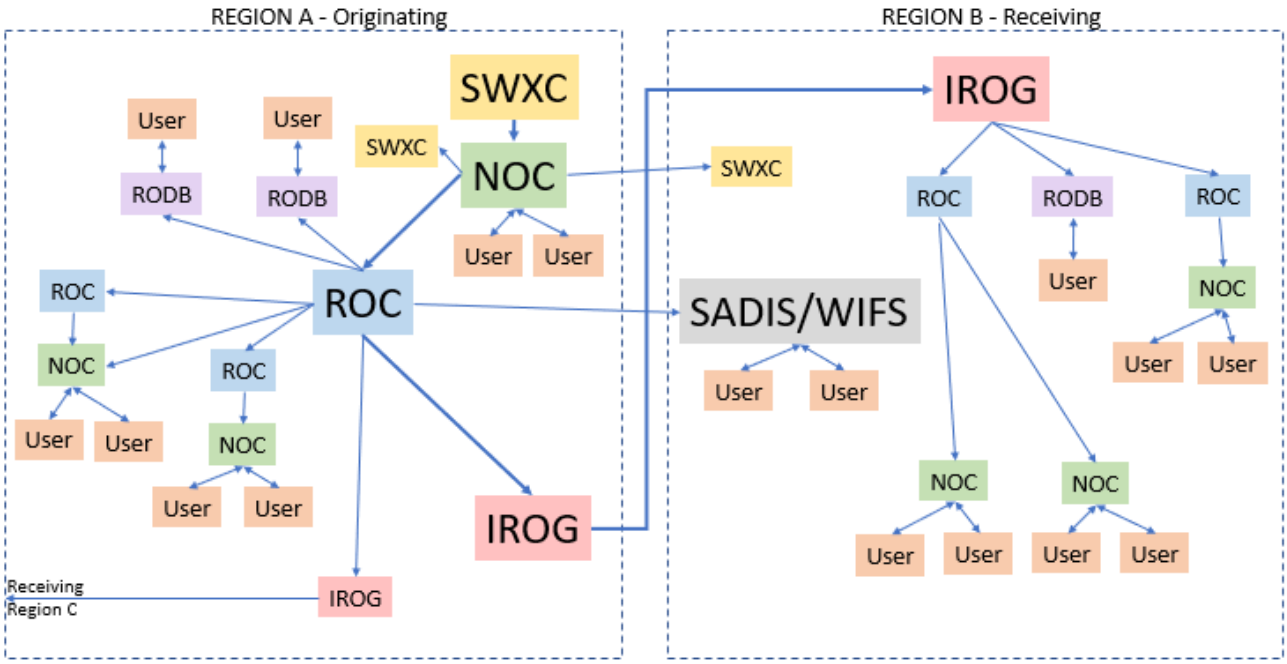
9.3. **Data Access**

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 ZJSYYMYX
090726 WSSSYMYX
UASR71 WSSS 090700
ARS QFA129 0328N 12831E 0639 FL380 VOLCANO DUKONO 0608-01
DRIFT OF VA SE PLUME HGT EST FL100 OR LOWER SUP INFO REPORTS
GOOD VISIBILITY=

11. REGIONAL OPMET DATA BANKS (RODB)

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

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

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*.

[1] 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.

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

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:

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

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 three performance indicators (PIs) (Compliance, Availability and Regularity indices) of the scheduled, routine METAR and TAF OPMET data (TAC - SA and FT; IWXXM – LA and ~~LC~~ 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 three 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).
(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*.

Appendices

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

Table A : METAR

Explanation of Table

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

Col.2: Description of the METAR Bulletin

Col.3: Official observation time of the bulletin

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

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

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

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

~~*3*~~ *2* *METAR included in VOLMET broadcasts are listed in APAC, ANP, VOL II, Table MET II-3, VOLMET Broadcasts*

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

1		2			3	4	5	
ROC		**METAR Bulletin**			**Bul. Time**	**Available**	**DISSEMINATION TO**	
Name	**CCCC**	**BUL No.**	**CCCC**	**Aerodrome**			**RODB/ROC**	**AFTN Address**
ASIA/PAC REGION								
Bangkok	**VTBB**	**SAAE31**	VTBD	BANGKOK/Don Mueang Intl Airport	HH+00/30		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	WSZZYPYM
			~~VTCT~~	~~CHIANG RAI/Chiang Rai Intl Airport~~	~~HH+00/30~~		TOKYO	RJTDYPYX
			~~VTSG~~	~~KRABI~~	~~HH+00/30~~		Beijing	ZBBBYPYX
			VTSP	PHUKET/Phuket Intl Airport	HH+00/30		Colombo	VCCCYPYX
			VTSS	SONGKHLA/Hat Yai Intl Airport	HH+00/30		Delhi	VIDPYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYX
							Jakarta	WIZZMCMC
							Kolkata	VECCYPYX
							Kuala Lumpur	WMZZYPYR
							Mumbai	VABBYPYX
		SAAE32	VDPP	PHNOM PENH	HH+00/30		BANGKOK	VTBBYPYX
			VDSR	SIEM REAP	HH+00/30		BRISBANE	YBBBYPYX
			VDSV	*SIHANOUK*	HH+00/30		NADI	NFFNYPYX
			VLVT	VIENTIANE (Wattay)	HH+00/30		SINGAPORE	WSZZYPYM
			VYMD	MANDALAY INTERNATIONAL	HH+00/30		TOKYO	RJTDYPYX
			VYNT	NAYPYITAW INTERNATIONAL	HH+00/30		Beijing	ZBBBYPYX
			VYYY	YANGON INTERNATIONAL	HH+00/30		Colombo	VCCCYPYX
							Delhi	VIDPYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYX
							Jakarta	WIZZMCMC
							Kolkata	VECCYPYX
							Kuala Lumpur	WMZZYPYR
							Mumbai	VABYPYX
		SAAE33	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	WSZZYPYM
							TOKYO	RJTDYPYX
							Beijing	ZBBBYPYX
		SAAE34	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	WSZZYPYM
			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	VCCCYPYX
			VVTS	HO CHI MINH/Tan Son Nhat	HH+00/30		Delhi	VIDPYPYX
			VVVD	Van Don Int'l	HH+00/30		Hong Kong	VHZZYPYX
							Incheon	RKSIYPYX
							Jakarta	WIZZMCMC
							Kolkata	VECCYPYX
							Kuala Lumpur	WMZZYPYR
							Mumbai	VABYPYX
		SATH31	*VTBO*	*TRAT/Khao Sming*	HH+00	~~00~~2200-1100	BANGKOK	VTBBYPYX

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
			VTCH	*MAE HONG SON*	HH+00	002200-1100	BRISBANE	YBBBYPYX
			VTCL	*LAMPANG*	HH+00	2300-12300	NADI	NFFNYPYX
			VTCN	*NAN*	HH+00	002200-11300	SINGAPORE	WSZZYPYM
			VTCP	*PHRAE*	HH+00	002200-1100	TOKYO	RJTDYPYX
			VTCT	CHIANG RAI/Chiang Rai Intl Airport	HH+00		Beijing	ZBBBYPYX
			VTPB	*PHETCHABUN*	HH+00	2200-1100		
			VTPH	PRACHUAP KHIRI KHAN/Hua Hin	HH+00	002200-1100		
			VTPM	*TAK/Mae Sot*	HH+00	2200-1100		
			VTPO	*SUKHOTHAI*	HH+00	23200-14100		
			VTPP	PHITSANULOK	HH+00	23200-14500		
			VTPT	*TAK*	HH+00	2200-1100		
		SATH32	VTSB	SURAT TANI	HH+00	23200-14500	BANGKOK	VTBBYPYX
			VTSC	*NARATHIWAT*	HH+00	002200-1100	BRISBANE	YBBBYPYX
			VTSE	*CHUMPHON/Tab Gai*	HH+00	2300-1100	NADI	NFFNYPYX
			VTSF	*NAKHON SI THAMMARAT*	HH+00	23200-14500	SINGAPORE	WSZZYPYM
			VTSG	KRABI	HH+00		TOKYO	RJTDYPYX
			VTSM	SURAT THANI/Samui	HH+00	23200-14500	Beijing	ZBBBYPYX
			VTSR	*RANONG*	HH+00	23200-13100		
			VTST	*TRANG*	HH+00	002200-11300		
			VTSY	*BATONG*	HH+00	0000-1000		
		SATH33	*VTUD*	*UDON THANI*	HH+00	23200-14500	BANGKOK	VTBBYPYX
			VTUI	*SAKON NAKHON/Ban Khai*	HH+00	2200-1500	BRISBANE	YBBBYPYX
			VTUK	*KHON KAEN*	HH+00	2300-1400	NADI	NFFNYPYX
			VTUL	*LOEI*	HH+00	23200-1200	SINGAPORE	WSZZYPYM
			VTUO	*BURI RAM*	HH+00	2200-1300	TOKYO	RJTDYPYX
			VTUQ	*NAKHON RATCHASIMA*	HH+00	23200-1400	Beijing	ZBBBYPYX
			VTUU	*UBON RATCHATHANI*	HH+00			
			VTUV	*ROI ET*	HH+00	2200-1400		
			VTUW	*NAKHON PHANOM*	HH+00	002200-1400		
Beijing	**ZBBB**	**SACI31**	ZBAA	BEIJING/Capital	HH+00/30		BANGKOK	VTBBYPYX
			ZBSJ	*SHIJIAZHUANG/Zhengding*	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
			ZWSH	KASHI/Kashi	HH+00/30		Incheon	RKSIYPYX
			ZWWW	URUMQI/Diwopu	HH+00/30		Ulaanbaatar	ZMUBYMYX
			ZYTL	DALIAN/Zhoushuizi	HH+00/30			
			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

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**
			ZGSZ	SHENZHEN/Baoan	HH+00		SINGAPORE	WSZZYPYM
			ZLXY	XI'AN/Xianyang	HH+00		TOKYO	RJTDYPYX
			~~ZMCK~~	~~ULAANBAATAR / Chinggis Khaan~~	~~HH+00~~		Hong Kong	VHZZYPYX
			ZMUB	ULAANBAATAR / Buyant-Ukhaa	HH+00		Jakarta	WIZZMZBB
			ZPPP	KUNMING/Wujiaba	HH+00		Kuala Lumpur	WMZZYPYX
			ZSAM	XIAMEN/Gaoqi	HH+00		Incheon	RKSIYPYX
			ZSFZ	FUZHOU/Changle	HH+00		Wellington	NZZZYPYX
			ZSNB	*NINGBO/Lishe*	HH+00			
			ZSQD	QINGDAO/Liuting	HH+00			
			ZUUU	CHENGDU/Shuangliu	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
			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	ZMUBYMYX
			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	YBBBYPYX
			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	ZBBBYPYX
			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	YBBBYPYX
			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	ZBBBYPYX
			YPCC	COCOS (KEELING) ISLAND Intl	HH+00/30		Hong Kong	VHZZYPYX
			YCFS	*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			

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
		SAAU33	*YGEL*	*GERALDTON*	HH+00/30		BANGKOK	VTBBYPYX
			YGLA	*GLADSTONE*	HH+00/30		BRISBANE	YBBBYPYX
			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	ZBBBYPYX
			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	YBBBYPYX
							NADI	NFFNYPYX
							SINGAPORE	WSZZYPYX
							TOKYO	RJTDYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYS
							Jakarta	WIZZYPYX
							Wellington	NZZZYPYX
		SAAU35	*YCIN*	*CURTIN*	HH+00/30		BANGKOK	VTBBYPYX
			YFRT	*FORREST*	HH+00/30		BRISBANE	YBBBYPYX
			YPKU	*KUNUNURRA*	HH+00/30		NADI	NFFNYPYX
			YPGV	*GOVE*	HH+00/30		SINGAPORE	WSZZYPYX
							TOKYO	RJTDYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYS
							Jakarta	WIZZYPYX
							Wellington	NZZZYPYX
		SAAU36	*YAMB*	*AMBERLEY*	HH+00/30		BANGKOK	VTBBYPYX
			YPEA	*PEARCE*	HH+00/30		BRISBANE	YBBBYPYX
			YPTN	TINDAL	HH+00/30		NADI	NFFNYPYX
			YBTL	TOWNSVILLE/Townsville Intl	HH+00/30		SINGAPORE	WSZZYPYX
			YWLM	*WILLIAMTOWN*	HH+00/30		TOKYO	RJTDYPYX
							Beijing	ZBBBYPYX
							Hong Kong	VHZZYPYX
							Incheon	RKSIYPYS
							Jakarta	WIZZYPYX
							Manila	RPLLYPYX
							Mumbai	VABBYPYX
							Wellington	NZZZYPYX
		SANG31	AYPY	PORT MORESBY Intl	HH+00		BANGKOK	VTBBYPYX
			AYWK	*WEWAK*	HH+00	NR	BRISBANE	YBBBYPYX
			AYVN	VANIMO	HH+00	NR	NADI	NFFNYPYX
			AYNZ	*NADZAB*	HH+00	NR	SINGAPORE	WSZZYPYM
			AYMH	*MOUNT HAGEN*	HH+00	NR	TOKYO	RJTDYPYX
			AYGN	*GURNEY*	HH+00	NR	Beijing	ZBBBYPYX
			AYMO	*MOMOTE*	HH+00	NR	Hong Kong	VHZZYPYX
			ANYN	NAURU I.	HH+00		Jakarta	WIZZMIMI
			AGGH	HONIARA (HENDERSON)	HH+00		Wellington	NZZZYPYX

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**
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
							SINGAPORE	WSZZYPYM
		SAMV31	VRMG	GAN INTERNATIONAL AIRPORT	HH+10		TOKYO	RJTDYPYX
			VRMH	HANIMAADHOO INTERNATIONAL AIRPORT	HH+10		Beijing	ZBBBYPYX
			VRMM	MALE INTERNATIONAL AIRPORT	HH+10		Hong Kong	VHZZYPYX
							Kuala Lumpur	WMZZYPYR
							Mumbai	VABBYPYX
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
							Beijing	ZBBBYPYX
							Kolkata	VECCYPYX
							Hong Kong	VHZZYPYX
							Karachi	OPZZYPYX
							Mumbai	VABBYPYX
Hong Kong	**VHHH**	**SAHK31**	VHHH	HONG KONG/Int~~ernational~~	HH+00/30		BANGKOK	VTBBYPYX
			RCTP	TAIBEI CITY/Taibei Intl ~~Ap~~	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	2200-1200	Kuala Lumpur	WMZZYPYR
			VMMC	MACAO/Intl ~~Airport~~	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	~~2200-1000~~		
			RPLB	*SUBIC BAY, Subic Bay Intl*	HH+00			
			RPLI	LAOAG~~, Laoag~~/Intl	HH+00	2~~2~~100-1~~0~~200, 1500, 1800		
			RPMZ	*ZAMBOANGA~~, Zamboanga~~/Intl*	HH+00	2~~2~~100-1~~0~~200, 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

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**
Jakarta	**WIII**	**SAID31**	WAAA	UJUNG PANDANG/Hasanuddin	HH+00/30		BANGKOK	VTBBYPYX
			WABB	BIAK/Frans Kaisiepo	HH+00/30		BRISBANE	YBBBYPYX
			WIHH	JAKARTA/Halimperdana Kusuma	HH+00/30	2200-1700	NADI	NFFNYPYX
			WIII	JAKARTA/Soekarno Hatta (COMM CENTER)	HH+00/30		SINGAPORE	WSZZYPYM
			WIDD	BATAM/Hang Nadim	HH+00/30		TOKYO	RJTDYPYX
			WIMM	MEDAN/Polonia	HH+00/30		Beijing	ZBBBYPYX
			WADD	BALI/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		BANGKOK	VTBBYPYX
			WIBB	PEKANBARU/Sultan Syarif Kasim II	HH+00/30		BRISBANE	YBBBYPYX
			WIDN	TANJUNG PINANG/Kijang	HH+00/30	2200-0500	NADI	NFFNYPYX
			WIEE	PANDANG/MINANGKABAU	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	BALIK PAPAN/Sepinggan	HH+00/30		Kuala Lumpur	WMZZYPYR
			WADL	*PRAYA/LOMBOK INTERNATIONAL*	HH+00/30		Wellington	NZZZYPYX
		SAID33	WAYY	TIMIKA/Moses Kilangin	HH+00/30	2100-0800	BANGKOK	VTBBYPYX
			WAJJ	JAYAPURA/Sentani	HH+00/30		BRISBANE	YBBBYPYX
			WAKK	MERAUKE/Mopah	HH+00/30	2200-0500	NADI	NFFNYPYX
			WAPP	AMBON/Pattimura	HH+00/30		SINGAPORE	WSZZYPYM
			WAHS	*SEMARANG/A.Yani*	HH+00/30		TOKYO	RJTDYPYX
			WILL	*BANDAR LAMPUNG/Radin Inten*	HH+00/30		Beijing	ZBBBYPYX
			WATT	KUPANG/El Tari	HH+00/30		Hong Kong	VHZZYPYX
			WAQQ	TARAKAN/Juwata	HH+00/30	2000-1300	Kuala Lumpur	WMZZYPYR
							Wellington	NZZZYPYX
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	VCCCYPYX
		SAAS31	VNKT	KATHMANDU	HH+00/30		Delhi	VIDPYPYX
			VQPR	PARO/Intl.	HH+00/30		Hong Kong	VHZZYPYX
							Karachi	OPZZYPYX
							Mumbai	VABBYPYX
Karachi	**OPKC**	**SAPK31**	OPKC	KARACHI/Jinnah Int'l	HH+00/30		BANGKOK	VTBBYPYX
			~~OPRN~~ OPIS	~~ISLAMABAD/Chaklala~~ 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
			~~OPGD~~ *OPGW*	~~GWADAR~~ *New Gwadar International Airport*	HH+00/30		TOKYO	RJTDYPYX
			OPPS	PESHAWAR	HH+00/30		Abu Dhabi	OMZZYPYX

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
			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
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	VCCCYPYX
							Hong Kong	VHZZYPYX
							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	VCCCYPYX
			WMKL	PULAU LANGKAWI/Intl	HH+00		Hong Kong	VHZZYPYX
			WMKM	*MALACCA*	HH+00		Jakarta	WIZZMBMB
							Manila	RPLLYPYX
							Mumbai	VABBYPYX
							Incheon	RKSIYPYX
							Wellington	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	VCCCYPYX
			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

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
			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
			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	*OBIHIRO*	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		

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**
			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

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

Table B : FT TAF

Explanation of the Table

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

Col. 2: Description of the TAF Bulletin

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

Notes:

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

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

~~*3*~~ *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.*

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

~~*5*~~ *4* *Aerodromes not listed in Table AOP 1 are indicated in italics.*

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

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
ASIA/PAC REGION									
Bangkok	**VTBB**	**FTAE31**	VTBD	BANGKOK/Don Mueang Intl Airport	0535	0600	30	BANGKOK	VTBBYPYX
			VTBS	BANGKOK/Suvarnabhumi Intl Airport	1135	1200	30	BRISBANE	YBBBYPYX
			VTBU	RAYONG/U-Tapao Intl	1735	1800	24	NADI	NFFNYPYX
			VTCC	CHIANG MAI/Chiang Mai Intl. Airport	2335	0000	30	SINGAPORE	WSZZYPYX
			~~VTCT~~	~~CHIANG RAI/Chiang Rai Intl Apt~~	-	-	~~24~~	TOKYO	RJTDYPYX
			~~VTSG~~	~~KRABI~~	-	-	~~30~~	Abu Dhabi	OMZZYPYX
			VTSP	PHUKET/Phuket Intl			30	Bahrain	OBZZYPYX
			VTSS	SONGKHLA/Hat Yai Intl			24	Beijing	ZBBBYPYX
								Beirut	OLLLYPYX
								Hong Kong	VHZZYPYX
								Jeddah	OEJDYPYX
								Karachi	OPZZYPYX
								Kuala Lumpur	WMZZYPYR
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPY~~A~~X
		FTAE32	VDPP	PHNOM PENH	0535	0600	18 (24)	BANGKOK	VTBBYPYX
			VDSR	SIEM REAP	1135	1200	18 (24)	BRISBANE	YBBBYPYX
			VDSV	*SIHANOUK*	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
				*Issued 0500/1100				Karachi	OPZZYPYX
								Kuala Lumpur	WMZZYPYR
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPY~~A~~X
		FTAE33	VLLB	LUANG PRABANG	0535	0600	~~18~~ 24	BANGKOK	VTBBYPYX
			VLLN	*LUANG NAMTHA*	1135	1200	~~18~~ 24	BRISBANE	YBBBYPYX
			VLPS	PAKSE	2335	0000	~~18~~ 24	NADI	NFFNYPYX
			VLSK	SAVANNAKHET			~~18~~ 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	NZZZYPY~~A~~X
		FTAE34	VVCI	CAT BI	0535	0600	24	BANGKOK	VTBBYPYX
			VVCR	KHANH HOA/Cam Ranh Int'l	1135	1200	30	BRISBANE	YBBBYPYX
			VVCT	CAN THO/Can Tho Int'l	1735	1800	24	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
			VVPQ	KIEN GIANG/Phu Quoc Int'l			24	Bahrain	OBZZYPYX
			VVTS	HO CHI MINH/Tan Son Nhat			24	Beijing	ZBBBYPYX
			VVVD	Van Don Int'l			24	Beirut	OLLLYPYX
								Hong Kong	VHZZYPYX
								Jeddah	OEJDYPYX
								Karachi	OPZZYPYX
								Kuala Lumpur	WMZZYPYR
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPY~~A~~X
		FTTH31	*VTBO*	*TRAT/Khao Sming*	0535	0600	24	BANGKOK	VTBBYPYX

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

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			VTCH	*MAE HONG SON*	1135	1200	24	BRISBANE	YBBBYPYX
			VTCL	*LAMPANG*	1735	1800	24	NADI	NFFNYPYX
			VTCN	*NAN*	2335	0000	24	SINGAPORE	WSZZYPYX
			VTCP	*PHRAE*			24	TOKYO	RJTDYPYX
			VTCT	CHIANG RAI/Chiang Rai Intl Airport			30	Beijing	ZBBBYPYX
			VTPB	*PHETCHABUN*			24		
			VTPH	PRACHUAP KHIRI KHAN/Hua Hin			24		
			VTPM	*TAK/MAE SOT*			24		
			VTPO	*SUKHOTHAI*			24		
			VTPP	*PHITSANULOK*			24		
			VTPT	*TAK*			24		
		FTTH32	VTSB	SURAT THANI	0535	0600	24	BANGKOK	VTBBYPYX
			VTSC	*NARATHIWAT*	1135	1200	24	BRISBANE	YBBBYPYX
			VTSE	*CHUMPHON/Tab Gai*	1735	1800	24	NADI	NFFNYPYX
			VTSF	*NAKHON SI THAMMARAT*	2335	0000	24	SINGAPORE	WSZZYPYX
			VTSG	KRABI			24	TOKYO	RJTDYPYX
			VTSM	SURAT THANI/Samui			24	Beijing	ZBBBYPYX
			VTSR	*RANONG*			24		
			VTST	*TRANG*			24		
			VTSY	*BATONG*			24		
		FTTH33	*VTUD*	*UDON THANI*	0535	0600	24	BANGKOK	VTBBYPYX
			VTUI	*SAKON NAKHON/Ban Khai*	1135	1200	24	BRISBANE	YBBBYPYX
			VTUK	*KHON KAEN*	1735	1800	24	NADI	NFFNYPYX
			VTUL	*LOEI*	2335	0000	24	SINGAPORE	WSZZYPYX
			VTUO	*BURI RAM*			24	TOKYO	RJTDYPYX
			VTUQ	*NAKHON RATCHASIMA*			24	Beijing	ZBBBYPYX
			VTUU	*UBON RATCHATHANI*			24		
			VTUV	*ROI ET*			24		
			VTUW	*NAKHON PHANOM*			24		
Beijing	**ZBBB**	**FTCI31**	ZBAA	BEIJING/Capital	0535	0600	30	BANGKOK	VTBBYPYX
			ZBSJ	*SHIJIAZHUANG/Zhengding*	1135	1200	24	BRISBANE	YBBBYPYX
			ZBTJ	TIANJIN/Binhai	1735	1800	24 (30)	NADI	NFFNYPYX
			ZBYN	TAIYUAN/Wusu	2335	0000	24	SINGAPORE	WSZZYPYX
			ZGGG	GUANGZHOU/Baiyun			30	TOKYO	RJTDYPYX
			ZMCK	ULAANBAATAR/Chinggis Khaan			30	Hong Kong	VHZZYPYX
			ZSHC	HANGZHOU/Xiaoshan			24	Karachi	OPZZYPYX
			ZSPD	SHANGHAI/Pu Dong			30	Mumbai	VABBYPYX
			ZSSS	SHANGHAI/Hongqiao			24	Incheon	RKSIYPYX
			ZWSH	KASHI/Kashi			24 (30)	Ulan Bator	ZMUBYMYX
			ZWWW	URUMQI/Diwopu			24 (30)	Wellington	NZZZYPYAX
			ZYTL	DALIAN/Zhoushuizi			24		
			ZYTX	SHENYANG/Taoxian			24		
		FTCI32	ZGKL	GUILIN/Lianjiang	0535	0600	24	BANGKOK	VTBBYPYX
			ZGNN	NANNING/Wuxu	1135	1200	24	BRISBANE	YBBBYPYX
			ZGOW	*SHANTOU/Waisha*	1735	1800	24	NADI	NFFNYPYX
			ZGSZ	SHENZHEN/Baoan	2335	0000	24 (30)	SINGAPORE	WSZZYPYX
			ZLXY	XI'AN/Xianyang			24	TOKYO	RJTDYPYX
			~~ZMCK~~	~~ULAANBAATAR/Chinggis Khaan~~			~~30~~	Hong Kong	VHZZYPYX
			ZMUB	ULAANBAATAR/Buyant-Ukhaa			30	Jakarta	WIZZYPYX
			ZPPP	KUNMING/Wujiaba			24 (30)	Karachi	OPZZYPYX
			ZSAM	XIAMEN/Gaoqi			24	Kuala Lumpur	WMZZYPYR
			ZSFZ	FUZHOU/Changle			24	Mumbai	VABBYPYX
			ZSNB	*NINGBO/Lishe*			24	Wellington	NZZZYPYAX
			ZSQD	QINGDAO/Liuting			24		
			ZUUU	CHENGDU/Shuangliu			24		
		FTCI41	ZBHH	HUHHOT/Baita	0535	0600	24	BANGKOK	VTBBYPYX
			ZGHA	CHANGSHA/Huanghua	1135	1200	24	BRISBANE	YBBBYPYX
			ZHCC	*ZHENGZHOU/Xinzheng*	1735	1800	24	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	VABBYPYX
			ZUCK	CHONGQING/Jiangbei			24	Incheon	RKSIYPYX
			ZYCC	*CHANGCHUN/Longjia*			24	Ulan Bator	ZMUBYMYX

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

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			ZYHB	HARBIN/Taiping			24	Wellington	NZZZYPYX
Brisbane	**YBBN**	**FTAU31**	YPAD	ADELAIDE/Adelaide Intl	0235	0300	30	BANGKOK	VTBBYPYX
			YBBN	BRISBANE/Brisbane Intl	0535	0600	30	BRISBANE	YBBBYPYX
			YBCS	CAIRNS/Cairns Intl	0835	0900	24	NADI	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
			YMML	MELBOURNE/Melbourne Intl	2335	0000	30	Jakarta	WIZZYPYX
			YPPH	PERTH/Perth Intl			30	Manila	RPLLYPYX
			YSSY	SYDNEY/Sydney (Kingsford Smith) Intl			30	Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU32	YBAS	ALICE SPRINGS	0535	0600	24	BANGKOK	VTBBYPYX
			YMAV	*AVALON*	1135	1200	24	BRISBANE	YBBBYPYX
			YBWW	Brisbane West Wellcamp	1735	1800	24	NADI	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	VABBYPYX
			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		
		FTAU33	*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
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU34	*YBHM*	*HAMILTON ISLAND*	0500	0600	12	BANGKOK	VTBBYPYX
			YBMA	*MOUNT ISA*	1100	1200	12	BRISBANE	YBBBYPYX
					1700	1800		NADI	NFFNYPYX
					2300	0000		SINGAPORE	WSZZYPYX
								TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU35	*YCIN*	*CURTIN*	0100	0200	12	BANGKOK	VTBBYPYX
			YFRT	*FORREST*	0700	0800	12	BRISBANE	YBBBYPYX
			YPGV	*GOVE*	1300	1400	12	NADI	NFFNYPYX
			YPKU	*KUNUNURRA*	1900	2000	12	SINGAPORE	WSZZYPYX
								TOKYO	RJTDYPYX
								Beijing	ZBBBYPYX
								Hong Kong	VHZZYPYX
								Jakarta	WIZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTAU36	*YAMB*	*AMBERLEY*	0235 (M-F)	0300 (M-F)	24	BANGKOK	VTBBYPYX
			YPEA	*PEARCE*	0535	0600	18	BRISBANE	YBBBYPYX
			YPTN	TINDAL	1135	1200	24	NADI	NFFNYPYX
			YBTL	TOWNSVILLE/Townsville Intl	1735	1800	24	SINGAPORE	WSZZYPYX

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

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			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 1135 1735 2335	0600 1200 1800 0000	12	BANGKOK	VTBBYPYX
								BRISBANE	YBBBYPYX
								NADI	NFFNYPYX
								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
Hong Kong	**VHHH**	**FTHK31**	VHHH	HONG KONG/International	0235	0300	30	BANGKOK	VTBBYPYX
			~~RCTP~~	~~TAIBEI CITY/Taibei Intl Ap~~	0535	0600	~~30~~	BRISBANE	YBBBYPYX
			~~RCKH~~	~~GAOXIONG~~	0835	0900	~~30~~	NADI	NFFNYPYX
			~~RCSS~~	~~TAIBEI/Songshan~~	1135	1200	~~24~~	SINGAPORE	WSZZYPYX
			~~RCMQ~~	~~TAICHUNG/Qingquangang~~	1435	1500	~~24~~	TOKYO	RJTDYPYX
			~~RCNN~~	~~TAINAN~~	1735	1800	~~24~~	Beijing	ZBBBYPYX
			~~RCFN~~	~~TAIDONG/Fengnian~~	2035	2100	~~24~~	Mumbai	VABBYPYX
			~~VMMC~~	~~MACAOU/Intl Airport~~	2335	0000	~~30~~	Incheon	RKSIYPYX
			~~RPLL~~	~~MANILA/Ninoy Aquino Intl, Pasay City, Metro Manila~~			~~30~~	Wellington	NZZZYPYA~~X~~
			~~RPVM~~	~~LAPU-LAPU/Mactan, Cebu~~			~~30~~	London	EGZZMASI
			~~RPMD~~	~~DAVAO/Francisco Bangoy Intl, Davao Del Sur~~			~~24~~	Washington	KWBCYMYX
			~~RPLB~~	~~SUBIC BAY, Subic Bay Intl, Olongapo City, Zambales~~			~~24~~		
			~~RPMZ~~	~~ZAMBOANGA, Zamboanga Intl, Zamboanga Del Norte~~			~~24~~		
			~~RPLI~~	~~LAOAG, Laoag Intl, Ilocos Norte~~			~~24~~		
		FTHK32	VMMC	MACAO/Intl	0535	0600	30		
			RCTP	TAIBEI CITY/Taibei Intl	1135	1200	30		
			RCKH	GAOXIONG	1735	1800	30		
			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**	**FTKO31**	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

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

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			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
Karachi	**OPKC**	**FTPK31**	OPKC	KARACHI/Jinnah Intl	0535	0600	30	BANGKOK	VTBBYPYX
			~~OPRN~~ OPIS	~~ISLAMABAD/Chaklala~~ Islamabad International Airport	1135	1200	30	BRISBANE	YBBBYPYX
			OPLA	LAHORE/Allama Iqbal Int'l	1735	1800	30	NADI	NFFNYPYX
			OPNH	NAWABSHAH	2335	0000	30	SINGAPORE	WSZZYPYX
			OPPS	PESHAWAR			30	TOKYO	RJTDYPYX
			~~OPGD~~ *OPGW*	~~GWADAR~~ *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	OIIIYPYX
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
								Tehran	OIIIYPYX
		FTIN32	VIDP	DELHI/Indira Gandhi Intl	0535	0600	30		
			VEBN	VARANASI	1135	1200	30		
			VIAR	AMRITSAR	1735	1800	30		
			VIJP	JAIPUR	2335	0000	30		
			VILK	LUCKNOW			30		
		FTIN33	VECC	NETAJI SUBHASH CHANDRA BOSE INTERNATIONAL AIRPORT, KOLKATA	0535	0600	30		
			VEPT	PATNA	1135	1200	30		
			VEGY	GAYA	1735	1800	30		
			VEGT	GUWAHATI	2335	0000	30		
		FTSB31	VCBI	BANDARANAIKE INTL AP COLOMBO	0535	0600	30		
			VCRI	MATTALA RAJAPAKSA INTERNATIONAL AIRPORT	1135	1200	30		
					1735	1800			
					2335	0000			
		FTMV31	VRMG	GAN INTERNATIONAL AIRPORT	0535	0600	30		
			VRMH	HANIMAADHOO INTERNATIONAL AIRPORT	1135	1200	30		
			VRMM	MALE INTERNATIONAL AIRPORT	1735	1800	30		
					2335	0000			
Kolkata	**VECC**	**FTBW31**	VGEG	M.A. HANNAN INTL. CHITTAGONG	0535	0600	30		
			VGHS	HAZRAT SHAHJALAL INTERNATIONAL AIRPORT	1135	1200	30		
			VGSY	*OSMANI INTERNATIONAL AIRPORT,SYLHET*	1735	1800	30		
					2335	0000			
		FTAS31	VNKT	KATHMANDU	0535	0600	30		
					1135	1200			
					1735	1800			
					2335	0000			
Nadi	**NFFN**	**FTPS31**	NCRG	RAROTONGA INTL.	0535	0600	24	BANGKOK	VTBBYPYX
			NFFN	NADI/Intl	1135	1200	24	BRISBANE	YBBBYPYX
			NFTF	FUA'AMOTU INTL.	1735	1800	24	NADI	NFFNYPYX
			NFTV	VAVA'U	2335	0000	24	SINGAPORE	WSZZYPYX
			NGTA	TARAWA/Bonriki Intl			24	TOKYO	RJTDYPYX
			NIUE	NIUE Intl			24	Hong Kong	VHZZYPYX

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

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
			NVSS	SANTO/Pekoa			24	Wellington	NZZZYPYAX
			NVVV	PORT VILA/Bauerfield			24		
			PLCH	CHRISTMAS ISLAND			24		
			NFNA	*NAUSOR/Intl*			24		
			NSFA	FALEOLO/Intl			24		
		FTPS32	NLWW	WALLIS HIHIFO			24		
			NWWW	NOUMEA LA TANTOUTA			24		
		FTPS33	NTAA	TAHITI FAAA			24		
Singapore	**WSSS**	**FTSR31**	WSSS	SINGAPORE/Changi	0535	0600	30	BANGKOK	VTBBYPYX
			WSAP	PAYA LEBAR (RSAF)	1135	1200	30	BRISBANE	YBBBYPYX
			WSSL	SELETAR	1735	1800	30	NADI	NFFNYPYX
			WAAA	UJUNG PANDANG/Hasanuddin (Comm Center)	2335	0000	30	SINGAPORE	WSZZYPYX
			WABB	BIAK/Frans Kaisiepo			30	TOKYO	RJTDYPYX
			WADD	BALI/Ngurah Rai			24 (30)	Abu Dhabi	OMZZYPYX
			WARR	SURABAYA/Juanda			24	Bahrain	OBZZYPYX
			WIHH	JAKARTA/Halimperdana Kusuma			24	Beijing	ZBBBYPYX
			WIII	JAKARTA/Soekarno Hatta (COMM CENTER)			30	Beirut	OLLLYPYX
			WIMM	MEDAN/Polonia			24	Colombo	VCCCYPYX
								Hong Kong	VHZZYPYX
								Karachi	OPZZYPYX
								Manila	RPLLYPYX
								Mumbai	VABBYPYX
								Incheon	RKSIYPYX
								Tehran	OIIIYPYX
								Wellington	NZZZYPYAX
		FTSR32	WMKJ	JOHOR BAHRU/Sultan Ismail	0535	0600	24	BANGKOK	VTBBYPYX
			WMKK	SEPANG/KL International Airport	1135	1200	30	BRISBANE	YBBBYPYX
			WMKL	PULAU LANGKAWI/Intl	1735	1800	24	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
								Hong Kong	VHZZYPYX
								Manila	RPLLYMYX
								Mumbai	VABBYPYX
								Wellington	NZZZYPYX
		FTSR33	WBSB	BRUNEI/Intl	0535	0600	30		
			WBGB	*BINTULU*	1135	1200	24		
			WBGG	KUCHING/Intl	1735	1800	24		
			WBGR	*MIRI*	2335	0000	24		
			WBGS	*SIBU*			24		
			WBKK	KOTA KINABALU/Intl			24		
			WBKL	*LABUAN (RMAF)*			24		
			WBKS	*SANDAKAN*			24		
			WBKW	*TAWAU*			24		
Tokyo	**RJTD**	**FTJP31**	RJAA	NARITA Intl	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
								Incheon	RKSIYPYX
								Washington	KWBCYMYX
								Wellington	NZZZYPYAX

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

1 ROC		2 TAF Bulletin						3 Dissemination	
Name	**CCCC**		**CCCC**	**Aerodrome**	**Filing time**	**Start of validity**	**TAF validity**	**RODB/ROC**	**AFTN address**
		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	RKSIYPYX
								Karachi	OPZZYPYX
								London	EGZZMASI
								Mumbai	VABBYPYX
								Noumea	NWCCYMYX
								Saipan	PGSNYMYX
								Washington	KWBCYMYX
								Wellington	NZZZYPY~~A~~X
		FTJP38	*RJSA*	*AOMORI*	0525	0600	30	BANGKOK	VTBBYPYX
			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	~~24~~ 30*	BANGKOK	VTBBYPYX
			NZCH	CHRISTCHURCH Intl	0535	0600	~~24~~ 30*	BRISBANE	YBBBYPYX
			NZWN	WELLINGTON Intl	0835	0900	~~24~~ 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 shorted than indicated.*					
		FTNZ32	NZQN	Queenstown	1130	1200	18		
					1730	1800			

APPENDIX C - IROG Back-up Procedures

1. Introduction

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

APPENDIX D - Use of WMO Abbreviated Heading

(For use in ROBEX Messages and Bulletins)

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

$T_1T_2A_1A_2$ii CCCC YYGGgg (BBB)

2. Explanation of the symbols

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

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

Data type	Abbreviated name	WMO data type designator	
		TAC	IWXXM
Aerodrome reports	METAR SPECI	SA SP	LA LP
Aerodrome forecasts	TAF: 12 to 30 hour	FT	~~LC~~ 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_1A_2** - Geographical designator, composed of two letters, according to WMO No. 386, Manual on the Global Telecommunication System, Part II – Operational Procedures for the GTS, Attachment II-5, Table C1. The following principles shall apply:

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

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

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

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

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

c) For ROBEX bulletins containing SWX Advisories from the designated SWXCs, the A_1A_2 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 **$T_1T_2A_1A_2$ii CCCC** designators used, based on SWX impact type [ii], SWXC originator location indicator [CCCC], and data type/message form [T_1T_2], are as follows:

SWXC	SWX impact	$T_1T_2A_1A_2$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
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 VOCI 170900Z 1712/1818 29005KT 4000 -RA/HZ SCT015 SCT020 FEW025CB BKN100 BECMG 1716/1717 3000 -RA/HZ TEMPO 1712/1721 1500 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1804/1805 30005KT 4000 HZ BECMG 1806/1807 27010KT 5000 -RA/HZ TEMPO 1809/1815 1500 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1816/1817 3000 HZ=
TAF VOCL 170900Z 1712/1818 33005KT 4000 -RA/HZ SCT015 SCT020 FEW025CB BKN100 BECMG 1716/1717 3000 -RA/HZ TEMPO 1712/1721 2000 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1804/1805 35005KT 5000 HZ BECMG 1806/1807 32010KT 5000 -RA/HZ TEMPO 1809/1815 2000 TSRA/SHRA SCT008 SCT012 FEW025CB OVC080 BECMG 1816/1817 3000 HZ=
TAF VOHS 170900Z 1712/1818 27010G20KT 6000 SCT020 SCT100 TEMPO 1712/1718 3000 -TSRA/RA SCT015 FEW025CB BKN080 TEMPO 1721/1803 3000 -TSRA/RA/HZ SCT015 FEW025CB BKN080 TEMPO 1809/1818 3000 -TSRA/RA SCT015 FEW025CB BKN080=
TAF VOHY 170900Z NIL=

TAF VOMM 170900Z 1712/1818 17010KT 6000 SCT020 BKN100 TEMPO 1712/1718 SCT015 FEW025CB BKN100 BECMG 1720/1721 21010KT SCT020 BECMG 1803/1804 27010KT 8000 FEW020 SCT100 BECMG 1810/1811 13010KT TEMPO 1812/1815 SCT015 FEW025CB BKN100 BECMG 1813/1814 6000=
TAF VOTR 170900Z 1712/1818 27010KT 6000 SCT020 SCT100 TEMPO 1712/1715 SCT015 FEW025CB BKN100 BECMG 1716/1717 33005KT FEW020 BECMG 1803/1804 27010G20KT 8000 FEW020 SCT250 BECMG 1812/1813 27005KT 6000 TEMPO 1812/1815 SCT015 FEW025CB BKN100=

Second Part

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

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

1. METNO Procedure – General rules

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

1.1.1. The regional FP or regional Team verifies the conformity of the change proposal against ICAO 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. In addition, separated bulletins will be produced for AOP airport and agreed exchanged non-AOP airports OPMET data.

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

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

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

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

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

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

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

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

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

1.11. For urgent modification, it can be decided with the explicit agreement of the regional METNO focal point/regional team to proceed more quickly by a deviation to the normal schedule. The FP/regional team will compile AIRAC METNO, or EXTRA METNO for intermediate updates with immediate implementation of new or expiring bulletins.

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

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

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

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

2. Format and Content of the METNO-message

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

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

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

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

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

2.3.1. ADDRPT

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

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

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

2.3.2. RMVRPT

2.3.2.1. This statement is used for METARs/TAFs planned to be removed from an already registered bulletin. Removed reports can possibly be registered for all 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.

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

2.3.3. NEWBUL

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

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

2.3.4. DELBUL

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

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

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

3. METNO Focal Point – Prerequisites and Actions

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

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

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

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

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

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

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

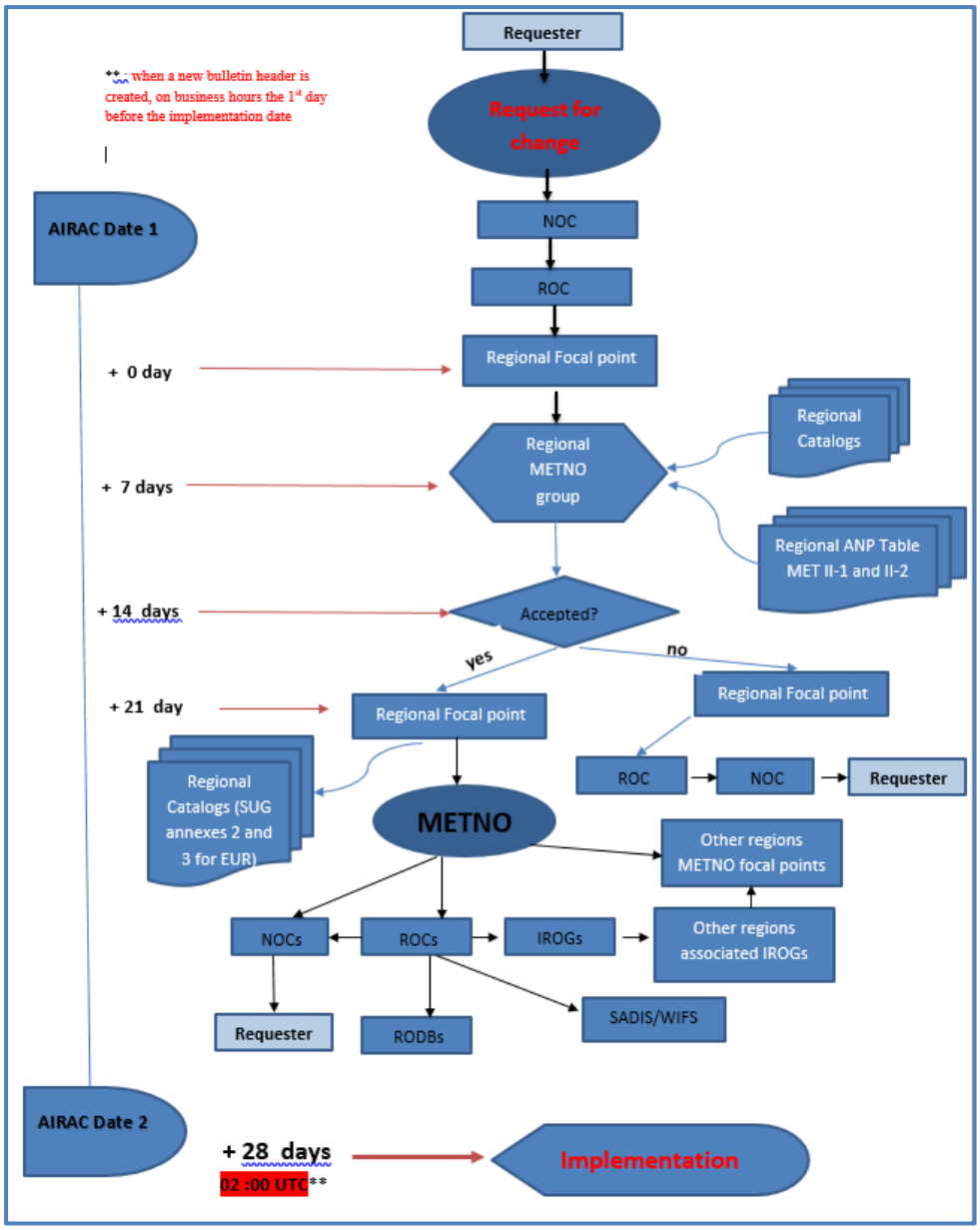
3.6. Maintenance of regional METNOs and registered OPMET data.

3.7. Reports to OPMET regional group.

3.8. Facilitates OPMET data monitoring.

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

4. METNO Process Diagram



APPENDIX F - OPMET Quality Control and Monitoring Procedures

1 Quality Control Procedures

1.1 *OPMET Data Validation*

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

1.1.2 WMO Abbreviated Heading (TTAAii CCCC YYGGgg BBB) Validation

TT	Message Type; shall comprise two alphabetical characters
AA	Location Indicator; shall comprise two alphabetical characters
ii	comprise two digits, from 01 to 99
CCCC	A 4-letter ICAO location indicator shall comprise 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 **UTC** VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =	 SABM31 VYMD **100830** VYMD 100830Z 18005KT 8000 FEW025 31/18 Q1000 =
TAF without AHL: 112324 WIDDYMYX TAF WIDD 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=	 **FTID31 WIDD 112300** TAF WIDD 112324Z 1200/1224 00000KT 4000 RA BKNT017 BECMG 1203/1205 20010KT 9000 SCT017=
TAF with invalid BBB: FTBN31 OBBI 030525 **AMD** TAF AMD OBBI 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=	 FTBN31 OBBI 030525 **AAA** TAF AMD OBBI 030525Z 0306/0406 16010KT CAVOK BECMG 0308/0312 33017KT 5000 PROB30 TEMPO 0308/0314 0800 DU=

1.1.3 METAR/SPECI Validation

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

Prefix checks	METAR METAR COR SPECI SPECI COR	SA SA SP SP
Observation Time YYGGggZ	The report shall have a valid date and time of observation, including the character 'Z'. In a SPECI bulletin, this group will be 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 **<u>030159</u>** RRA OPKC **030200** 26004 8000 BKN020 27/23 Q1007 NOSIG=	 SAPK31 OPKC **<u>030200</u>** RRA OPKC **030200** 26004 8000 BKN020 27/23 Q1007 NOSIG=
METAR with mistyped observation time: SAID31 WADD **<u>120100</u>** METAR WADD **<u>121000Z</u>** 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=	 SAXX31 WADD **120100** METAR WADD **<u>120100Z</u>** 17004KT 9999 FEW018CB SCT120 BKN300 28/26 Q1005=
SPECI with incorrect Message Type, TT: **<u>SANZ31</u>** NZKL 040000 **<u>SPECI</u>** NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG=	 **<u>SPNZ31</u>** NZKL 040000 AAA **<u>SPECI</u>** NZWP 040000Z 17005KT 010V240 25KM FEW020 FEW020CB SCT035 BKN050 18/15 Q1018 NOSIG=

1.1.4 <u>TAF Validation</u>

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

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

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

1.1.5 SIGMET Validation

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

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

1.2 Quality Control Methods

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

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

2 OPMET Monitoring

2.1 Monitoring of Scheduled OPMET data

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

(i) Compliance Index

The ROBEX Compliance index can be calculated from:

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

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

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

Explanation:

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

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

Procedure:

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

Example 1:

Bulletin SAIN33 includes six aerodromes (VECC, VEPT, VGEG, VGHS, VNKT and VQPR). For each aerodrome, the number of reports required for a bulletin equals 2*24 = 48 reports. Because the official observation time of the bulletin is at every hour and half-hour (i.e., HH+00 and HH+30), resulting in two reports for each of the 24 hours in each day**.** If only on the 2nd of March, the RODB does not receive reports from one aerodrome. Calculate the compliance index for Bulletin SAIN33 in March.

Answer:

No. of reports received for a bulletin
= (6 aerodromes*48 reports*30 days)+(5 aerodromes*48 reports*1 day)
= 8,640+240
= 8,880
No. of reports required for a bulletin
= (6 aerodromes*48 reports*31 days) = 8,928
March compliance index = 8,880/8,928 = 0.9946

(ii) Availability Index

The availability index measures the current coverage of the OPMET distribution against the ROBEX exchange requirements. The determination of the availability index is performed on a daily basis from the data captured during the monitoring period. If at least one non-NIL report is received from the aerodrome during the 24-hour period, that aerodrome is considered to have

been available. The daily availability index of a particular bulletin can be calculated as:

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

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

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

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

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

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

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

Procedure:
1. For each day or the period of 24 hours, obtain the number of aerodromes required in the bulletin.
2. For each day or the period of 24 hours, run through the aerodromes within each bulletin. Count the numbers of reports received from each aerodrome that contain Non-NIL data type. If the number exceeds zero, then that aerodrome receives one point, else zero points. Add up the points of each aerodrome to obtain the number of aerodromes for which one or more non-NIL data type is received.
3. For each day, calculate the availability index by taking the ratio of the number of aerodromes for which one or more non-NIL data types are received (calculated in 2.) and the number of aerodromes required in the bulletin (calculated in 1.).
4. To calculate the monthly availability index, add up the daily availability index (calculated in 3.) of all the days in a month and divide by the number of days in the month, e.g., 6/6+6/6+6/6+5/6+4/6+6/6+.....+2/6 => (31 elements for 31 days).

5. Alternatively, to calculate the monthly availability index, add up the number of aerodromes for which one or more non-NIL data types are received (calculated in 2.) for all the days in a month and divide by the number of aerodromes required in the bulletin (calculated in 1.) in that month.

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

(iii) Regularity Index

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

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

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

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

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

The **threshold** is the number of reports provided by the aerodrome, which is considered "regular." This number is defined by calculating the statistics (mean and standard deviation) of the number of reports provided by the aerodrome within a time frame, e.g., six months, one year, or five years.

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

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

Procedure:

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

Example 3:
Bulletin SAIN33 continued from example 1.

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

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

2.2 Monitoring of non-scheduled OPMET data

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

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

2.2.3 Example non-routine OPMET monitoring result file formats:

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

Explanation of the table:

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

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

2.2.4 Analysis of Monitoring Results:

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

2.3 Examples of Monitoring Results – PI Measurements

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

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

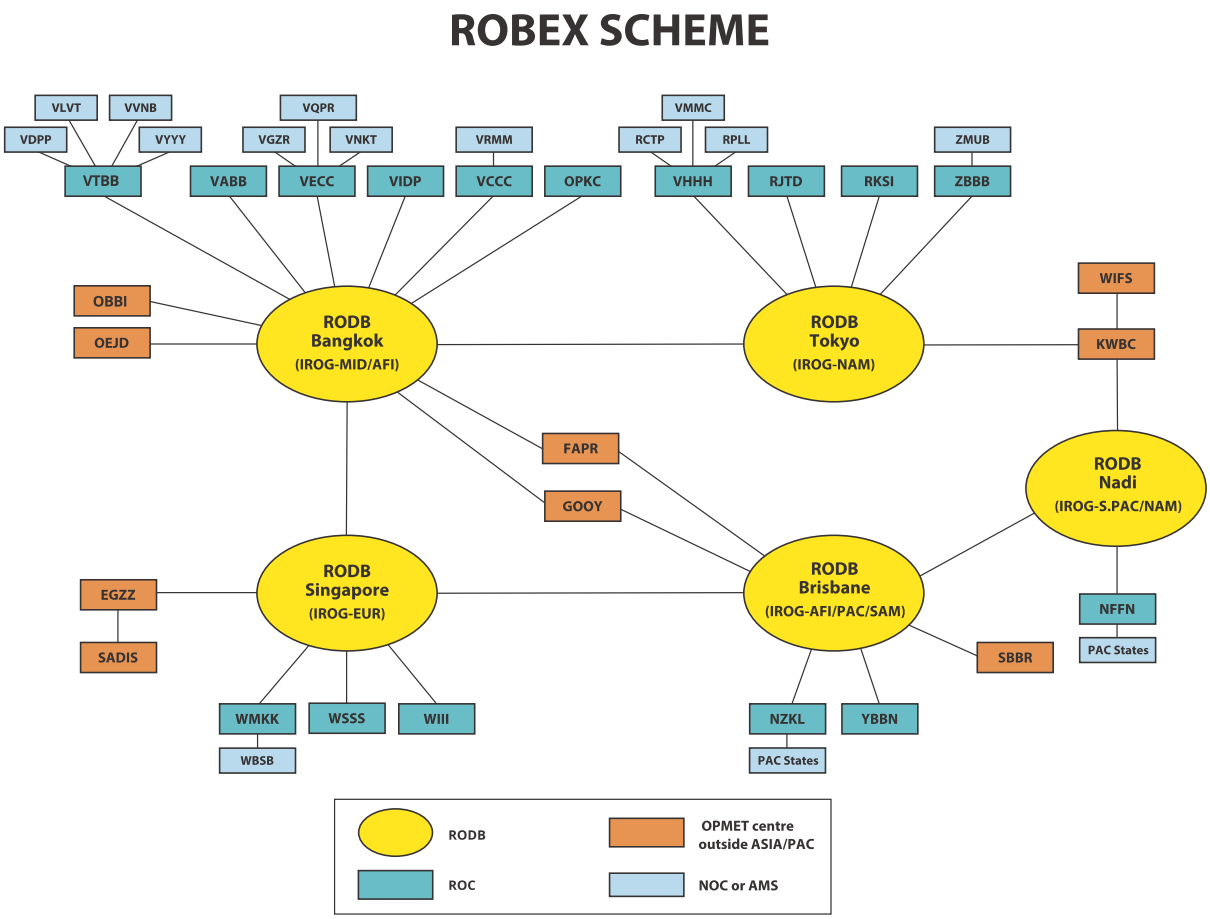
Note: *Entry dashed out (--) means no reports of this type (SA or FT) are required*

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

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

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

APPENDIX G - ROBEX Scheme Diagram



APPENDIX H – RODB OPMET Interrogation Procedures

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

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

REQUEST/REPLY MESSAGE FORMAT

1. Request messages

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

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

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

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

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

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

1.3.1 In the AFTN heading:

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

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

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

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

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

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

1.3.5 **Examples of request types**

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

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

RQM/TTCCCC=

Examples:

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

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

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

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

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

Examples:

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

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

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

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

Examples:

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

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

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

RQM/TT$_1$CCCC,CCCC,…/TT$_2$CCCC,CCCC,…/...../TT$_n$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)

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: tim.hailes@bom.gov.au, sral@bom.gov.au
	Mr. Pierre Kemmers AIS Business Manager Airservices Australia GPO Box 367 Canberra ACT 2601	Tel: +61 2 6268 4426 e-mail: pierre.kemmers@airservicesaustralia.com (primary) / YBBBYPYX@airservicesaustralia.com (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: zoujuan@atmb.net.cn
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: hhlam@cad.gov.hk
	Mr. B.L. Choy Hong Kong Observatory	Tel : +852 2926 8350 Fax : +852 2311 9448 e-mail : blchoy@hko.gov.hk
FIJI	Mr. William L. REECE Aeronautical Technical Officer – ATM Airports Fiji Limited P.O. Box 9210 Nadi Airport	Tel: +679 (6) 731198 Fax: +679 e-mail: williamr@afl.com.fj
INDIA	Shri Gajendra Kumar Scientist-E India Meteorological Dept. New Delhi	Tel: +91 (11) 2462 5547 Fax: +91 (11) 24615371 e-mail: gkumarimd@gmail.com; gajendra71.kumar@imd.gov.in
	Administration units OPMET/ROBEX	
	Director General of Meteorology India Meteorological Department Lodi Road, New Delhi – 110 003 India	

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
INDONESIA	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	Tel : +62 (21) 4246321 Fax : +62 (21) 6546315 e-mail: herlina@bmkg.go.id; herlina_270963@yahoo.com
	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) 424 6321 Fax : +62 (21) 6546315 e-mail : fenypermatasari@bmkg.go.id; fenypermatasari@gmail.com
JAPAN	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: k-tsuboi@met.kishou.go.jp
MALAYISIA	~~Dr. Mohd Hisham Bin Mohd Anip~~ Mr. Muhammad Nazri Noordin ~~Senior Director~~ Principal Assistant Director of National Aviation Meteorological Centre ~~Pejabat Meteorologi Penerbangan Nasional~~ ~~Tingkat 1, Bangunan Pusat Pentadbiran~~ ~~1st Floor, Airport Management Centre~~ ~~Kuala Lumpur International Airport~~ ~~64000 Sepang, Selangor~~ ~~Darul Ehsan~~ Malaysian Meteorological Department	Tel: +60 (3) 8787~~3360~~ 2161 Fax: +60 (3) 87871019~~/20~~ e-mail: mnazri@met.gov.my; ~~tehvakumari@met.gov.my~~
	Administration units OPMET/ROBEX	
	~~Mr. Lim Ze Hui~~ Dr. Chai Mui Fatt Principal Assistant Director of Sabah Weather and Earthquake Operation Centre Sabah, Tingkat 7, Wisma Dang Bandang 8800 Kota Kinabalu Sabah Malaysian Meteorological Department	Tel: +60 (88) ~~256054~~ 413340 Fax: +60 (88) ~~211019~~ 413696 e-mail: ~~zhlim@met.gov.my~~ chai@met.gov.my
MONGOLIA	Mr Banidsuren Byambaa Director of Aviation Meteorological center, National Agency for Meteorology and Environment Monitoring, Mongolia 17120 Buyant-Ukhaa, Khan-Uul district, Ulaanbaatar,Mongolia	Tel: +976 71285024 Fax: +976 70049869 e-mail: amc@namem.gov.mn

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
NEW ZEALAND	Ms. Paula Acethorp Chief Meteorological Officer Civil Aviation Authority of New Zealand PO Box 3555 Wellington 6140 NEW ZEALAND	Tel: +64 4 830 2611 e-mail: paula.acethorp@caa.govt.nz
PAKISTAN	~~Mr. Abdul Sattar Bhutto (27 Nov. 19)~~ ~~Senior Joint Director Com Ops.~~ Mr Shamsuddin Hakro Addtional Director Com Ops Communication Operations Branch Operations Directorate Terminal 1, HQ CAA JIAP Karchi ***Administration units OPMET/ROBEX*** Senior Joint Director Communication Operations Branch Operations Directorate Terminal 1, HQ CAA JIAP Karchi Mr. Akhlaq Ahmed Senior Meteorologist Meteorological Office Room No. 3106 JTC, Jinnah International Airport Karachi ***Administration units OPMET/ROBEX*** Main Meteorological Office Jinnah International Airport Karachi	Tel: +92 (21) 9907 2~~428~~ 351 Fax: +92 (21) 9924 2187 e-mail: adld.comops@caapakistan.com.pk Tel: +92 (21) 9907 1300 +92 (21) 9907 1302 Fax: +92 (21) 9924 8282 e-mail: pmdmmokarachi@gmail.com
PAPUA NEW GUINEA	Mr. Tau Gabi National Weather Service Port Moresby PNG	Tel: Fax: e-mail: tgabi@png.met.gov.pg
REPUBLIC OF KOREA	Mr. Kim 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 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	Tel: +82 (32) 222 3030 Fax: +82 (32) 740 2807 e-mail: av_pod@korea.kr; kyh13@korea.kr Tel: +82 (32) 222 3030 Fax: +82 (32) 740 2807 e-mail: dwlee5@korea.kr

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
	Administration units OPMET/ROBEX Aviation Meteorological Office of Korea Meteorological Administration (AMO/KMA) 444 Je2terminal-daero, Jung-gu Incheon, 22382 (Location Indicator : RKSIYPYX)	
SINGAPORE	Mr. ~~**Wong** Songhan~~ **Chiam** Keng Oon Senior Meteorologist, Meteorological Service Singapore, P.O. Box 8 Singapore Changi Airport Singapore 918141	Tel: +65 ~~6546 2934~~ 6244 6133 Fax: +65 6542 5026 e-mail: ~~wong_songhan@nea.gov.sg~~ chiam_keng_oon@nea.gov.sg
	Mr. **Goh** Wee Poh ~~Senior Meteorologist~~ Head, Customer Services Meteorological Service Singapore, P.O. Box 8, Singapore Changi Airport, Singapore 918141 SINGAPORE	Tel: +65 6542 9224 Fax: +65 6542 5026 Email: goh_wee_poh@nea.gov.sg
	Administration units OPMET/ROBEX Central Forecast Office/Weather Services ~~Department~~ Division P.O. Box 8 Singapore Changi Airport Singapore 918141	
SRI LANKA	Mr. E. S. Silva Meteorologist in charge Katunayake International Airport Colombo Sri Lanka	Tel: +94 11 2252721 Fax: +94 11 2252319 e-mail: meteo3@sltnet.lk
THAILAND	~~Ms. Sujin Promduang~~ Mr. Bunpot Kujaphun Director, Aeronautical Information and Flight Data Management Centre Aeronautical Radio of Thailand Ltd., 102 Soi Ngamduplee, Tunkmahamek Sathorn, Bangkok 10120	Tel: +66 (2) 2859083 Fax: +66 (2) 2878~~645~~ 538 e-mail: ~~sujin@aerothai.co.th~~ bunpot.ku@aerothai.co.th
	~~Mr. Somchai Yimsricharoenkit~~ ~~Head of Aeronautical Meteorology~~ ~~Civil Aviation Authority of Thailand~~ ~~333/105 Lak Si Plaza~~ ~~Khamphaeng Phet 6 Road~~ ~~Talat Bang Khen, Lak Si~~ ~~Bangkok 10210~~ Mr. Wanchalearm Petsuwan Computer Technical Officer Thai Meteorological Department 4353 Sukhumvit Road Bangna, Bangkok 10260	Tel: +66 (2) ~~568 8825~~ 399 4596 Fax: +66 (2) ~~568 8847~~ 744 6240 e-mail: ~~somchai.y@caat.or.th~~ wpetsuwan@hotmail.com

State/ ADMINISTRATION	NAME/DESIGNATION AND ADDRESS	Tel/Fax/e-mail
USA	Mr. ~~Walter Smith~~ Michael Graf National Weather Service	Tel: +1 (301) 427 9~~618 Ext. 139~~109 Fax: +1 (301) 713 1~~409~~520 e-mail: ~~Walter.Smith@noaa.gov~~ michael.graf@noaa.gov
	~~Mr. Michael (Pat) Murphy~~ ~~Federal Aviation Administration~~	~~Tel: +1 (202) 267 2788~~ ~~e-mail: michael.murphy@faa.gov~~
	Karen Shelton-Mur Federal Aviation Administration	Tel: +1 (202) 267 7985 e-mail: Karen.shelton-mur@faa.gov