INTERNATIONAL CIVIL AVIATION ORGANISATION

REPORT OF THE TWENTIETH MEETING OF THE METEOROLOGICAL INFORMATION EXCHANGE WORKING GROUP (MET/IE WG/20)

(Online, 28 – 30 March 2022)

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

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HISTORY OF THE MEETING

1. Dates and venue

1.1. The ICAO Asia and Pacific (APAC) Regional Office hosted the Twentieth Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/20) online from 28 to 30 March 2022.

1.2. The final day of the Meeting, 30 March 2022, included a conjoint session with the Twelfth Meeting of the Meteorological Services Working Group (MET/S WG/12) to jointly discuss agenda items relevant to both the MET/IE WG and MET/S WG.

2. Attendance

2.1. One hundred and twenty (120) participants registered their attendance at the Meeting from twenty-two (22) States/Special Administrative Regions and two (2) International Organizations, including Australia, Bhutan, China, Hong Kong China, India, Indonesia, Japan, Lao People's Democratic Republic, Macao China, Malaysia, Maldives, Mongolia, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United States, Viet Nam, and IFALPA and ICAO. The list of participants is in **Appendix C** to the 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.

3.2. 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 nine (9) Working Papers (WPs) and eleven (11) Information Papers (IPs) in the first two days of the Meeting, and an additional three (3) WPs and two (2) IPs in the conjoint session between MET/IE WG/20 and MET/S WG/12. The list of papers is in **Appendix D** to the Report.

5. Outcomes

5.1. The Meeting did not record any 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, in accordance with 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. In addition, the Meeting agreed to eighteen (18) new action items, including four (4) from the conjoint session, as indicated throughout the *Report on Agenda Items* below and presented in the *List of Actions* in **Appendix A** to this Report.

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REPORT ON AGENDA ITEMS – MET/IE WG/20

1. Organisational matters

WP/01 – Provisional Agenda (Secretariat)

1.1. The Meeting adopted the agenda as listed below:

MET/IE WG/20 (28 – 29 March 2022)
Agenda Item 1: Organisational matters
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/20 and MET/S WG/12 (30 March 2022)
Agenda Item 1: Volcanic ash advisory centre (VAAC) backup tests
Agenda Item 2: SIGMET tests

2. Review of follow-up from previous meetings

WP/02 – FOLLOW-UP ACTION FROM MET/IE WG/19 (Secretariat)

2.1. The Secretariat presented the status of follow-up action on outcomes from MET/IE WG/19, including the unresolved action items from previous meetings of the MET/IE WG, and proposed updates to the follow-up status on the action items as indicated in Appendix A to WP/02.

2.2. Regarding several action items indicated in WP/02 as being "completed" by the updates in the APAC Regional OPMET Bulletin Exchange (ROBEX) Handbook, 14th Edition, the Secretariat advised the Meeting that ICAO would send a State letter advertising the publication of the ROBEX Handbook, 14th Edition, as soon as possible after the end of the Meeting.

2.3. The Meeting requested the Secretariat to follow up with Cambodia on the unresolved action item 17/1 concerning SIGMET service for the Phnom Penh Flight Information Region (FIR), which required: a) changes to the routing of the SIGMET and advisory information at the responsible VAAC, Tropical Cyclone Advisory Centre (TCAC), and the Regional OPMET Data Banks (RODBs); and b) updates to the ICAO APAC Air Navigation Plan (ANP), including the legacy FASID* tables, and the Regional SIGMET Guide, as soon as possible.

2.4. China informed the Meeting that the unresolved action item 17/4, concerning updating the ROBEX Handbook to reflect the regular exchange of several international OPMET bulletins to the Regional OPMET Centre (ROC) Beijing, was in progress. Furthermore, China had consulted with the States concerned. Accordingly, the Meeting requested the Secretariat to take the lead in coordinating

* (Air Navigation Plan) Facilities and Services Implementation Document

the preparation of appropriate updates to the ROBEX Handbook and agreed to reflect this in the List of Actions.

2.5. Rather than consider the unresolved action items 01, 07, and 17/13 as being superseded by related activities in the MET/IE WG work plan, as proposed by the Secretariat, the Meeting preferred to retain the "in progress" status of the above action items in the List of Actions until all the follow-up action is completed.

2.6. The Meeting noted that the MET/IE WG interim progress reports (by the Chair and Secretariat) would update the due dates assigned to unresolved action items to maintain achievable and relevant timeframes in the List of Actions, and identify a lead for each action item (where this is not already included in the List).

2.7. Updated action items' status, agreed upon by the Meeting, are provided in the List of Actions in **Appendix A** to the Report.

WP/03 – FOLLOW-UP ACTION FROM MET SG/25 (Secretariat)

2.8. The Secretariat presented the status of follow-up action on outcomes from the Twenty-Fifth Meeting of the Meteorology Sub-group (MET SG/25), including The Conclusions and Decisions adopted by MET SG/25, in Appendix B to WP/03, and the MET SG/25 action items, in Appendix C to WP/03.

2.9. Regarding the MET SG action item 25/13: *Coordinate possible space weather (SWX) advisory exercise/s and training workshop/s with the appropriate body under METP*, the Secretariat informed the Meeting that ICAO would include in its 2022 program an APAC webinar on space weather information service (date to be decided in Q3/Q4 2022).

2.10. In addition, Australia advised the Meeting that it, in collaboration with New Zealand, was developing a plan to run a Space Weather Exercise in 2022. There may be opportunities to combine the ICAO and Australian activities. It was agreed that the Secretariat would follow up with Australia on this matter. **[MET/IE WG/20 - ACTION 01]**

WP/04 – FOLLOW-UP ACTION FROM APANPIRG/32 (Secretariat)

2.11. The Secretariat presented the status of follow-up action on outcomes from the Thirty-Second Meeting of the Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/32) in Appendix A to WP/04.

2.12. In addition, WP/04 informed the Meeting that, to address the concerns reported by MET SG/25 (to APANPIRG/32) about the negative impact of delayed Secretariat actions on the MET SG work plan, the Secretariat informed APANPIRG/32 it is considering the possibility of advertising for the secondment of an Aviation Meteorology subject matter expert to supplement the Secretariat support for the APANPIRG MET-related work.

2.13. Regarding the Conclusion APANPIRG/32/11: *Updating Online Register of IWXXM[†] Exchange Status* (based on Draft Conclusion MET SG/25-03), the Meeting noted that IP/09, to be discussed under agenda item 4, would discuss updates on the implementation status of IWXXM exchange as provided in the online register of IWXXM exchange status.

[†] ICAO Meteorological Information Exchange Model

2.14. The Chair highlighted Decision APANPIRG/32/12: *Meteorological expert contribution to SWIM TF*[‡] (based on Draft Decision MET SG/25-08) and invited the Meeting members to encourage their States to nominate relevant meteorological (MET) experts for SWIM TF/6[§], scheduled online from 17 – 20 May 2022.

2.15. In addition, the Meeting considered the possibility of including at future MET/IE WG meetings an agenda item dedicated to APAC SWIM MET aspects.

2.16. The Chair noted WP/04 did not discuss the APANPIRG/32 outcome[**] concerning the Draft-Conclusion MET SG/25-07. However, the Chair informed the Meeting he was disappointed with the APANPIRG/32 handling of Draft-Conclusion MET SG/25-07: *SWIM architecture to enable the cost-effective and efficient provision and consumption of MET information services*.

Publication of Secretariat working papers

2.17. The Chair advised the Meeting that he was disappointed the Secretariat had not published the Secretariat's working papers fourteen days or more before the Meeting, as stipulated in the updated[††] MET/IE WG terms of reference. The Meeting recalled that MET/IE WG had requested the updates (in the terms of reference) to support the participants' effective consideration of information and proposals submitted in meeting papers.

3. Meteorological information exchange schemes

IP/02 – TO INPUT VVVD INTO ROBEX SCHEME TO FACILITATE INTERNATIONAL FLIGHT OPERATIONS (Vietnam)

3.1. In 2019, Vietnam commenced international flight operations at QUANG NINH/Van Don International Airport (with ICAO location indicator VVVD), including providing MET services at the airport in compliance with ICAO standards and recommended practices.

3.2. In addition, to document the assignment of responsibilities to Vietnam for providing the aerodrome facilities and services, Vietnam initiated the necessary amendment to the ANP, Volume I, Table AOP I-1 – *International Aerodromes Required in the Asia/Pacific Regions*. Furthermore, following ICAO's provisions for aeronautical information, Vietnam published the required details of the airport, including the MET services, in the Aeronautical Information Publication (AIP) Vietnam.

3.3. However, to facilitate the global availability of the MET information for international civil aviation, details of the MET service provided at the airport also need to be incorporated into the ROBEX scheme.

3.4. The Meeting noted that Vietnam had completed the steps for changes to OPMET bulletins described in the ROBEX Handbook. In addition, the MET/IE WG member from Thailand confirmed that RODB Bangkok was ready to issue the required METNO[‡‡] message.

[‡] System-Wide Information Management (SWIM) Task Force
[§] Registration online at https://www.icao.int/apac
[**] Relevant extracts from the Final Report of APANPIRG/32 are provided in Attachment 1 to the (MET/IE WG/20) Report
[††] Adopted in response to MET/IE WG/18, action item 02
[‡‡] Ref: ICAO APAC ROBEX Handbook, APPENDIX E – *Procedure and Format of METNO bulletin for APAC ROBEX Bulletins*

3.5. Given the discussion above, the Meeting requested the Secretariat coordinate with Vietnam on the consequential amendments to reflect the requirements for MET service at QUANG NINH/Van Don International Airport (ICAO location indicator VVVD) in the ANP (Volume II, Table MET II-2 – *Aerodrome Meteorological Offices*) and the ROBEX Handbook. **[MET/IE WG/20 - ACTION 02]**

4. Meteorological information exchange in digital form

WP/06 – INCLUSION OF TAF EXTENSIONS IN IWXXM TAF BULLETINS (Australia)

4.1. In compliance with ICAO Annex 3 – *Meteorological Service for International Air Navigation*, Australia disseminates aerodrome forecasts (TAFs) in traditional alphanumeric code (TAC) and IWXXM forms. In addition, to meet the local users' specific needs for flight planning and fuel-related flight regulations, the TAFs disseminated in TAC form contain additional parameters (of which Australia has notified ICAO).

4.2. Given the significant benefits of the additional TAF parameters to users, Australia has developed the capability to disseminate the following additional parameters in its IWXXM-formatted TAFs using a TAF IWXXM extension (as enabled by the ICAO *Guidelines for the Implementation of OPMET Data Exchange Using IWXXM*):

- four temperature parameters (at T+3, T+6, T+9, T+12);
- four QNH parameters (at T+3, T+6, T+9, T+12);
- support for INTER; and
- a TAF3 boolean parameter, which indicates whether the TAF is routinely generated at a 3- or 6-hourly frequency.

4.3. However, before implementing the above change to its TAFs disseminated for international civil aviation users, Australia wanted to seek out any concerns from members of the APAC region, including participants of the ROBEX scheme.

4.4. The member from Australia reminded the Meeting that the extensions in IWXXM-formatted messages enabled the provision of additional information to users unambiguously, which the existing TAC-formatted MET messages cannot deliver.

4.5. The Chair informed the Meeting that the ICAO Meteorology Panel (METP), Working Group on Meteorological Information Exchange (WG MIE), is developing a process for managing IWXXM extensions, including an approach for reporting changes to users and possibly a global repository for IWXXM extension information.

4.6. Regarding the inclusion of extensions in IWXXM-formatted TAF bulletins (as discussed in WP/06), the member from Australia indicated that Australia would consider sending test messages (with TAF IWXXM extensions) to other States to help identify any concerns or risks. Members from Hong Kong China and New Zealand agreed to participate in the test and any additional States willing to participate should contact the Member from Australia.

4.7. In a related discussion, the Chair informed the Meeting that the METP was also developing a process to evaluate IWXXM extensions and consider whether an extension's content should be integrated into the core global IWXXM schema as optional content. However, the Chair also noted that, unless there is a significant safety case for changes[§§], ICAO will not engage in any similar, further development of TAC-formatted TAF (or other OPMET).

[§§] ICAO METP, Recommendation 8/1 — *Traditional Alphanumeric Code*

IP/03 – UPDATES ON THE IMPLEMENTATION OF IWXXM IN JAPAN (Japan)

4.8. Japan informed the Meeting of its current status on IWXXM implementation and AMHS/FTBP[***] connection with other States. Furthermore, the Meeting noted Japan started dissemination and receipt of IWXXM information in March 2022.

4.9. In addition, the member from Japan informed the Meeting that Japan's IWXXM exchange tests with ROCs had revealed that its IWXXM messages were exchanged with multiple body parts. Therefore, Japan was investigating this problem.

IP/04 – STATUS AND PLANS FOR IMPLEMENTATION OF IWXXM IN THAILAND (Thailand)

4.10. Thailand's NOC, hosted by the Thai Meteorological Department (TMD), performs translation of Thailand's OPMET from TAC to IWXXM (Version 3.0) and transmits the IWXXM data, using AMHS with FTBP, to the Bangkok ROC, which is hosted by AEROTHAI.

4.11. ROC Bangkok transmits international IWXXM reports to Thailand's NOC, and disseminates IWXXM data internationally from other NOCs in its area of responsibility under the ROBEX scheme to ROC Hong Kong and RODBs Singapore and Brisbane. Commencing in May 2022, Thailand will upgrade its communication network to the CRV to support the exchange of IWXXM reports with other NOCs, ROCs and RODBs.

4.12. ROC Bangkok provides a translation service, currently for Vietnam, for METAR/SPECI and TAF from TAC to IWXXM (Version 3.0). The AMHS with FTBP protocol is expected to be deployed between Bangkok COM Centre and Vietnam COM Centre in the 3rd quarter of 2022.

4.13. RODB Bangkok provides the capability for users to request IWXXM (as well as TAC) data.

4.14. Thailand plans to establish its AMSs, AMOs and MWO as "IWXXM Producers" during 2023-2027. It also plans to establish bilateral agreements to provide translation services for other States in ROC Bangkok's area of responsibility under the ROBEX scheme.

4.15. In addition, the member from Thailand advised the Meeting that Thailand planned to test the exchange of IWXXM with Inter-Regional OPMET Gateways (IROGs) from other regions, in particular IROG Jeddah (Saudi Arabia) and IROG Johannesburg (South Africa). Thailand sought contact details from the Secretariat for these IROGs so that Thailand could discuss their support for IWXXM and AMHS/FTBP and the timing for the implementation of the inter-regional IWXXM exchange. **[MET/IE WG/20 - ACTION 03]**

4.16. Regarding Thailand's plan to provide performance indices for IWXXM reports, the Chair requested members to consider the document *Guidelines for the implementation of OPMET data exchange using IWXXM*[†††], which defines various statistics about IWXXM implementation.

IP/06 – PLANS AND IMPLEMENTATION STATUS OF IWXXM IN CHINA (China)

(TAC)

[***] Air Traffic Services (ATS) Message Handling System/File Transfer Body Part

[†††] Section 7 – *Data Validation and Statistics*, refers

4.17. China has established a real-time IWXXM exchange between ROC Beijing and ROC Hong Kong and has successfully demonstrated the international exchange of IWXXM bulletins between ROC Beijing and RODB Bangkok.

4.18. ROC Beijing performs translation of national METAR/SPECI and TAF bulletins from TAC to IWXXM (Version 3.0 and plans to upgrade to Version 3.1). The translation of national SIGMET bulletins from TAC to IWXXM (Version 3.1) is under development and expected to be completed this year. China is also establishing some of its AMOs and MWOs as "IWXXM Producers", which it expects to be operational in 2023.

4.19. The communication links between Beijing and Hong Kong and Beijing and Tokyo have been transferred to the CRV network. In addition, the establishment of CRV links with Thailand, Republic of Korea and Mongolia is in progress.

4.20. Subject to a mutual agreement, China may provide a translation service on behalf of Mongolia.

4.21. China noted the necessity of testing the exchange of IWXXM data and the importance of parameters to determine whether the received messages are duplicates.

IP/07 – IWXXM IMPLEMENTATION AND MONITORING IN HONG KONG, CHINA (Hong Kong, China)

4.22. Hong Kong, China's meteorological service provider, the Hong Kong Observatory (HKO), is an "IWXXM Producer" and generates OPMET data in IWXXM (Version 3.0 currently and is upgrading generation and translation to Version 2021-2[*]). HKO is also developing web service interfaces for local airline users to retrieve IWXXM reports.

4.23. In addition, HKO, in collaboration with ROC Hong Kong, hosted by the Civil Aviation Department (HKCAD), has developed IWXXM translation and aggregation services and supports IWXXM exchange over AMHS.

4.24. ROC Hong Kong has established an automatic email notification (to the originating centre) if an IWXXM report fails IWXXM validation.

4.25. ROC Hong Kong translates OPMET data from TAC to IWXXM on behalf of NOC Manila and NOC Macao and monitors the translation results.

4.26. To ensure the quality of IWXXM messages, ROC Hong Kong validates the IWXXM messages before aggregation and dissemination and monitors the validation results. As a result, the validation success rate (for METAR/SPECI) increased following the automatic notification (discussed above), which facilitated the rectification of IWXXM validation issues.

4.27. ROC Hong Kong disseminates IWXXM reports directly to other ROCs, including Singapore, Kuala Lumpur, Brisbane and Wellington. In addition, it has recently commenced regular dissemination of IWXXM messages to the ROCs Beijing and Tokyo. The HKCAD AMHS will be upgraded appropriately to facilitate the seamless relaying of IWXXM bulletins from other ROCs to NOCs.

[*] IWXXM version 2021-2 published in Nov 2021 supports the information and reporting requirements in Amendments 79 and 80 to ICAO Annex 3. A table showing the versions of IWXXM and its individual packages (e.g. METAR/SPECI) and their relationships to ICAO Annex 3 requirements can be found at: https://github.com/wmo-im/iwxxm/wiki/Package-Compatibility

4.28. Following the experience of IWXXM exchange tests in which IWXXM reports received from some ROCs contained two file body parts, ROC Hong Kong recalled the guidance which states that the IPM body shall contain exactly one body part, which is an FTBP. ROC Hong Kong also reminded ROCs of the need to use the FTBP and IHE functional groups of AMHS to ensure the AMHS systems and User Agents (UAs) could receive and forward the IWXXM messages properly.

4.29. The Meeting noted the availability of IWXXM version 2021-2[‡‡‡], published in Nov 2021, which supports the information and reporting requirements in Amendments 79 and 80 to ICAO Annex 3.

4.30. The Chair suggested that issues identified through monitoring IWXXM validation conducted by ROC Hong Kong could be used to supplement the document *IWXXM implementation in APAC Region – FAQs* (also discussed in WP/02 and WP/03).

4.31. Given the discussion above, the Meeting requested the Member from Hong Kong, China, with assistance from the member from New Zealand, to develop updates to the document *IWXXM implementation in APAC Region – FAQs* based on lessons learnt from the monitoring of IWXXM validation conducted by ROC Hong Kong. **[MET/IE WG/20 - ACTION 04]**

IP/08 – IWXXM IMPLEMENTATION IN SINGAPORE (Singapore)

4.32. The Meteorological Service Singapore (MSS) performs the functions of "Data Producer", "Data Aggregator", and "Data Translator", and the Civil Aviation Authority of Singapore (CAAS) operates as the State Communications (COM) Centre.

4.33. Singapore is currently using translation as the primary mode of IWXXM message generation; however, generation from source will be progressively implemented when the respective systems generating the data are upgraded.

4.34. The CAAS will complete upgrades to its AMHS in the first half of 2022.

4.35. Singapore exchanges IWXXM messages with the other ROCs, including Bangkok, Brisbane, Hong Kong, Kuala Lumpur, Tokyo and Wellington.

4.36. Singapore and London ROCs have successfully conducted IWXXM message exchange tests. The inter-regional exchange of IWXXM messages between IROG Singapore and IROG London will commence when the integrated diversion/alternate path between APAC and EUR is ready.

4.37. Singapore will continue to conduct message exchange tests with other ROCs and NOCs to support IWXXM exchange in the region.

IP/10 – IMPLEMENTATION OF IWXXM IN MONGOLIA (Mongolia)

4.38. The Aviation Meteorological Center has worked with an IT company to implement IWXXM (Version 3.0); however, unfortunately, during tests, many errors have occurred in the translation of OPMET from TAC to IWXXM.

4.39. Mongolia has referred to the official schema repository of the World Meteorological Organization (WMO). Still, it needs additional examples to support the translation service, which it expects to complete in 2022 and then test with ROC Beijing and other countries.

[‡‡‡] WMO schema repository (https://schemas.wmo.int/iwxxm/2021-2/)

4.40. The Civil Aviation Authority of Mongolia expects to establish the necessary communication links to support the international exchange of IWXXM messages by December 2022.

4.41. The member from China agreed to provide Mongolia examples of IWXXM-formatted messages to assist Mongolia with resolving its problems concerning the translation of OPMET from TAC- to IWXXM-form. The Meeting also recalled the relevant information provided by the World Meteorological Organisation (WMO)[§§§].

IP/09 – UPDATE TO ONLINE REGISTER OF APAC IWXXM EXCHANGE STATUS (Australia and Hong Kong China)

4.42. The *Online Register of APAC IWXXM Exchange Status* allows ROCs to share up-to-date information on the status of IWXXM exchange, including the readiness to receive IWXXM, supported AMHS capability, and dissemination of IWXXM reports to other ROCs and NOCs.

4.43. APANPIRG/32 adopted Conclusion APANPIRG/32/11: *Updating Online Register of IWXXM Exchange Status*, based on Draft Conclusion MET SG/25-03, to urge States to provide timely updates to the Online Register.

4.44. Since October 2021, the following States have updated the information in the online register: China, Hong Kong, China, Japan, Singapore and Thailand. As of March 2022, eight ROCs are currently capable of routinely receiving and disseminating IWXXM messages in the APAC Region.

4.45. Some States had indicated the capability to generate IWXXM reports but could not disseminate IWXXM data internationally to other ROCs because AMHS with FTPB and IHE is not yet implemented.

4.46. The Meeting recalled Conclusion APANPIRG/32/11: *Updating Online Register of IWXXM Exchange Status* (discussed in WP/04) and the associated follow-up action in progress that included an ICAO State Letter.

4.47. The member from Hong Kong, China suggested the proposed State letter (above) should inform States of the relevant reference material, including the *Guidelines for the implementation of OPMET data exchange using IWXXM* and *IWXXM implementation in APAC Region – FAQs*. In addition, the State Letter should encourage States further to implement the AMHS functionality necessary to support the dissemination of IWXXM formatted messages (e.g. as urged by APANPIRG in its Conclusion APANPIRG/30/17: *Implementation of IWXXM* and Conclusion APANPIRG/31/18: *Implementation of IWXXM*).

Note: Further updates to the IWXXM register, made on 29 March 2022, based on the input received from some States, but not covered in the discussion above, included the following:

- *complete AMHS addresses of ROC to receive IWXXM*
- *IWXXM generation for National OPMET Centre (NOC) Ha Noi*
- *dissemination list of ROC Brisbane*
- *remarks of New Caledonia*
- *status of ROC Washington*

A copy of the updated IWXXM register is included in Attachment XX to the Report for information and easy reference.

[§§§] IWXXM Translation Suite (https://github.com/wmo-im/iwxxm-translation)

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

WP/05 – ASIA/PAC INTER-REGIONAL OPMET GATEWAY BACKUP EXERCISE BETWEEN IROG SINGAPORE AND IROG BANGKOK (Singapore)

5.1. IROGs Singapore and Bangkok conducted their fourth IROG backup exercise on 29 September 2021. During the exercise, IROG Singapore took over IROG Bangkok's role in relaying the OPMET messages from APAC to MID and from 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 522 out of 522 (100%) METAR bulletins and 110 out of 110 (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, and the procedures for handover and takeover of responsibility are functional in the event IROG Bangkok experiences technical problems.

5.3. In response to a member's question, the Singapore member clarified that some bulletins in the backup exercise did not need to be transmitted to the ICAO Africa and Indian Ocean Region (AFI) IROG because, based on the routing requirement provided by IROG Bangkok, not all messages routed to the Middle East were required for Africa.

WP/11 – ASIA/PAC INTER-REGIONAL OPMET GATEWAY BACKUP EXERCISE BETWEEN IROG BANGKOK AND IROG SINGAPORE (Thailand)

5.4. IROGs Bangkok and Singapore conducted their seventeenth annual real-time backup exercise on 15 September 2021 to disseminate APAC OPMET data to WAFC London by IROG Bangkok if IROG Singapore experiences technical problems.

5.5. The backup test results showed that IROG Bangkok received and transmitted 557 of 559 (99.64%) METAR bulletins and 96 of 96 (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 0.03 and 1.33 minutes.

5.7. Given the results discussed above in WP/05 and WP/11, the Chair invited the other APAC IROGs to investigate their capabilities for providing mutual backup arrangements for inter-regional dissemination of APAC OPMET data.

WP/10 – ASIA/PAC OPMET PERFORMANCE INDICES (Thailand)

5.8. RODB Bangkok used a web-based analyser to compute OPMET Performance Indices (PIs) on OPMET data from the five RODBs: Bangkok, Brisbane, Nadi, Singapore and Tokyo in January 2022. December 2021 data was used to compute the thresholds. The monitoring was based on the ROBEX Handbook Thirteenth Edition — March 2019.

5.9. The three PIs calculated for the monitoring period were the Compliance Index, Availability Index and Regularity Index, as described in the ROBEX Handbook Thirteenth Edition – March 2019, Appendix F. A summary of the PIs follows:

- 11 of 301 (3.6%) aerodromes with Availability Index for METAR = 0 (nil report)
- 12 of 284 (4.22%) aerodromes with Availability Index for TAF = 0 (nil report)
- 5 of 301 (1.66%) aerodromes with low Availability Index for METAR > 0.0 and < 0.9
- 2 of 284 (0.70%) aerodromes with low Availability Index for TAF > 0.0 and < 0.9

- 92 of 301 (30.56%) aerodromes with low Compliance Index for METAR > 0.0 and < 0.9
- 14 of 301 (0.04%) aerodromes with Compliance index for METAR > 0.0 and < 0.5
- 16 of 301 (5.31%) aerodromes with low Compliance index for TAF > 0.0 and < 0.9

5.10. Based on the results above, the paper invited the Meeting to use the results to improve the OPMET data exchange in general and investigate unavailable data from the highlighted aerodromes.

5.11. Regarding the action proposed by WP/10, the member from New Zealand suggested the MET/IE WG review the methodology used to ensure the OPMET monitoring provides States with targeted information necessary to identify specific deficiencies in OPMET provision.

5.12. In addition, the Chair recalled the following existing action item:

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

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	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.]	Sep 2020	Secretariat	IN PROGRESS Ref: MET/IE WG, 5. Work Plan, Activity 1 and Activity 2

5.13. Given the discussion above, the Meeting considered assigning an ad hoc group to review the Performance Indices (PIs) used in APAC OPMET monitoring. **[MET/IE WG/20 - ACTION 05]**

5.14. The member from Japan reminded the Meeting that the recently published ROBEX Handbook (discussed in WP/07), which included changes to Japan's OPMET bulletins, was not available in time for the OPMET monitoring reported in WP/10. Therefore, because the monitoring was based on the outdated OPMET bulletin details in the ROBEX Handbook, Thirteenth edition – March 2019, the PIs of less than 0.9 attributed to Japan's OPMET bulletins in WP/10 would not be accurate.

5.15. To avoid similar issues in future OPMET monitoring, the Meeting requested Thailand to use as the benchmark for OPMET monitoring the latest available ROBEX data provided by the Secretariat (rather than by the published ROBEX Handbook). **[MET/IE WG/20 - ACTION 06]**

5.16. In a related discussion on the update schedule for the ROBEX Handbook, the Secretariat noted that the ROBEX Handbook stipulates it is updated "regularly" to reflect users' current requirements for OPMET.

IP/05 – DEVELOPMENT OF OPMET STATISTICS WEB APPLICATION (Thailand)

5.17. To support OPMET monitoring in IWXXM format, RODB Bangkok is currently developing a new web application capable of analysing OPMET data in both TAC and IWXXM forms. It is planned to replace the current PI analyser software, providing only TAC results.

5.18. The new application will enable RODB users to upload TAC and IWXXM files to generate RODB reports for OPMET data monitoring. RODB user accounts to access the application will be the

same as the current PI analyser. Upon receipt of OPMET data from RODBs, RODB Bangkok will generate the PIs report, aggregating all PIs from the five RODBs.

5.19. RODB Bangkok expects to launch the application for testing by RODBs in November 2022. Use of the application for OPMET PIs for TAC and IWXXM data is expected from January 2023 onwards.

6. Guidance material related to meteorological information exchange

WP/07 – ROBEX HANDBOOK UPDATES (Secretariat)

6.1. The Secretariat presented the latest version of the APAC ROBEX Handbook (Fourteenth Edition – March 2022), including the list of changes, in Appendices A and B to WP/07. The changes include updates endorsed by the MET/IE WG/17, MET/IE WG/19 and MET SG/24 meetings, and updates provided directly to the Secretariat by the Civil Aviation Authority of Mongolia and ROC Hong Kong.

6.2. The members from Thailand and Malaysia requested the Secretariat to update the ROBEX Handbook, Appendix I, to reflect changes in their focal point information. **[MET/IE WG/20 - ACTION 07]**

6.3. In response to a member's query concerning the States listed in the list of area designators in the ROBEX Handbook in Appendix D, 2.1.2. c), the Meeting considered that the list, which replicated part of the WMO No. 386, Table C1, Part II – *Area Designators*, was unnecessary in the ROBEX Handbook. Therefore, the Meeting requested the Secretariat to delete it in the next update of the ROBEX Handbook. **[MET/IE WG/20 - ACTION 08]**

6.4. In response to another member's query concerning details of the ROBEX Handbook, Appendix E – *Procedure and Format of METNO bulletin for APAC ROBEX Bulletins*, the Meeting requested the regional focal point and team for management of the METNO process (i.e. the relevant ICAO Regional Officer and ROBEX Focal Points from Australia, Hong Kong, China, Japan and Singapore) to develop updates to clarify the procedures concerning the general area designator in the METNO Header (at paragraph 2.2.) and the responsibilities for issuance of METNO messages. **[MET/IE WG/20 - ACTION 09]**

WP/08 – UPDATES TO ROBEX HANDBOOK (Indonesia)

6.5. The paper from Indonesia proposes updates to the ROBEX Handbook concerning the Jakarta ROC METAR Bulletin and the ROBEX Focal Point for Indonesia.

6.6. There are differences between airport names and location indicators in the ROBEX Handbook Fourteenth Edition (Nov. 2020) and the ANP Tables AOP I-1 and MET II-2, which require appropriate amendments to the ROBEX Handbook.

6.7. In addition, Indonesia proposes adding ROC Beijing (ZBBBYPYX) to the dissemination list for Indonesia's METAR bulletins and amending the bulletin time and availability in the ROBEX Handbook based on Indonesia's airport operating hours.

6.8. The ROBEX Focal Point in Indonesia has changed and requires amendment in the ROBEX Handbook.

6.9. Concerning the WP/08, the Meeting noted that some of the proposed changes to aerodrome names were not reflected in the ANP, Table AOP I-1 – *International Aerodromes Required in the APAC Regions*. Therefore, to progress the proposed updates, the Meeting requested the Secretariat coordinate with Indonesia to a) validate all the proposed updates and b) include the validated proposals in the next update of the ROBEX Handbook. **[MET/IE WG/20 - ACTION 10]**

IP/11 – UPDATES TO ROBEX HANDBOOK (Mongolia)

6.10. The paper from Mongolia proposes updates to the ROBEX Handbook concerning operational changes at Chinggis Khaan International Airport to serve regular international flights and the ROBEX Focal Point for Mongolia.

6.11. Chinggis Khaan International Airport operates regular international flights, while Buyant-Ukhaa International Airport operates as an alternative airport. Therefore, transmitting and disseminating the half-hour METAR of Chinggis Khaan International airport for international data exchange is necessary.

6.12. The proposal shifts ULAANBAATAR/Chinggis Khaan METAR and TAF data from "BUL No. SACI32 / FTCI32" to "BUL No. SACI31 / FTCI31" in the ROBEX Handbook.

6.13. In addition, a new ROBEX Focal Point is proposed for Mongolia.

6.14. Given the discussion above, the Meeting requested the Secretariat coordinate with Mongolia to a) notify the regional focal point and team for management of the METNO process of the changes and b) include the proposals in the next update of the ROBEX Handbook. **[MET/IE WG/20 - ACTION 11]**

Process for changing the ROBEX Scheme and MET service

6.15. Following the discussion under WP/07, WP/08 and IP/11 concerning the members' need for clarity of the process for changing the ROBEX Scheme and MET service, the Meeting requested the Secretariat document the steps States should take to a) effect changes to the ROBEX scheme and b) notify States of changes to MET service. **[MET/IE WG/20 - ACTION 12]**

7. Future work program and terms of reference

WP/09 – REVIEW MET/IE WG WORK PROGRAM AND TERMS OF REFERENCE (Secretariat)

7.1. The Secretariat presented the MET/IE WG terms of reference and work plan document, which MET SG/25 had previously reviewed, in Appendix A to WP/09.

7.2. To remove any limitation to assessing the availability of IWXXM formatted OPMET, the Meeting agreed to remove the reference to "TAC" in the work plan, Activity 1.4: *Assess TAC OPMET monitoring results and share results with RODBs*, as indicated in **Appendix B** to the Report.

7.3. Regarding Activity 1: *Availability of OPMET information* and Activity 2: *Timeliness, compliance and regularity of OPMET exchange* in the work plan, the Meeting acknowledged that RODB Bangkok had assumed primary responsibility for the OPMET monitoring. Therefore, the Meeting considered the reason to keep the two closely related activities separate no longer existed.

7.4. The Meeting recalled that in response to Decision MET SG/25-02: *Review the consistency in terminology and reporting format of the working groups* (also discussed in WP/03), the Secretariat and Chairs of MET SG and WGs were preparing a standard, integrated reporting template (for the MET SG and WGs).

7.5. Given the discussion above, the Meeting requested the Chair and Secretariat 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 and merging Activities 1 and 2 in the work plan. The Meeting further identified that identifying a lead and supporting resources for activities was also desirable. The quarterly Meeting should occur after the Secretariat and Chairs of MET SG and WGs have prepared the integrated reporting template and ideally before MET SG. **[MET/IE WG/20 - ACTION 13]**

7.6. The updates to the MET/IE WG work program and terms of reference discussed above and agreed upon by the Meeting are indicated in **Appendix B** to the Report.

8. Any other business

8.1. No discussion under this item.

9. Next Meeting

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

- **20-21** or **27-28 March 2023** – MET/IE WG/21
- **22** or **29 March 2023** – Conjoint Session of MET/IE WG/21 and MET/S WG/13

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REPORT ON AGENDA ITEMS – CONJOINT SESSION OF MET/IE WG/20 AND MET/S WG/12

1. Volcanic ash advisory centre (VAAC) backup tests

IP/C01 – UPDATE TO WASHINGTON VAAC BACKUP PROCEDURES (United States)

1.1. On 01 November 2021, VAAC Washington changed its backup procedures such that VAACs Montreal and Darwin are now the primary backup centres for VAAC Washington. VAAC Montreal will monitor the United States (except for Alaska), Mexico, the Caribbean, and parts of the Pacific and the Atlantic Ocean during backup operations. VAAC Darwin will monitor Central America and northern South America, including the Galapagos Islands, parts of the Pacific Ocean, and the Marianas Islands.

1.2. If the VAACs Montreal or Darwin could not provide backup support, the U.S. Air Force 557th Weather Wing (557WW) would take over backup operations[****] for VAAC Washington.

1.3. The Chair of MET/IE WG suggested MET/IE WG considers the possibility of using the information from IP/C01 to supplement the *APAC VAAC Backup Procedures* (in the *APAC Regional SIGMET Guide*, Appendix G).

1.4. Considering the guidelines[††††] recommend that VAACs test the backup arrangements annually, the Meeting requested VAAC Darwin to 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. **[MET/IE WG/20 – ACTION 14]**

IP/C02 – VAAC DARWIN AND VAAC WELLINGTON BACKUP TEST (Australia/New Zealand)

1.5. Following the guidelines (mentioned above), VAACs Darwin and Wellington completed a backup test on 01 December 2021. Airways New Zealand assisted with disseminating the test message from VAAC Wellington as an interim solution pending required system changes at VAAC Wellington. The VAACs coordinated the backup test using the Microsoft Teams chat application (which, in operational scenarios, had proved to be a helpful tool).

1.6. Confirmation emails were received from only a limited number of the expected backup test message recipient operational units. These included the VAAC Washington, Regional OPMET Data Bank (RODB) Bangkok, and Meteorological Watch Offices (MWOs) located in Fiji, Sri Lanka and Vietnam.

1.7. When the (abovementioned) VAAC Wellington system changes are complete, VAACs Darwin and Wellington will conduct a follow-up backup test. In addition, the VAACs will develop procedures to disseminate backup test messages to the recipient operational units without AFTN[‡‡‡‡] access, such as State volcano observatories, and endeavour to notify States early to facilitate their participation in the backup tests.

[****] Following the guidelines in ICAO Doc 9766 – *Handbook on the International Airways volcano watch (IAVW) Operational Procedures and Contact List*, Second Edition, 2004, Appendix D, *Backup Procedures for VAACs*

[††††] ICAO Doc 9766, Appendix D, part f)

[‡‡‡‡] Aeronautical Fixed Telecommunication Network

2. SIGMET tests

WP/C01 – REVIEW OF WS SIGMET TEST 2021 (Singapore)

2.1. The member from Singapore (as the APAC WS[§§§§] SIGMET test focal point) presented results from the 2021 APAC WS SIGMET Test, conducted on 22 December 2021.

2.2. Regarding the rate of participation by States in 2021, the WS SIGMET test result was 79%, i.e., equivalent to the 2020 WS SIGMET test result. Twenty-nine (29) participating States were expected in 2021, and six (6) States did not participate, namely: Afghanistan, Maldives[1], Myanmar[2], Nauru, Papua New Guinea and Philippines[3]. *Notes: [1]refer to paragraph 2.8 (below) for further discussion; [2]refer to paragraphs 2.22 to 2.23 (below) for further discussion; and [3]refer to paragraphs 2.6 to 2.7 (below) for further discussion.*

2.3. Regarding the rate of issuance of WS SIGMET test messages in 2021, the WS SIGMET test result was 86%, i.e., lower than the 2020 WS SIGMET test result of 89%. Forty-nine (49) SIGMET test messages were expected in 2021; the number of SIGMET test messages MWOs issued was forty-two (42).

2.4. Regarding the rate of reception of WS SIGMET test messages in 2021, the WS SIGMET test result was 97%, i.e., slightly higher than the 2020 WS SIGMET test result of 96%. MWOs issued forty-two (42) SIGMET test messages in 2021; the number of SIGMET test messages received by the participating RODBs and ROC was, on average, forty-one (41).

2.5. The member from Australia informed the Meeting that SIGMET test data from MWO Melbourne was missing (from the results in WP/C01) due to an internal procedural error [at the MWO], which Australia had since identified and resolved. Therefore, Australia anticipated full participation of its MWOs in future SIGMET tests.

2.6. The Member from Philippines informed the Meeting that MWO Manila could not participate in the 2021 SIGMET tests due to an internal technical issue that Philippines was still resolving. Philippines sent an email about the above problem to ICAO.

2.7. Furthermore, OPMET data from Philippines were temporarily disseminated internationally through an arrangement with the Hong Kong Observatory; thus, the OPMET data were disseminated without interruption.

2.8. The Member from Maldives informed the Meeting that MWO Male missed the 2021 SIGMET tests but confirmed that the MWO Male was operating without interruption [to its services] and will participate in future SIGMET tests.

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

2.9. The member from Japan (as the APAC WC[*****] and WV[†††††] SIGMET test focal point) presented results from the 2021 APAC WC and WV SIGMET Tests conducted on 08 and 15 December 2021, respectively.

2.10. In the 2021 APAC WC and WV SIGMET Tests, advisory test messages were issued as anticipated by the following five (5) Tropical Cyclone Advisory Centres (TCACs): Nadi, New Delhi,

§§§§ SIGMET for phenomena other than volcanic ash cloud or tropical cyclone
***** SIGMET for tropical cyclone
††††† SIGMET for volcanic ash cloud

Reunion, Tokyo and Honolulu, and the following six (6) VAACs: Anchorage, Darwin, Toulouse, Tokyo, Washington and Wellington.

2.11. Regarding the rate of issuance of WC and WV SIGMET test messages in 2021, the WC and WV SIGMET test results were 76% and 86%, respectively; i.e., lower than the 2020 WC and WV SIGMET test results of 82% and 91%, respectively. Fifty (50) and fifty-six (56) WC and WV SIGMET test messages, respectively, were expected to be issued in 2021; the number of WC and WV SIGMET test messages MWOs issued was thirty-eight (38) and forty-eight (48), respectively.

2.12. In 2021, the following five (5) APAC States did not issue WC SIGMET test messages: Maldives[1], Myanmar[2], Nauru, Papua New Guinea and Philippines[3]. In addition, the following eight (8) APAC States did not issue WV SIGMET test messages: Afghanistan, Bangladesh, Maldives[1], Mongolia, Myanmar[2], Nauru, Papua New Guinea and Philippines[3]. *Notes:* [1]*refer to paragraph 2.8 (above) for further discussion;* [2]*refer to paragraphs 2.22 to 2.23 (below) for further discussion; and* [3]*refer to paragraphs 2.6 to 2.7 (above) for further discussion.*

2.13. In 2021, thirteen (13) of the WC or WV SIGMET test messages (issued by MWOs with areas of responsibility within the APAC Region) contained errors. According to the detailed table in WP/C02 (Appendices 5 and 6, refer), the errors occurred in the SIGMET test message "priority indicator" or in specific elements of the "(WMO[‡‡‡‡‡]) abbreviated heading", i.e., the time group, data type indicator, bulletin number and location indicator.

2.14. The member from New Zealand informed the Meeting that participation by MWO Tahiti (French Polynesia) in the SIGMET tests had facilitated the identification and rectification of issues concerning message routing and internal systems, which had prevented MWO Tahiti from receiving some advisory messages. In addition, French Polynesia sent an email about the above matter to ICAO.

2.15. The Chair MET/IE WG reminded the Meeting that during the APAC Region SIGMET tests, the procedures require an MWO to issue a SIGMET test message even when the MWO does not receive the expected advisory test message from its associated TCAC or VAAC. Furthermore, in addition to the Region-wide tests, ICAO Annex 3 (Tables A2-1, A2-2, A2-3 and A6-1A) enables MWOs and advisory centres to issue SIGMET and advisory test messages at any time. Therefore, States can perform individual SIGMET tests as needed, e.g. when making changes to or resolving issues in their systems. *Note: refer to paragraph 2.20 (below, under WP/C03) for further discussion*

2.16. The Meeting noted that the results presented in WP/C02, Appendix 2, identified States that did not participate in the last two APAC Region SIGMET tests (2020 and 2021). The Meeting considered this information helped identify States that may need some assistance regarding SIGMET issuance. *Note: refer to paragraphs 2.22 to 2.26 (below, under WP/C03) for further discussion.*

2.17. In discussing the inclusion of MWOs not located in the APAC Region, the Meeting requested the Secretariat to cross-check the ICAO APAC *SIGMET Test Procedures* against the information in the legacy FASID Tables MET 3A – *Tropical Cyclone Advisory Centres* and 3B – *Volcanic Ash Advisory Centres*. **[MET/IE WG/20 – ACTION 15]**

2.18. The Chair MET/IE WG recommended the MET/IE WG consider how to incorporate (in the APAC Region SIGMET tests) the dissemination of SIGMET and advisory messages in the ICAO Meteorological Information Exchange Model (IWXXM) form. The Meeting agreed to the recommendation and requested that MET/IE WG and MET/S WG designate an ad hoc group[§§§§§] to

‡‡‡‡‡ World Meteorological Organization
§§§§§ In alphabetical order: Christy, Marco, Kentaro, Paula [Rapporteur] (assisted by Humphrey), Pierre and Tim

develop a proposal to update the *SIGMET Test Procedures* accordingly. **[MET/IE WG/20 – ACTION 16]**

WP/C03 – APPLICATION OF MET DEFICIENCY IDENTIFICATION METHODOLOGY TO 2021 ANNUAL SIGMET TESTS (New Zealand)

2.19. Following the discussion at MET SG/25 on air-navigation deficiencies in the MET field (Report of MET SG/25, paragraphs 4.5 and 4.11, refer), a methodology has been applied using the 2021 ICAO APAC SIGMET test results to identify issues in SIGMET information. The method helped identify issues concerning the coding and dissemination of SIGMET- and advisory- test messages and opportunities for MWOs, TCACs and VAACs concerned to resolve the deficiencies in SIGMET test messages and where applicable, operational SIGMET messages.

2.20. WP/C03 reaffirmed the value of SIGMET tests, either periodically or whenever SIGMET issuance systems are upgraded or changed, in helping to identify and eliminate errors in SIGMET service.

2.21. Additional outcomes from the above activity included suggestions for improving (a) the *SIGMET test procedures*; regarding the SIGMET heading time group (GGgg) and the association between MWOs and TCACs/VAACs, and (b) the presentation of SIGMET test results; regarding MWOs not in the APAC region and MWOs associated with more than one TCAC or VAAC.

2.22. Regarding the non-participation of some States in the 2021 APAC Region SIGMET tests, as noted in WP/C03 (in the table in paragraph 2.5), the Meeting was informed that an MWO concerned did not receive from ICAO the letter on the subject *Schedule for SIGMET tests in the ICAO Asia and Pacific Region – 2021*.

2.23. Given the discussion above, the Meeting requested the Secretariat follow up with Myanmar on the appropriate addressing of letters from ICAO inviting participation in SIGMET tests. **[MET/IE WG/20 – ACTION 17]**

2.24. In addition, the Meeting requested the Secretariat to 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. **[MET/IE WG/20 – ACTION 18]**

2.25. The Meeting noted the corrective actions suggested in WP/C03 to resolve issues identified in the SIGMET test results as presented in WP/C01 and WP/C02 required the involvement of the MET/S WG ad hoc group on MET deficiencies. Therefore, the Meeting requested the Secretariat coordinate with the ad hoc group to prepare the ICAO letter advising States of SIGMET test deficiencies. **[MET/S WG/12 – ACTION 01]**

2.26. The Meeting considered that the MET/IE WG and MET/S WG should continue to monitor the non-participation of States in the APAC Region SIGMET tests as part of the WG's post-analysis activities that support the States' corrective actions.

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APPENDIX A

MET/IE WG – LIST OF ACTIONS

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

New 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	Secretariat, in coordination with participants from Australia	
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	Secretariat, in coordination with participants from Vietnam	
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	Secretariat, in coordination with participants from Thailand	
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	Members from Hong Kong, China, assisted by members from New Zealand	
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/21	Secretariat and Chair MET/IE WG and designated ad hoc group, including Members from Thailand and TBD	
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/21	Thailand, in coordination with the Secretariat	
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	Secretariat, in coordination with participants from Thailand and Malaysia	
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	
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	Secretariat and ROBEX Focal Points from Australia, Hong Kong, China, Japan and Singapore	
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	
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	

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
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	Secretariat	
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	Chair MET/IE WG and Secretariat	
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/21	Members from VAAC Darwin	
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	Secretariat	
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	MET/IE WG and MET/S WG designated ad hoc group	
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	Secretariat, in coordination with participants from Myanmar	
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	Secretariat	

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	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	WG	To commence
03	**Propose appropriate updates to the ROBEX scheme and ROBEX Handbook**: to include the requirement for ROBEX centres to send OPMET bulletins to all RODBs (Including updates to Tables A and B) [ref: para. 3.5.]	May 2021	WG	~~To commence~~ Completed; ROBEX HB 14th Ed.
04	**Propose updates to the ROBEX Handbook**: to include the WMO message headers (TTAAii CCCC) for each type of space weather advisory information (GNSS, HF COM, Radiation and SATCOM) in Traditional Alphanumerical Code (TAC)- and ICAO Meteorological Information Exchange Model (IWXXM)-form [ref: para. 3.8.]	May 2021	Secretariat	~~To commence~~ Completed; ROBEX HB 14th 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	Secretariat	~~To commence~~ Part completed; ROBEX HB 14th Ed.; updates pending concerning Pago Pago

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
06	**Propose updates to the ROBEX Handbook**: to include a link to the online register provided by the APAC ROCs for IWXXM-exchange-capability (in accordance with MET SG/24, Decision MET SG/24-15: *Updates to ROBEX Handbook*, and Conclusion MET SG/24-12: *Development of Online Register of the status of IWXXM Exchange)* [ref: para. 4.6.]	May 2021	Marco, Tim	~~To commence~~ Completed; ROBEX HB 14th Ed.
07	a) Provide additional feedback on the draft **"FAQs of IWXXM implementation"** (MET/IE WG/19, WP/17); and b) Present a proposal for MET SG/25 to possibly approve the publication of the FAQs (as either a standalone document or incorporated in another document) for use by States [ref: para. 4.11.]	a) Apr 2021 b) May 2021	a) WG members, b) Marco, Tim, Secretariat, IATA	~~To commence~~ Completed; Conclusion MET SG/25-01
08	**Publish the MET SG/24-approved updates to the ROBEX Handbook:** as presented at Appendix 10 to the MET/SG/24 Report, including the corrections to AFTN addresses provided by Fiji and presented at Appendix A to MET/IE WP/19, WP/12 – *ROBEX Handbook Updates* [ref: para. 6.2.]	Mar 2021	Secretariat	~~To commence~~ Completed; ROBEX HB 14th Ed.
09	**Propose updates to the ROBEX Handbook**: to include the changes to data in Appendix A, Appendix B and Appendix I of the ROBEX Handbook, as advised by Japan and presented in MET/IE WG/19, WP/13 – *Updates to ROBEX Handbook*. [ref: para. 6.5.]	May 2021	Secretariat	~~To commence~~ Completed; ROBEX HB 14th Ed.
10	**Propose updates to the ROBEX Handbook**: to include the changes to data in Appendix A of the ROBEX Handbook, as advised by Republic of Korea and presented in MET/IE WG/19, WP/14 – *Update to ROBEX Handbook*. [ref: para. 6.8.]	May 2021	Secretariat	~~To commence~~ Completed; ROBEX HB 14th Ed.
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	~~To commence~~ In progress; MET/IE WG/20, IP/02
12	**Propose updates to the ROBEX Handbook:** to include the Space Weather Advisory dissemination scheme (MET/IE WG/19, Flimsy/01) [ref: para. 6.14.]	May 2021	Secretariat	Completed; ROBEX HB 14th 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
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

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
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 ~~Sep 2020~~	Secretariat	IN PROGRESS Ref: MET/IE WG, 5. Work Plan, Activity 1 and Activity 2
IWXXM implementation				
11	**IWXXM implementation – FAQs:** Prepare and publish an "FAQ"-type resource taking into consideration the IWXXM-related matters discussed in the meeting and the considerable information collated from previous IWXXM workshops and related activities [ref: para. 3.28.]	Before and (update) after IWXXM Webinar	Secretariat and MET/IE WG	~~IN PROGRESS Ref: MET/IE WG, 5. Work Plan, Activity 7~~ Completed; Conclusion MET SG/25-01
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/24	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
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/24	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/24	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.]	As necessary	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/24	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~~24~~	MET/IE WG	IN PROGRESS Ref: MET/IE WG, 5. Work Plan, Activity 3 AND Ref: MET/S WG, 5. Work Plan, Activity 3
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~~24~~	MET/IE WG and MET/S WG	IN PROGRESS Ref: MET/IE WG, 5. Work Plan, Activity 4

Unresolved action items recorded by MET/IE WG/17

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]*	TBA	Cambodia and Secretariat	**TO COMMENCE** Action should be completed before handover of SIGMET service
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]*	17 Jun 2019	China and Secretariat	**TO COMMENCE** Action should be completed before commencement of new OPMET service
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	~~**TO COMMENCE**~~ **IN PROGRESS**
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]*	Next meeting MET/IE WG	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**
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	**IN PROGRESS**
17/13	In conjunction with the outstanding action item 16/5: (a) Prepare a checklist to assist States in systematically addressing the OPMET issues at locations with low PIs in the monitoring data; and (b) Provide the checklist as guidance to the States concerned. *[Report of MET/IE WG/17, para. 5.11 – 5.14, refers]*	Next meeting MET/IE WG	Secretariat and Thailand	~~**IN PROGRESS**~~ Superseded; included in work plan, Activity 1.8 and 2.6
17/14	In order to ensure availability of OPMET bulletins at all RODBs: (a) Propose appropriate updates to the ROBEX scheme and ROBEX Handbook to include the requirement for ROBEX centres to send OPMET bulletins to all RODBs; and (b) Requested all ROBEX centres to send their associated OPMET bulletins to all RODBs. *[Report of MET/IE WG/17, para. 5.11 – 5.17, refers]*	17 Jun 2019	MET/IE WG	~~**IN PROGRESS**~~ Completed; ROBEX HB 14th Ed.
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	**IN PROGRESS** Related to action items: 17/3, 17/4, 17/11, 17/12 and 17/14
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]*	17 Jun 2019	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	**IN PROGRESS**

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].	June 2017	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].

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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).

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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 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 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) 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**

Interim Work Program Progress Report	MET/IE WG Members	Web-conference E-mail	Quarterly/as determined by Chair	Chair and Secretariat
MET Chairs Coordination Meeting	Chairs of MET SG and its contributory working groups	Web-conference E-mail	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 (published 14-days or more before the meeting)	Chair and Secretariat

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	MET/IE WG	
Activity 8: MET information exchange scheme	2021-2026	MET/IE WG	
Activity 9: MET information in SWIM	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	

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
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: 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	
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, compliance and regularity results to METSG	Chair	2.4	Annually May	
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 if requested.	RODBs	2.6	As required	
Milestone 2: Achieve 95% (90%) or greater OPMET timeliness, 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	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

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
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	
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 20201	
Activity 5.2: Review IROG Back-up Test procedures to include all IROG.	IROG Bangkok and Singapore	-	Apr 2019, 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 monitoring procedure in ROBEX Handbook and update as necessary.	All RODBs	-	Annually Apr	
Activity 6.2: Changes to RODB monitoring procedures and 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		Nov 2021	
Activity 6.4: Define quality threshold for translated data	IATA, Chair WG		Nov 2021	
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	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	WG		As required	
Activity 7.11: Development and Publishing AMHS/FTBP network map	Pierre, Secretariat		Monthly	
Activity 7.12: State IWXXM status register	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	
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	
Activity 8.4: Improve the efficiency of Request/Reply service	RODBs	8.3	Sep 2021	

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
Milestone 8: Improved efficiency and effectiveness of ROBEX Scheme	MET/IE WG	-	2021	
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	
Milestone 9: Participated in the development of SWIM Meteorological services for APAC	MET/IE WG	-	2023	

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MET/IE WG/20
Appendix C to the Report

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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/19	Secretariat
2	WP/03	FOLLOW-UP ACTION FROM MET SG/25	Secretariat
2	WP/04	FOLLOW-UP ACTION FROM APANPIRG/32	Secretariat
5	WP/05	ASIA/PAC INTER-REGIONAL OPMET GATEWAY BACKUP EXERCISE BETWEEN IROG SINGAPORE AND IROG BANGKOK	Singapore
4	WP/06	INCLUSION OF TAF EXTENSIONS IN IWXXM TAF BULLETINS	Australia
6	WP/07	ROBEX HANDBOOK UPDATES	Secretariat
6	WP/08	UPDATES TO ROBEX HANDBOOK	Indonesia
7	WP/09	REVIEW MET/IE WG WORK PROGRAM AND TERMS OF REFERENCE	Secretariat
5	WP/10	ASIA/PAC OPMET PERFORMANCE INDICES	Thailand
5	WP/11	ASIA/PAC INTER-REGIONAL OPMET GATEWAY BACKUP EXERCISE BETWEEN IROG BANGKOK AND IROG SINGAPORE	Thailand
Conjoint session of MET/IE SG/20 and MET/S WG/12			
C2	WP/C01	REVIEW OF WS SIGMET TEST 2021	Singapore
C2	WP/C02	RESULTS OF SIGMET TESTS 2021 – WC and WV	Japan
C2	WP/C03	APPLICATION OF MET DEFICIENCY IDENTIFICATION METHODOLOGY TO 2021 ANNUAL SIGMET TESTS	New Zealand

INFORMATION PAPERS			
Agenda Item	**IP No.**	**Title**	**Presented by**
1	IP/01	MEETING BULLETIN	Secretariat
3	IP/02	TO INPUT VVVD INTO ROBEX SCHEME TO FACILITATE INTERNATIONAL FLIGHT OPERATIONS	Vietnam
4	IP/03	UPDATES ON THE IMPLEMENTATION OF IWXXM IN JAPAN	Japan
4	IP/04	STATUS AND PLANS FOR IMPLEMENTATION OF IWXXM IN THAILAND	Thailand
5	IP/05	DEVELOPMENT OF OPMET STATISTICS WEB APPLICATION	Thailand

INFORMATION PAPERS			
Agenda Item	**IP No.**	**Title**	**Presented by**
4	IP/06	PLANS AND IMPLEMENTATION STATUS OF IWXXM IN CHINA	China
4	IP/07	IWXXM IMPLEMENTATION AND MONITORING IN HONG KONG, CHINA	Hong Kong, China
4	IP/08	IWXXM IMPLEMENTATION IN SINGAPORE	Singapore
4	IP/09	UPDATE TO ONLINE REGISTER OF APAC IWXXM EXCHANGE STATUS	Australia and Hong Kong China
4	IP/10	IMPLEMENTATION OF IWXXM IN MONGOLIA	Mongolia
6	IP/11	UPDATES TO ROBEX HANDBOOK	Mongolia
Conjoint session of MET/IE SG/20 and MET/S WG/12			
1	IP/C01	UPDATE TO WASHINGTON VAAC BACKUP PROCEDURES	United States
1	IP/C02	VAAC DARWIN AND VAAC WELLINGTON BACKUP TEST	Australia/New Zealand

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