

INTERNATIONAL CIVIL AVIATION ORGANIZATION



REPORT OF THE CONJOINT

**EIGHTEENTH MEETING OF THE METEOROLOGICAL
INFORMATION EXCHANGE WORKING GROUP (MET/IE WG/18)**

AND

**TENTH MEETING OF THE METEOROLOGICAL SERVICES WORKING GROUP
(MET/S WG/10)**

(Web-conference, 27 – 31 July 2020)

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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INTRODUCTION

1. Meeting

1.1. The ICAO Asia and Pacific (APAC) Regional Office hosted the Eighteenth Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/18) and Tenth Meeting of the Meteorological Services Working Group (MET/S WG/10), conjointly, by web-conference from 27 to 31 July 2020.

1.2. A special introductory session preceded the meeting on 25 July 2020 to enable participants to test their web-conference connectivity.

2. Attendance

2.1. One hundred and thirty-six (136) participants registered their attendance at the meeting from twenty-four (24) States/Administrative Regions and two (2) International Organizations, including: Australia, Bangladesh, Bhutan, Brunei Darussalam, Canada, China, Hong Kong China, Macao China, Fiji, India, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, New Zealand, Philippines, Republic of Korea, Singapore, Sri Lanka, Thailand, United States, Vanuatu, Viet Nam and the IATA and ICAO. The list of participants is at **Appendix D** to this Report.

3. Officers and Secretariat

3.1. Mr. Tim Hailes, National Manager, Aviation Service Development, Bureau of Meteorology, Australia and Mr. Chan Pak Wai, Assistant Director, Hong Kong Observatory, Hong Kong China, presided as Co-Chairs 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 twenty-eight (28) Working Papers (WPs) and twenty (20) Information Papers (IPs). The list of papers is at **Appendix E** to this Report.

5. Outcomes from the meeting

5.1. The Meeting recorded outcomes of its discussions in the form of Draft Decisions (for further consideration by the Meteorology Sub-group (MET SG)) and Decisions (of the MET/IE WG and MET/S WG) within the following definitions:

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

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

5.2. The Meeting formulated two (2) Draft Decisions and adopted one (1) Decision as follows:

Draft Decision MET/SG/24/x: Updates to legacy FASID Table information

That, ICAO and States update and incorporate the required information from the legacy Facilities and Service Implementation Document (FASID) Tables relating to meteorology, into existing ICAO APAC regional guidance documentation as follows:

FROM: Legacy FASID Table

Table MET 2A - OPMET Information (METAR, SPECI and TAF) Required in SADIS and WIFS

Table MET 3A - Tropical cyclone advisory centres

Table MET 3B - Volcanic ash advisory centres

Chart MET 1 - Areas of Responsibility of the TCACs

Chart MET 2 - Map of Areas of Responsibility of VAAC and Corresponding FIR

TO: Existing APAC regional guidance

APAC ROBEX Handbook

APAC Regional SIGMET Guide

APAC Regional SIGMET Guide

APAC Regional SIGMET Guide

APAC Regional SIGMET Guide

Decision MET/S WG/10/1: Encourage airlines and ATS units to share more special air-reports to the associated MWOs

That, MET/S WG supports the agreed action at MET/R WG/9 (Action 9/1) that invites ICAO to publicise by way of State letter (and/or other channels) the importance of exchanging special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices)

Draft Decision MET/SG/24/x: Updates to Regional SIGMET Guide

That, the MET SG approves the updates to the SIGMET Guide as presented in WP/24 for use by States and publishing on the ICAO APAC Office website

5.3. In addition, the meeting agreed to thirty-three (33) **ACTION** items, as indicated throughout the *Report on Agenda Items*, below, and in the Task List at the **Appendix A** to this Report.

REPORT ON AGENDA ITEMS

1. Agenda Item 1: Opening of the meeting and organizational matters

WP/01: Provisional Agenda (Secretariat)

1.1. The meeting adopted the agenda proposed in WP/01.

2. Agenda Item 2: Outcomes from MET/IE WG related meetings

WP/02: Follow-up action from MET/IE WG/17 (Secretariat)

2.1. The previous meeting (MET/IE WG/17) generated a Task List of twenty (20) new action items for follow-up by members of the MET/IE WG, in addition to the six (6) outstanding action items carried over from previous meetings.

2.2. The meeting agreed to the proposed updates to the MET/IE WG Task List as presented in WP/02. In addition, the meeting considered that follow-up was completed on action item no. 17/17.

2.3. To facilitate progress on follow-up on the action items in the Task List/s, the Secretariat in conjunction with the respective Chairs and relevant members of the working groups will make use of regular online coordination meetings [**ACTION 01**].

2.4. In related discussion, the meeting noted that several papers were not available for review by participants with due lead time before the meeting. To support future meeting participants' effective consideration of the information and proposals in meeting papers and reports, the MET/IE WG and MET/S WG will propose updates to their terms of reference documents to reflect the desirable deadlines, as adopted by the MET SG, for submission and publication of meeting papers and reports (i.e., submit papers ≥ 28 -days before the meeting, publish papers ≥ 14 -days before the meeting and publish reports ≤ 21 -days after the meeting) [**ACTION 02**].

3. Agenda Item 3: Monitoring of meteorological information exchange

WP/04: APAC IROG backup exercise between Bangkok and Singapore (Thailand) and WP/28: APAC IROG backup exercise between Singapore and Bangkok (Singapore)

3.1. In accordance with the MET/IE WG work programme, the Inter-Regional OPMET Gateways (IROG) at Bangkok and Singapore conducted annual mutual backup tests of IROG operations in September 2019. Results from the tests demonstrated the IROGs' capabilities to successfully provide operational backup service for the transmission of required OPMET data.

3.2. The IROGs Bangkok and Singapore will continue to conduct regular (annual) IROG backup exercises and report the results to MET/IE WG.

WP/03: APAC OPMET Performance Indices (Thailand)

3.3. Performance Indices (PIs) as computed and analysed by the Regional OPMET Data Bank (RODB) Bangkok, from the annual OPMET monitoring activity conducted by the five (5) APAC RODBs in accordance with the MET/IE WG work programme, identified a total of forty-six (46)

aerodrome locations in the nineteen (19) APAC States with OPMET PIs below a nominated benchmark of 0.5 (in a range of 0.0 – 1.0).

3.4. In order to use the results of the OPMET monitoring data presented by Thailand to facilitate improved availability, compliance and regularity of OPMET in the APAC Region, the Secretariat will inform States concerned of the locations with low performance indices and advise the States to take appropriate corrective actions [**ACTION 07**].

3.5. To further facilitate the concerned States' investigation of the apparent unavailability of data from certain aerodromes, the Secretariat will address the above communication also the Regional OPMET Centres (ROCs) responsible for the collection of OPMET messages from the originating stations [**ACTION 19**].

3.6. To facilitate identification and rectification of discrepancies in the OPMET PIs, the MET/IE WG will review and update its work programme as necessary to ensure the APAC RODBs review the results of the OPMET monitoring activities prior to submission to the MET/IE WG meetings [**ACTION 08**].

IP/15: Implementation of Vietnam NOC (Vietnam and Thailand)

3.7. Vietnam and Thailand will continue to coordinate on the implementation of the Vietnam NOC, including development of proposed updates to the APAC ANP and ROBEX Handbook [**ACTION 05**].

3.8. Vietnam and Thailand will also continue to coordinate on the implementation by Vietnam of IWXXM.

WP/06: Current status and plan of IWXXM implementation in Indonesia (Indonesia)

3.9. Indonesia has developed and implemented the capability to produce OPMET information in IWXXM form by translation from TAC form and to exchange IWXXM (domestically) via AMHS networks.

3.10. When testing the exchange of meteorological information in IWXXM form, ICAO guidelines* indicate that States should ensure the IWXXM schema incorporates the appropriate non-operational flags. Non-operational messages may be classified as either being related to TEST or EXERCISE.

3.11. Singapore is coordinating with Indonesia on the development of a regional trial of IWXXM data exchange between Indonesia and relevant agencies.

3.12. The MET/IE WG will need to consider how best to support APAC States with coordinating and sharing information on their IWXXM exchange testing activities [**ACTION 09**].

IP/02: Status and plans for implementation of IWXXM in Thailand (Thailand)

3.13. Thailand is capable of generating METAR, SPECI, TAF and SIGMET in IWXXM form, in parallel with Traditional Alphanumeric Code (TAC) form, and exchanging the IWXXM messages internally between the Bangkok ROC and Thailand NOC using AMHS with File Transfer Body Part (FTBP) through VPN. The Bangkok ROC will test the exchange of IWXXM version 3.0.0 messages with the NOCs in its area of responsibility and with other ROCs from August 2020.

* *Guidelines for the Implementation of OPMET Data Exchange using IWXXM*, Third Edition - May 2019, para. 6.1 and 6.1.1

IP/03: Status and Plans for IWXXM in Australia (Australia)

3.14. Australia is currently generating, or will soon be capable of generating, AIRMET, SIGMET, VAA, TCA and SWXA reports in IWXXM version 3 format from source and METAR/SPECI and TAF bulletins in IWXXM version 3 format converted from TAC. By November 2020, RODB Brisbane will be capable of disseminating the IWXXM messages via AMHS/FTBP connections with RODBs Singapore and Nadi. Future plans include the full support of IWXXM exchange at RODB Brisbane, including storage, retrieval, statistics and requests/reply – and may include translation functions (if required).

IP/04: Status of IWXXM in New Zealand (New Zealand)

3.15. New Zealand is planning to generate SIGMET and VAA (and TCA as backup for TCAC Nadi) in IWXXM form from source and METAR translated into IWXXM form from TAC. The generation of TAF in IWXXM form is still to be determined. New Zealand is planning to test the dissemination of TAF and METAR in IWXXM form from the end of July to the RODBs using an extended AMHS connection from New Zealand via Salt Lake City.

IP/05: Plans for IWXXM in Japan (Japan)

3.16. Japan's schedule for implementation of IWXXM has been postponed due to the impacts of the COVID-19 pandemic. From late March 2021, Japan plans to disseminate TAF, METAR, SIGMET, TCA and VAA in IWXXM ver. 3.0 form (TCA and VAA in IWXXM ver. 2.1.1 form might be shared on the internet web-page in advance). Japan has implemented AMHS with FTBP internally and will implement or test its international connectivity with United States, Hong Kong China and Singapore in September or October 2020 and then with China and Republic of Korea in late 2020 and early 2021.

IP/16: Status and Plans for IWXXM in Hong Kong, China (Hong Kong, China)

3.17. Hong Kong China started generating METAR/SPECI, TAF and SIGMET in IWXXM version 3.0 from source data in July 2020, for internal reliability test. Hong Kong Regional OPMET Centre (ROC) is also ready to perform the function of "Data Translation Centre" for METAR/SPECI and TAF from TAC to IWXXM version 3.0 on behalf of upstream NOCs as necessary subject to mutual agreement. Hong Kong ROC will upgrade its AMHS to support IWXXM message exchange and commence trials of IWXXM exchange over AMHS with the communication (COM) centres of Fukuoka, Manila, Macao and Taipei starting from early September 2020.

IP/17: Status and Plans for IWXXM in Singapore (Singapore)

3.18. Singapore has been progressing well with IWXXM testing and implementation and, despite setbacks due to the impacts of the COVID-19 pandemic, expects to meet ICAO's requirements for IWXXM data exchange in November 2020. Singapore will conduct a coordinated intra-regional testing between IROGs/Regional OPMET Centres over AMHS and will test the translation (TAC to IWXXM) of locally generated messages as well as messages received from other States in the region. Singapore will use translation as the primary mode of IWXXM message generation, and progressively operationalise direct generation of IWXXM messages from source.

IP/06: Enhancement of SIGMET Coordination Platform with IWXXM (Hong Kong, China)

3.19. Hong Kong China provides a web-based platform to interested States to support international SIGMET coordination efforts. Hong Kong China has enhanced its SIGMET coordination platform to support the generation of SIGMET for thunderstorm and volcanic ash in IWXXM version 3.0 form.

Future enhancements of the system will also support the generation of SIGMET for tropical cyclone, turbulence and icing in IWXXM version 3.0 form.

IP/19: Status and Plans for IWXXM in Fiji (Fiji)

3.20. Fiji's schedule for planning and implementation of IWXXM has been delayed due to the impacts of the COVID-19 pandemic and, therefore, it now anticipates to implement the necessary upgrades to its system by the 3rd quarter of 2021.

IP/20: Current Status and Plans of MET Information Exchange of Mongolia (Mongolia)

3.21. Mongolia uses AFTN for international exchange of meteorological bulletins. Mongolia cannot install the system upgrades necessary to support IWXXM for the exchange of meteorological information due to the current social and economic impact of COVID-19 pandemic. The implementation timeframe for IWXXM in Mongolia is uncertain.

General Discussion: APAC Regional IWXXM implementation

3.22. Some States, such as China (including Hong Kong China), Indonesia and Singapore indicated they are able or are planning to offer other States TAC-to-IWXXM translation functions, subject to mutual agreement between the States/units concerned, e.g., Beijing ROC and Hong Kong ROC can provide TAC-to-IWXXM translation service for OPMET data disseminated by upstream NOCs.

3.23. With respect to continuing delays, beyond November 2020, to the implementation by States of the necessary IWXXM-capabilities, especially at the key units in the ROBEX scheme and in particular the APAC ROCs & RODBs, the impacts on the ability of the ROBEX scheme to support the exchange of IWXXM messages in the APAC Region is likely to be significant.

WP/07: Webinar on the Implementation of IWXXM and AMHS (Secretariat)

3.24. To support States with the implementation of IWXXM, including the mechanism identified by ICAO to enable States to exchange information in IWXXM form; the Extended AMHS, ICAO and the MET/IE WG are developing a plan for an ICAO APAC 2020 webinar on the implementation of IWXXM and Extended AMHS.

3.25. The plan includes an online survey on the status of planning and implementation by States of IWXXM and Extended AMHS, including States' requirements for assistance in the form of a webinar.

3.26. To support ICAO, in conjunction with the MET/IE WG, with the organization and planning of the proposed webinar to provide States with further technical assistance to facilitate the implementation of IWXXM and Extended AMHS, the meeting participants will ensure their States respond to the online survey questionnaire at the link provided in WP/07 (and in State Letter Ref: T 4/3.2.5- AP155/20 (MET)) by 7 August 2020 [**ACTION 10**].

3.27. With regards to the network bandwidth requirements to support the dissemination and exchange of IWXXM messages, this will depend on the volume of data communicated on a State's network. As such, each State will need to determine its bandwidth requirements and ensure sufficient bandwidth is available. A key consideration for States is the increase in data volume by sending IWXXM messages is approximately eleven-times (11x) the data size of TAC messages. Therefore, States will need to assess their data volumes and capacity to ascertain suitable links speeds.

3.28. In view of the matters discussed above, and taking into consideration the considerable information collated from previous IWXXM workshops and related activities, the Secretariat and MET/IE WG will prepare and publish an “FAQ”-type resource to support States at the upcoming, proposed webinar and update the FAQ information after the webinar for the benefit of future IWXXM implementation support activities [**ACTION 11**].

WP/05: Global Repository for IWXXM State Extensions (METP WG-MIE)

3.29. To benefit from the extensibility of GML, States are permitted to provide complementary information to the content of an IWXXM document with the addition of an extension. The use of such an extension shall not prevent the proper validation and exchange of the IWXXM document. A State using an extension to provide complementary information will need to make the extension schema definitions (i.e. xsd) available for other States understand the content.

3.30. Notwithstanding the ICAO guidelines that discourage the use of “extensions” within the IWXXM, the meeting supported the concept proposed in WP/05 for a Global repository of parameters pertaining to the use by States of extensions within IWXXM formatted meteorological information and the requirement for those States concerned to share the following basic information via the proposed repository:

- URL to the (concerned) State’s schema extension definitions;
- High level description of the extension; and
- Contact details of the national focal point (for the extension).

3.31. The meeting noted that specific details were yet to be confirmed concerning the custodianship or hosting by ICAO of the proposed repository.

3.32. Furthermore, the meeting noted that, consistent with the purpose of IWXXM, which is to provide far greater information to the users and system developers than TAC messages, the scope of the proposal in WP/05 is specifically limited to a repository for the parameters pertaining to the extensions used within IWXXM messages only.

3.33. The meeting noted the proposed repository would not apply in any way to “extensions” that some States might use within TAC messages. The use of extensions within TAC messages would represent differences with respect to the Standards in Annex 3 and, as such, any State concerned would be required to notify ICAO by filing the said differences.

4. Agenda Item 4 Guidance material related to meteorological information exchange

WP/08: ROBEX Handbook Updates (Secretariat)

4.1. The MET/IE WG has a role in reviewing and updating the ROBEX Handbook on an annual basis.

4.2. The meeting endorsed the proposed updates to the Focal Point information in the ROBEX Handbook, Appendix I, as presented in WP/08, and proposed additional updates based on input from Australia, China and New Zealand, and requested the Secretariat to prepare the updates in the ROBEX Handbook for approval by MET SG/24 [**ACTION 12**].

4.3. Additional proposed updates to the METAR and TAF bulletin information in the ROBEX Handbook, Appendices A and B, concerning Thailand, were also addressed to the meeting in a separate paper (WP/09).

4.4. In relation to the above, the meeting noted that the current process of MET/IE WG to update the ROBEX Handbook on an annual basis did not reflect OPMET changes made by States in a sufficiently responsive and timely manner (especially with respect to updates to Appendices A and B of the ROBEX Handbook). Therefore, the MET/IE WG will consider 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 [**ACTION 13**].

4.5. Also in relation to the above, the meeting considered the possibility to further update the ROBEX Handbook to facilitate the Regional exchange of OPMET in IWXXM form. The development of new IWXXM-related ROBEX information, such as the addresses for the required dissemination of IWXXM messages by States and the capabilities of the ROBEX scheme for transmitting IWXXM messages, would also need to be flexible to reflect the changing requirements of States, especially during the transition to Region-wide implementation of IWXXM exchange.

4.6. In view of the discussion above, the MET/IE WG will 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 [**ACTION 14**].

4.7. The MET/IE WG will also propose updates, as necessary, to the ROBEX Handbook to reflect APAC States' requirement for flexibility of the ROBEX scheme structure during the transition to Region-wide implementation of IWXXM exchange [**ACTION 15**].

WP/09: Update to the ROBEX Handbook (Thailand) and WP/15: Updates to ROBEX Handbook (Australia)

4.8. The meeting endorsed the proposed updates to the METAR and TAF bulletin information in the ROBEX Handbook, Appendices A and B, concerning Thailand and Australia, as presented in WP/09 and WP/15, and requested the Secretariat to prepare the updates in the ROBEX Handbook for approval by MET SG/24 [**ACTION 16**].

WP/10: Revised and Harmonized OPMET Notification Procedure (Chair MET/IE WG)

4.9. Currently the European and Asia Pacific procedure for notifying of changes to OPMET bulletins (METNO) are different. WP/10 proposes to harmonise the EUR and APAC METNO procedures with a broader aim of having a globally harmonised procedure.

4.10. The meeting supported the proposal in WP/10 to align the *Changes to OPMET Bulletin Procedures*, or "METNO" procedures, as described in the APAC ROBEX Handbook, para. 12.1 and Appendix E, with the equivalent procedures in the ICAO EUR Region.

4.11. The regional focal point or 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.

4.12. The Chair MET/IE WG and Secretariat will coordinate further development of the METNO procedures (wording and mechanisms) as proposed in WP/10, including the scheduled time for implementing OPMET Bulletin changes in the APAC Region, and develop the associated proposal to update the ROBEX Handbook for possible approval by MET SG/24 [**ACTION 17**].

WP/11: Location of FASID Tables (Australia)

4.13. When APANPIRG endorsed the new format for the APAC ANP, based on June 2014, ICAO Council approved common template to be used for Regional ANPs, a number of tables and charts from the FASID in the legacy ANP did not migrate into the new format of the ANP.

4.14. To provide States with access to required up to date information, previously contained in the legacy FASID Tables and not replicated in the ANP, the meeting supported the proposal in WP/11 to incorporate the legacy FASID Tables into existing APAC regional guidance

4.15. In view of the above, the MET/IE WG formulated the following Draft Decision for consideration and possible adoption by MET SG/24:

Draft Decision MET/SG/24/x: Updates to legacy FASID Table information

That, ICAO and States update and incorporate the required information from the legacy Facilities and Service Implementation Document (FASID) Tables relating to meteorology, into existing ICAO APAC regional guidance documentation as follows:

FROM: Legacy FASID Table

Table MET 2A - OPMET Information (METAR, SPECI and TAF) Required in SADIS and WIFS

Table MET 3A - Tropical cyclone advisory centres

Table MET 3B - Volcanic ash advisory centres

Chart MET 1 - Areas of Responsibility of the TCACs

Chart MET 2 - Map of Areas of Responsibility of VAAC and Corresponding FIR

TO: Existing APAC regional guidance

APAC ROBEX Handbook

APAC Regional SIGMET Guide

APAC Regional SIGMET Guide

APAC Regional SIGMET Guide

APAC Regional SIGMET Guide

4.16. The Secretariat in conjunction with input from States will 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 as listed at above [ACTION 18].

4.17. The Secretariat in conjunction with input from States concerned will propose updates to the APAC ANP (Table MET I-1) to reflect the current requirements for State Volcano Observatories. [ACTION 21].

WP/16: Introduction of the Fourth Global Space Weather Information Provider (China)

4.18. The ICAO Council, at its Seventh Meeting of its 219th Session, agreed that the China/Russian Federation consortium (CRC) serve as a global space weather information service provider, and noted that the integration of the consortium into the global network of service providers should be undertaken as seamlessly and efficiently as possible.

4.19. The MET/IE WG will need to update the ROBEX Handbook in due course to include appropriate references to Space Weather Advisories and their corresponding WMO headers, based on further advice from the ICAO MET Panel reflecting the requirements for the global network of service providers.

4.20. Some testing of the dissemination of SWA will be necessary, and this would be coordinated with the ICAO Space Weather Centre Coordination Group.

WP/12: Updates to Australia's MWOs (Australia)

4.21. Australia recently restructured its Aviation Meteorological Service provision to establish three Meteorological Watch Offices (MWOs) in Australia.

4.22. The Secretariat will incorporate the required changes related to Meteorological Watch Offices (MWOs) in Australia in the APAC Regional SIGMET Guide, Appendices C, D and E, and in the legacy FASID Table MET 3A and 3B information (refer to para. 4.11 and 4.12, above), as proposed in WP/12 [**ACTION 22**].

5. Agenda Item 5: Future work programme and terms of reference of MET/IE WG**WP/13: Review MET/IE WG Terms of Reference and Work Programme (Secretariat)**

5.1. The terms of reference and work programme of the MET/IE WG were last updated based on proposals by the previous meeting of the group; MET/IE WG/17, 11 - 13 March 2019. The Twenty-Third Meeting of the Meteorology Sub-Group (MET SG/23), 17 - 20 June 2019, reviewed the work plan of all the ICAO APAC working groups under the MET SG and requested the working groups to conduct a coordinated review and update of the terms of reference and work plans to realign the working groups with the work plan of the MET SG.

5.2. As follow-up, the respective Chairs of the working groups proposed, inter-alia, that the MET/IE WG terms of reference should be updated to specifically include references to IWXXM and SWIM in relation to facilitating digital aeronautical meteorological information exchange and SWIM in relation to the development of regional guidance material.

5.3. The meeting endorsed, and slightly modified, the proposed updates to the terms of reference document proposed by the MET working groups' Chairs' and as presented in WP/13, to include specific references to IWXXM and SWIM. In addition, the meeting noted several updates to the MET/IE WG membership contact details as presented in WP/13 or as provided directly by the meeting participants.

5.4. The meeting also recalled the discussion and reaffirmed the associated agreed action earlier in the meeting (refer to para. 2.4.) concerning the proposal of updates to the terms of reference to reflect the desirable deadlines, as adopted by the MET SG, for submission and publication of meeting papers and reports.

5.5. The Secretariat will include the above proposed updates in the terms of reference document for inclusion in the meeting report for further review and approval by MET SG/24 [**ACTION 03**]. The updated MET/IE WG terms of reference is at the **Appendix B** to this Report.

5.6. The Secretariat and Members of the MET/IE WG will further update the work programme document after the meeting, to reflect the outcomes of the meeting discussions and for inclusion in the meeting report for further review and approval by MET SG/24 [**ACTION 05**]. The updated MET/IE WG work programme is at the **Appendix B** to this Report.

6. Agenda Item 6: Regional tests of Advisory and SIGMET services**WP/14: Results of SIGMET Tests 2019 – WC and WV (JAPAN)**

- 6.1. Results from the APAC tests of SIGMET information concerning tropical cyclone and volcanic ash on 13 and 20 November 2019, identified a number of issues concerning the dissemination and/or reception of SIGMET messages, incorrect use of priority and/or header information and use of coding in the messages, as presented in WP/14.
- 6.2. The Secretariat will ensure ICAO disseminates the invitation letter to States two-months in advance of the annual SIGMET test and a follow-up reminder email message approx. two-weeks prior to the first day of the test [**ACTION 24**].
- 6.3. The MET/IE WG will continue to analyse the SIGMET test results, work with States concerned to identify root causes for non-participation or non-compliance, and identify appropriate corrective actions for the States concerned, and in conjunction with the MET/S WG develop an action plan to assist those States with rectification of the SIGMET-related errors and deficiencies [**ACTION 25**].
- 6.4. The Secretariat will inform, by ICAO State letter, the States concerned of the SIGMET-related errors and deficiencies identified by the annual SIGMET test as presented in WP/14 and urge the States concerned to take the proposed corrective actions [**ACTION 26**].
- 6.5. The Annex 3 template for SIGMET (and AIRMET) messages, Table A6-1A, includes the status indicator “TEST” or “EXER”, which enables States to disseminate non-operational SIGMET test messages whenever necessary to indicate that a test or an exercise is taking place.
- 6.6. In view of the above, the action plan referred to in para. 6.3 should utilize the SIGMET “TEST” provision, as necessary, as part of the corrective actions by States to rectify the SIGMET-related errors and deficiencies [**ACTION 25**].
- 6.7. The meeting was reminded that SIGMET “TEST” provision enables States to conduct tests whenever necessary to verify the required dissemination of SIGMET information.

WP/27: Review of WS SIGMET Test 15 (Singapore)

- 6.8. Results from the APAC test of SIGMET information concerning phenomena other than tropical cyclone and volcanic ash on 27 November 2019, identified a number of issues concerning the dissemination and/or reception of SIGMET messages, as presented in WP/15.
- 6.9. The Secretariat will inform, by ICAO State letter, the States concerned of the SIGMET-related errors and deficiencies identified by the annual SIGMET test as presented in WP/27 and urge the States concerned to take proposed corrective actions [**ACTION 26**].
- 6.10. To facilitate rectification of the SIGMET-related dissemination deficiency in Mongolia, as identified in the SIGMET test results in WP/27, Singapore will support Mongolia with conducting a follow-up SIGMET test. Singapore will share with the MET/IE WG and MET/S WG the results of Mongolia’s follow-up SIGMET test [**ACTION 27**].
- 6.11. The MET/IE WG and MET/S WG will extend the action plan (discussed at para. 6.3, above) to assist the States concerned with rectification of the SIGMET-related errors and deficiencies identified in WP/27, and conducting a state-specific SIGMET test to assess whether the corrective actions have been successful [**ACTION 25**].
- 6.12. The reception of SIGMET test messages at Regional OPMET Centre (ROC) London was low compared to APAC RODB's. The MET/IE WG will investigate the reason for this reduction and share the results with MET/S for potential corrective action [**ACTION 28**].

6.13. Sri Lanka informed the meeting that the relevant operational unit/s did not receive the required information on the APAC SIGMET test. The Secretariat will request Sri Lanka to provide ICAO with the appropriate contact details to ensure the SIGMET test invitation is received by the participating MWO [ACTION 24].

6.14. To further facilitate the effective participation of all APAC RODBs in the annual SIGMET test, the Secretariat will inform Fiji, by ICAO State letter, of the incomplete data provided by RODB Nadi to the SIGMET test focal point in Singapore and lack of participation in the OPMET monitoring activities [ACTION 26].

7. **Agenda Item 7: Outcomes from MET/S WG related meetings**

WP/17: Follow-up Action from MET/S WG/9 (Secretariat)

7.1. The previous meeting (MET/S WG/9), generated a Task List of five (5) new action items for follow-up by members of the MET/S WG, in addition to the two (2) outstanding action items carried over from previous meetings. The meeting agreed to the proposed updates to the MET/S WG Task List as presented in WP/17.

7.2. With respect to the outstanding action item (no. 8) presented in WP/17, Appendix A, concerning promoting the issuance of special air-reports, the MET/R WG/9 recently adopted a similar action (no. 9/1). The Secretariat will continue to coordinate the required follow-up action with the MET/R WG [ACTION 31] and the meeting agreed to update the status of the outstanding action item (no. 8) to “completed”.

7.3. The meeting recalled the discussion and associated action agreed earlier in the meeting (at para. 2.2.) related to facilitating the progress on follow-up actions by the working groups through conducting regular online coordination meetings [ACTION 01].

7.4. With respect to a previous action by the MET/S WG to provide States with access, via the ICAO APAC Office website, to the SIGMET information educational pamphlets produced by Australia in collaboration with Hong Kong China, Japan and New Zealand, the meeting noted, while the MET/S WG had previously updated the pamphlets to align with the provisions in Amendment 77 to Annex 3, they are no longer up to date with the subsequent Amendments 78 and 79 to Annex 3.

7.5. In view of the above, the MET/S WG will consider the States’ requirements for, and the viability of producing further updated versions of the SIGMET pamphlets [ACTION 23].

7.6. In the meantime, the Secretariat will remove the outdated SIGMET pamphlets from the ICAO APAC Office website [ACTION 23].

8. **Agenda Item 8: Monitoring of meteorological services**

WP/18: Activities of the PIAWS Panel Task Team (PIAWS Panel TT)

8.1. The Pacific Islands Aviation Weather Services (PIAWS) Panel, and PIAWS Task Team, is assisting Pacific States in resolving (APANPIRG) air navigation deficiencies and in meeting the 5 November 2020 applicability of the Standards for IWXXM format, as presented in WP/18.

8.2. As an outcome of its assistance work related to deficiencies in the provision of volcanic ash information, the Task Team identified an absence of designated State volcano observatories in some APAC States that have active or potentially active volcanoes.

8.3. The MET/S WG will designate an ad-hoc group consisting of the Secretariat and members from the VAACs and RODBs to identify the APAC States with active or potential active volcanoes, which do not have a designated State volcano observatory listed in the APAC ANP, Vol I, Table MET I-1. The Secretariat will then conduct the necessary coordination to facilitate the States concerned with the designation of a State volcano observatory and listing it in the APAC ANP [ACTION 21].

8.4. The Secretariat will also coordinate the action above with the development of a comprehensive proposal for amendment of the APAC ANP, Vol I, Table MET I-1, to reflect APAC States' current requirements for State volcano observatories [ACTION 21].

8.5. The meeting endorsed, and congratulated the PIAWS Panel Task Team on, the work to assist the Pacific Island States in the resolution of (APANPIRG) air navigation deficiencies in the field of aeronautical meteorology. The MET/S WG may take the experience and lessons learned from this valuable work to support and enhance the MET/S WG activities to assist other States with the resolution of air navigation deficiencies.

WP/19: Proposals to Expand SIGMET Coordination Activities (Indonesia)

8.6. Indonesia's MWO conducted coordination of SIGMET information concerning thunderstorms between MWOs in neighbouring States, in full operational and trial phase, as presented in WP/19.

8.7. The meeting congratulated Indonesia and its neighbouring States, as well as the States supporting the implementation of operational SIGMET coordination and the development of trial SIGMET coordination activities across Indonesia's international boundaries.

8.8. The MET/S WG will consider the proposals presented in WP/19 as part of its developments on the work programme to promote APAC States' integration and expansion of SIGMET coordination activities [ACTION 29].

WP/20: SSEA SIGMET Coordination (Hong Kong China, Indonesia and Sri Lanka)

8.9. A trial coordination of SIGMET information concerning thunderstorms between the MWOs of Indonesia and Sri Lanka, and supported by Hong Kong, China, from 2 December 2019 to 1 June 2020, generated a total number of nineteen (19) cases where the MWOs considered the coordination of SIGMET information was "successful" and only five (5) cases in which the MWOs did not reach a "consensus" on the SIGMET information. Noting the positive outcomes from the project, the participants agreed to transition to semi-operational status.

8.10. The meeting noted that Hong Kong, China will continue to support the SSEA SIGMET coordination project and offers to support other MWOs within the APAC Region that are interested in coordination of SIGMET information in compliance with Amendment 79 to Annex 3.

8.11. MET/S WG will consider the results of the SIGMET coordination project presented in WP/20 when developing its work programme on coordinating the next steps to promote integration and expansion of SIGMET coordination activities in the APAC Region [ACTION 29].

WP/21: Collaborative SIGMET Coordination Table-top Exercise (CHN, HKC, PHL, VATM)

8.12. Participants of a “table-top” exercise on coordination of SIGMET information concerning tropical cyclone between four (4) MWOs in China, Hong Kong China, Philippines and VATM, drafted a proposed “Supplementary Practice in TC-related SIGMET Coordination” based on experience gained in the exercise.

8.13. The meeting noted that, from 5 November 2020, an MWO should coordinate SIGMET with neighbouring MWO(s), especially when the en-route weather phenomenon extends or is expected to extend beyond the MWO’s specified area of responsibility, in order to ensure harmonized SIGMET provision. Furthermore, SIGMET messages concerning volcanic ash cloud and tropical cyclones should be based on advisory information provided by VAACs and TCACs, respectively, designated by regional air navigation agreement.

8.14. The airline users place a priority on the accuracy and consistency of meteorological information and therefore consider it essential that MWOs base SIGMET information on the advisory information and ensure that any additional information from an MWO will feedback to the advisory centre, as necessary, to support the ongoing accuracy and consistency of meteorological information.

8.15. Therefore, the meeting considered that, as best practice, MWOs should maintain close coordination with VAACs and TCACs on information relating to volcanic ash and tropical cyclone, and when an MWO has additional information relating to volcanic ash or tropical cyclone the MWO should forward the information without delay to the relevant VAAC or TCAC to supplement their information sources.

8.16. In relation to the discussion, airline users consider efforts to improve the guidance for MWOs on the issuance of SIGMET information concerning thunderstorms, icing and turbulence will further support improved accuracy and consistency of meteorological information.

8.17. The MET/S WG has a role in coordinating the next steps to promote integration and expansion of (APAC) MWOs’ SIGMET coordination activities. Considering the provisions already in place that effectively provide for the coordination by MWOs of SIGMET messages concerning tropical cyclones (and volcanic ash clouds), the MET/S WG should focus on the identified needs of States for improved harmonization of SIGMET information concerning thunderstorms, including thunderstorms associated with cumulonimbus cloud information in advisory information, or other weather and phenomena in the atmosphere, which is not based on advisory information produced by TCACs (and VAACs).

WP/22: Recent progress of CSI (Japan, Lao PDR, Myanmar, Philippines, Thailand, Vietnam)

8.18. The [participants of the] ongoing scheme known as Collaborative SIGMET Issuance (CSI), conducted by Japan, Lao PDR, Myanmar, Philippines, Thailand and Vietnam, reported their recent activities, especially the result of the CSI Workshop held in December 2019. The CSI member States agreed to continue to consider the definition of consensus, their challenges about issuance of WC SIGMET and so forth.

8.19. The [CSI] participants identified the need by MWOs of special air-reports as an important source of information to support the issuance of SIGMET information concerning turbulence and icing and proposed to discuss plausible ways to encourage airlines and ATS units to share more special air-reports to the associated MWOs. [Previously,] MET/R WG/9 agreed to publicize by way of ICAO State letter (and/or other channels) the importance of exchanging special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices).

8.20. Furthermore, the CSI member States had a joint session with Operational SIGMET coordination project members and other relevant members and agreed to conduct the three one-to-one coordination trials using the Japan Meteorological Agency (JMA) web tool.

8.21. Noting the outcome from the CSI Workshop, the meeting supported the MET/R WG/9 action concerning an ICAO State letter to highlight to States of the importance of exchanging special air-reports among airlines, ATS units and MWOs (and aerodrome meteorological offices) [ACTION 31] and formulated the following Decision:

Decision MET/S WG/10/1: Encourage airlines and ATS units to share more special air-reports to the associated MWOs

That, MET/S WG supports the agreed action at MET/R WG/9 (Action 9/1) that invites ICAO to publicise by way of State letter (and/or other channels) the importance of exchanging special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices)

IP/07: Update of GHSV SIGMET Coordination Project (CBD, CHN, HKC and VNM)

8.22. Coordination of SIGMET information concerning thunderstorms between MWOs in Cambodia, China, Hong Kong China and Vietnam in 2019 included a total number of three-hundred and forty-five (345) cases in which 80% percent of cases the MWOs concerned were able to reach a “consensus” on the coordination of SIGMET within 15-minutes.

IP/08: Wellington and Darwin VAAC Back-up (New Zealand)

8.23. On 30 January 2020, a partial systems outage in VAAC Wellington resulted in the provision of back-up services by VAAC Darwin. While users have confirmed receipt of volcanic ash advisory messages sent by Darwin on behalf of Wellington during the back-up, an earlier back-up test between VAACs Darwin and Wellington in February 2019 identified an issue within the VAAC’s dissemination systems, related to the use of the NZKL location indicator in the advisory messages.

8.24. The MET Panel, Working Group Meteorology Operations Group, International Airways Volcano Watch Work Stream has agreed (METP WG-MOG/11 IAVW, refers) that VAACs will completely mimic the WMO header and location indicator of the VAAC they are providing back-up service for, to ensure receipt of the VAAC back-up VAAs by all downstream user systems.

8.25. The MET/IE WG has an existing work programme activity to review and update the VAAC back-up test procedures (annually) The two working groups will refer to the pertinent information from IP/08 and determine appropriate action for the next review and update of the VAAC back-up test procedures [ACTION 30].

IP/09: Newly established aerodrome meteorological stations in Indonesia(Indonesia)

8.26. Two newly established aerodrome meteorological stations in Indonesia provide meteorological information for Raja Sisingamaraja XII airport, located in Siborongborong, North Sumatera Province, and Yogyakarta International airport, located in Kulonprogo, Yogyakarta Province.

8.27. The Secretariat will liaise further with Indonesia to determine any requirement to update the ICAO APAC ANP and/or ROBEX Handbook [ACTION 20].

IP/10: Development of a Now-casting System for Terminal Airspace (Singapore)

8.28. Singapore has embarked on the development of a multi-input, high resolution now-casting system, to meet users' needs for high resolution weather forecasts of thunderstorms in the terminal airspace, in parallel with the development of a now-casting system based primarily on meteorological satellite data to support the wider, en-route aeronautical operations.

IP/18: The progress of MET-ATM Coordination in CDM (China)

8.29. China is utilizing detailed case study on the effectiveness of MET-ATM collaboration at one of its busiest terminal areas during severe thunderstorms and heavy rain in order to improve the meteorological services provided for collaborative decision making in air traffic flow management and minimize the impacts of adverse weather on air traffic capacity.

9. Agenda Item 9: Deficiencies in the provision of meteorological services**WP/23: Review of Air Navigation Deficiencies in the MET Field (Secretariat)**

9.1 The list of APANPIRG air navigation deficiencies in the MET field currently contains fourteen (14) open deficiencies related to facilities and services in nine (9) Asia/Pacific States, as presented in WP/23.

9.2 The PIAWS Panel is currently assisting the Pacific Island States, including Solomon Islands and Tonga, with developing and implementing corrective action for the resolution of air navigation deficiencies concerning aerodrome meteorological observations or reports, MWO and/or SIGMET information, volcanic ash/activity information and WAFS forecasts and/or flight briefings.

9.3 Tonga, in collaboration with VAAC Wellington, is utilizing the volcanic ash exercises to support the resolution of Tonga's air navigation deficiencies concerning volcanic information.

9.4 In addition, the Secretariat will continue to support States, as necessary, such as Nepal, with developing and implementing their corrective action plans for the resolution of air navigation deficiencies [ACTION 32].

IP/11: Uplifting Observations and Forecasting Capacity in Papua New Guinea (Australia)

9.5 Australia is supporting Papua New Guinea to uplift its capacity to provide the meteorological observations and forecasts necessary to support Papua New Guinea's aviation weather services provision. The support extends to areas including liaison with aviation stakeholders, automated meteorological observation systems, access to numerical weather prediction systems, volcanic ash observations and the competencies, education and training of meteorological personnel.

10. Agenda Item 10: Guidance and education related to the provision of meteorological services**WP/24: Update to Regional SIGMET Guide (Ad-hoc Group)**

10.1 The MET/S WG has a role in reviewing and updating the APAC Regional SIGMET Guide. The designated ad-hoc group for this activity, consisting of Australia (rapporteur), New Zealand, Hong Kong China and Japan drafted proposed updates to the SIGMET Guide, as presented in WP/24, to align

with Amendment 79 to Annex 3, fix some minor typographical errors and improve and replace the appended “SIGMET test” procedure.

10.2 The meeting congratulated the ad-hoc group on its work and supported the proposed updates to the SIGMET Guide, as presented in WP/24. Accordingly, the meeting formulated the following draft decision for possible adoption by MET SG/24:

Draft Decision MET/SG/24/x: Updates to Regional SIGMET Guide

That, the MET SG approves the updates to the SIGMET Guide as presented in WP/24 for use by States and publishing on the ICAO APAC Office website

WP/25: SADIS and WAFS Update (Secretariat on behalf of SADIS Provider)

10.3 Several matters concerning the World Area Forecast System (WAFS) and changes in the operation of the WAFS London operated Secure Aviation Data Information System (SADIS) are of interest to APAC States, as presented in WP/25.

10.4 With respect to improved WAFS data sets aligned with Amendment 79 to Annex 3, including “Turbulence Severity”, “Icing Severity” and cumulonimbus “extent”, “base” and “top”, SADIS user States should make the necessary system changes to integrate the new data into their SADIS user systems and software before the operational implementation date of 4 November 2020.

10.5 With respect to further, significant upgrades planned for WAFS and SADIS in November 2023, the MET/S WG will develop appropriate actions in its work programme to facilitate States’ awareness of and planning for the proposed WAFS and SADIS changes [**ACTION 33**].

IP/12: Three-hourly Update of Aerodrome Forecasts (Australia)

10.6 Australia is planning the implementation of an Aerodrome Forecast (TAF) service with routine update frequency increased from six-hourly to three-hourly at its major civil and military airports. This new service (referred to as TAF3) will replace Australia's current Trend Forecast (TTF) service, which is not as widely used by international operators as the TAF. This change should therefore provide an improved service for the wider group of international operators.

IP/13: VAAC Darwin Management Report (Australia)

10.7 The report from the Volcanic Ash Advisory Centre (VAAC) Darwin covering the period 1 July 2019 to 30 June 2020 provides an update on current VAAC Darwin activities, significant operational changes, training and development, collaboration and stakeholder engagement.

IP/14: VAAC Tokyo Management Report (Japan)

10.8 Japan presented the VAAC Tokyo Management Report, highlighting the significant events, operational changes, back-up arrangements, volcanic ash exercises and Regional cooperation activities in the period from 1 March 2019 to 30 June 2020 and future planned developments.

VAAC Wellington Management Report (New Zealand)

10.9 **Note:** New Zealand will present a report to MET SG/24

11. Agenda Item 11: Future work programme and terms of reference of MET/S WG**WP/26: Review MET/S WG Terms of Reference and Work Programme (Secretariat)**

11.1. The terms of reference and work programme of the MET/S WG were last updated based on proposals by the previous meeting of the group; MET/S WG/9, 13 – 15 March 2019. The Twenty-Third Meeting of the Meteorology Sub-Group (MET SG/23), 17 - 20 June 2019, reviewed the work plan of all the ICAO APAC working groups under the MET SG and requested the working groups to conduct a coordinated review and update of the terms of reference and work plans to realign the working groups with the work plan of the MET SG, including update the work plan of MET/S WG to coordinate with MET/R WG on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.

11.2. As follow-up, the respective Chairs of the working groups proposed, inter-alia, that the MET/S WG terms of reference should be updated to specifically include references to ASBUs and SWIM in relation to implementation of meteorological services and the inclusion of references to the Volcanic Ash Exercises Steering Group (VOLCEX/SG). In addition, the Chairs proposed inclusion of a new activity and deliverables in the MET/S WG work programme on the next steps to promote integration and expansion of SIGMET coordination activities.

11.3. The meeting endorsed, and slightly modified, the proposed updates proposed by the MET working groups' Chairs' and as presented in WP/26, to update the membership of the MET/S WG's designated ad-hoc groups to do the work related to SIGMET coordination and updates to the SIGMET Guide.

11.4. The Secretariat will include the above proposed updates in the terms of reference document for inclusion in the meeting report for further review and approval by MET SG/24 [**ACTION 04**].

11.5. The meeting also recalled the discussion and reaffirmed the associated agreed action earlier in the meeting (refer to para. 2.4.) concerning the proposal of updates to the terms of reference to reflect the desirable deadlines, as adopted by the MET SG, for submission and publication of meeting papers and reports [**ACTION 02**].

11.6. The Secretariat and Members of the MET/S WG will further update the terms of reference and work programme document after the meeting, to reflect the outcomes of the meeting discussions and for inclusion in the meeting report for further review and approval by MET SG/24 [**ACTION 06**]. The updated MET/S WG terms of reference and work programme is at the **Appendix C** to this Report.

Next meetings

11.7. The Meteorology Subgroup, at its next meeting (MET SG/24), will further consider and decide the schedule for the future meetings of the MET/IE WG and MET/S WG, which have previously convened on an annual basis, back-to-back, during March.

MET/IE WG/18 & MET/S WG/10
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TASK LIST

MET/IE WG/18 and MET/S WG/10

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	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	Work in progress
02	Terms of Reference and Work Program – meeting documentation deadlines: Propose updates to the terms of reference documents to reflect the desirable deadlines, as adopted by the MET SG, for submission and publication of meeting papers and reports (i.e., submit papers >=28-days before the meeting, publish papers >=14-days before the meeting and publish reports <=21-days after the meeting) [ref: para. 2.4. and 11.5.]	At MET SG/24	Secretariat and WG Chairs	Ref: MET/IE WG and MET/S WG, 3. Communication Strategies
03	Terms of Reference updates – MET/IE WG: Include the proposed updates (at para. 5.1-5.4 of the report) in the terms of reference document for inclusion in the meeting report for further review and approval by MET SG/24 [ref: para. 5.5.]	Before MET SG/24	Secretariat	Ref: MET/IE WG, 1. Membership and 2. Description
04	Terms of Reference updates – MET/S WG: Include the proposed updates (at para. 11.1-11.3 of the report) in the terms of reference document for inclusion in the meeting report for further review and approval by MET SG/24 [ref: para. 11.4.]	Before MET SG/24	Secretariat	Ref: MET/S WG, 1. Membership and 2. Description
05	Work Program – MET/IE WG: Update the work program document to reflect the outcomes of the meeting discussions and for inclusion in the meeting report for further review and approval by MET SG/24 [ref: para. 5.6.]	Before MET SG/24	Secretariat and MET/IE WG	Work in progress
06	Work Program – MET/S WG: Update the work program document to reflect the outcomes of the meeting discussions and for inclusion in the meeting report for further review and approval by MET SG/24 [ref: para. 11.6.]	Before MET SG/24	Secretariat and MET/S WG	Work in progress
OPMET Monitoring				
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	Ref: MET/IE WG, 5. Work Plan, Activity 1 and Activity 2
08	OPMET performance indices – RODBs’ review: Review and propose update/s to the MET/IE WG work program as necessary to ensure the APAC RODBs review the results of the OPMET monitoring activities prior to submission of the results to the MET/IE WG meetings [ref: para. 3.6.]	Before MET SG/24	MET/IE WG	Ref: MET/IE WG, 5. Work Plan, Activity 1 and Activity 2
IWXXM implementation				
09	IWXXM implementation – registering testing activities: Proposal on how best to support APAC States with coordinating and sharing information on their IWXXM exchange testing activities [ref: para. 3.12.]	At IWXXM Webinar	MET/IE WG	Ref: MET/IE WG, 5. Work Plan, Activity 7
10	IWXXM implementation – survey: Respond to the online survey questionnaire at the link provided in WP/07 (and in State Letter Ref: T 4/3.2.5- AP155/20 (MET)) [ref: para. 3.26.]	7 Aug 2020	Meeting participants’ States	Ref: MET/IE WG, 5. Work Plan, Activity 7
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	Ref: MET/IE WG, 5. Work Plan, Activity 7
Regional Guidance Materials				
12	ROBEX Handbook updates – Focal Points: Prepare the proposal to update the ROBEX Handbook based on the proposed updates to the Focal Point information (Appendix I), as presented in WP/08 and proposed by Australia, China and New Zealand [ref: para. 4.2.]	Before MET SG/24	Secretariat	Ref: MET/IE WG, 5. Work Plan, Activity 6

MET/IE WG/18 & MET/S WG/10
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ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
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	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	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	Ref: MET/IE WG, 5. Work Plan, Activity 6
16	ROBEX Handbook updates – METAR and TAF bulletins: Prepare the updates to the Appendices A and B, concerning Thailand and Australia, as presented in WP/09 and WP/15 [ref: para. 4.8.]	Before MET SG/24	Secretariat	Ref: MET/IE WG, 5. Work Plan, Activity 6
17	ROBEX Handbook updates – METNO procedures: Coordinate further development of the METNO procedures (wording and mechanisms) as proposed in WP/10, including the scheduled time for implementing OPMET Bulletin changes in the APAC Region, and develop the associated proposal to update the ROBEX Handbook [ref: para. 4.12.]	Before MET SG/24	Chair MET/IE WG and Secretariat	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	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	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	Ref: MET/IE WG, 5. Work Plan, Activity 6
21	ANP updates – State Volcano Observatories: Designate an ad-hoc group consisting of the Secretariat and members from the VAACs and RODBs to identify the APAC States with active or potential active volcanoes, which do not have a designated State volcano observatory listed in the APAC ANP, Vol I, Table MET I-1; conduct the necessary coordination to facilitate the States concerned with the designation of a State volcano observatory and listing it in the APAC ANP; coordinate the action above with the development of a comprehensive proposal for amendment of the ANP to reflect APAC States' current requirements for State volcano observatories [ref: para. 4.17., 8.3. and 8.4.]	Before MET SG/24	MET/S WG and Secretariat	Ref: MET/IE WG, 5. Work Plan, Activity 6
22	SIGMET Guide updates – MWOs in Australia: Incorporate the required changes related to MWOs in Australia in the APAC Regional SIGMET Guide, Appendices C, D and E, and in the legacy FASID Table MET 3A and 3B information, as proposed in WP/12 [ref: para. 4.22.]	Before MET SG/24	Secretariat	Ref: MET/S WG, 5. Work Plan, Activity 4
23	SIGMET pamphlets – requirements for updates: Consider the States' requirements for, and the viability of producing further updated versions of the SIGMET pamphlets; remove the outdated SIGMET pamphlets from the ICAO APAC Office website [ref: para. 7.5. and 7.6.]	Before MET SG/24	MET/S WG and Secretariat	Ref: MET/S WG, 5. Work Plan, Activity 4
SIGMET test				
24	SIGMET test – notification to States: Disseminate the invitation letter to States two-months in advance of the annual SIGMET test and a follow-up reminder email message approx. two-weeks prior to the first day of the test; request Sri Lanka to provide ICAO with the appropriate contact details to ensure the SIGMET test invitation is received by the participating MWO [ref: para. 6.2. and 6.13.]	Prior to SIGMET test	Secretariat	Ref: MET/IE WG, 5. Work Plan, Activity 3

MET/IE WG/18 & MET/S WG/10
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ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
25	SIGMET test results – corrective action plan: Develop an action plan to assist States concerned with rectification of the (WP/14 and WP/27) identified SIGMET-related errors and deficiencies; the action plan referred should utilize the (Annex 3) SIGMET “TEST” provision to conduct state-specific SIGMET test to assess whether the corrective actions have been successful [ref: para. 6.3., 6.6. and 6.11.]	Before MET SG/24	MET/IE WG in conjunction with MET/S WG	Ref: MET/IE WG, 5. Work Plan, Activity 3 <u>AND</u> Ref: MET/S WG, 5. Work Plan, Activity 3
26	SIGMET test results – follow-up with States: Inform, by ICAO State letter, the States concerned of the SIGMET-related errors and deficiencies identified by the annual SIGMET test as presented in WP/14 and WP/27 and urge the States concerned to take the proposed corrective actions; inform Fiji, by ICAO State letter, of the incomplete data provided by RODB Nadi to the SIGMET test focal point in Singapore and lack of participation in the OPMET monitoring activities [ref: para. 6.4., 6.9. and 6.14.]	Before MET SG/24	Secretariat	Ref: MET/IE WG, 5. Work Plan, Activity 3 <u>AND</u> Ref: MET/S WG, 5. Work Plan, Activity 3
27	SIGMET test results – corrective action plan: Support Mongolia with conducting a follow-up SIGMET test to facilitate rectification of the SIGMET-related dissemination deficiency as identified in the SIGMET test results in WP/27 and share with the MET/IE WG and MET/S WG the results of Mongolia’s follow-up SIGMET test [ref: para. 6.10.]	Before MET SG/24	Singapore	Ref: MET/IE WG, 5. Work Plan, Activity 3 <u>AND</u> Ref: MET/S WG, 5. Work Plan, Activity 3
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/24	MET/IE WG	Ref: MET/IE WG, 5. Work Plan, Activity 3 <u>AND</u> Ref: MET/S WG, 5. Work Plan, Activity 3
SIGMET Coordination activities				
29	SIGMET Coordination activities – integration and expansion: Consider the proposals presented in WP/19 and the results of the SIGMET coordination project presented in WP/20 when developing the work program on coordinating the next steps to promote integration and expansion of SIGMET coordination activities in the APAC Region [ref: para. 8.8. and 8.11.]	Before MET SG/24	MET/S WG	Ref: MET/S WG, 5. Work Plan, Activity 8
Other				
30	VAAC back-up 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 back-up test procedures [ref: para. 8.25.]	Before MET SG/24	MET/IE WG and MET/S WG	Ref: MET/IE WG, 5. Work Plan, Activity 4
31	Special air-reports – promoting issuance of: Continue to coordinate the required follow-up action (outstanding action item no. 8) concerning promoting the issuance of special air-reports; publicise by way of State letter (and/or other channels) the importance of exchanging special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices) [ref: para. 7.2. and 8.21.]	Before MET SG/24	Secretariat	Not in MET/IE WG or MET/S WG Work Program
32	Air navigation deficiencies – resolution of: Continue to support States, as necessary, such as Nepal, with developing and implementing their corrective action plans for the resolution of air navigation deficiencies [ref: para. 9.4.]	Before MET SG/24	Secretariat	Ref: MET/S WG, 5. Work Plan, Activity 6
33	WAFS and SADIS – preparation for proposed changes: Develop appropriate actions in the work program to facilitate States’ awareness of and planning for the proposed (WP/25) WAFS and SADIS changes in November 2023 [ref: para. 10.5.]	Before MET SG/24	MET/S WG	Not in MET/IE WG or MET/S WG Work Program

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MET/IE WG – TERMS OF REFERENCE AND WORK PROGRAMME

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

TERMS OF REFERENCE

1. COMPOSITION MEMBERSHIP
<p>The MET/IE WG is made up of experts from the following bodies:</p> <ul style="list-style-type: none"> • 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).
Terms of Reference 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;

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	<p>d) Monitor and participate in inter- and intra-regional trials of digital aeronautical meteorological information exchange in support of the implementation of IWXXM and SWIM inter- and intra-regionally;</p> <p>e) Conduct trials and develop standardized quality control, monitoring and management procedures related to exchange of IWXXM and TAC OPMET information;</p> <p>f) Participate in the implementation and promote awareness of the transition to digital exchange of OPMET (IWXXM) and System Wide Information Management (SWIM);</p> <p>g) Conduct regular regional VAAC back-up and SIGMET tests;</p> <p>h) Provide support for the APAC Volcanic Ash Exercises;</p> <p>i) Review and update the regional guidance material related to OPMET exchange, including relevant material on IWXXM, AMHS and SWIM;</p> <p>j) Liaise and consult with other appropriate bodies within ICAO and WMO dealing with communication and/or management aspects of the OPMET exchange; and</p> <p>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.</p>
Work Program	<p>The work to be addressed by the MET/IE WG includes:</p> <ul style="list-style-type: none"> — Examine new and existing requirements for OPMET exchange in APAC and other neighbouring regions along with the WAFS Provider States and assess the feasibility of satisfying these requirements, taking into account the availability of the data; — Keep the ROBEX scheme and other OPMET exchange schemes under review and prepare proposals for updating and optimizing the schemes; — 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; — Review the regional guidance material on OPMET exchange to ensure procedures are provided for the exchange of all required OPMET data; — Conduct trials and develop procedures for quality control, monitoring and management of the OPMET exchange to foster implementation of quality management of OPMET data by the ROCs and the RODBs/ROGs; — Develop quality control guidance material and promote implementation of quality control for OPMET management; — Report on deficiencies in the format and dissemination of OPMET messages; — Participate in the implementation and promote awareness of the transition to digital exchange of OPMET (IWXXM) and System Wide Information Management (SWIM); — Engage with, and participate in the activities of, the SWIM Task Force; — Conduct regular regional VAAC back-up and SIGMET tests; and — Provide support for the APAC Volcanic Ash Exercises.

3. COMMUNICATION STRATEGIES				
Description	Target Audience	Delivery Method	Frequency / Date	Responsibility
Interim Work Plan Program Progress Report	MET/IE WG Members	Web-conference E-mail MET/IE-WG (also reviewed by MET-SG)	Quarterly/as determined by Chair As required Annually	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 Members	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 Members	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
Status & Milestone	ICAO Secretariat and MET/IE WG Members	E-mail WP at MET/IE WG	Annually	Chair
Working Group Progress Report	MET SG Meeting All APAC States	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

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WORK PROGRAM

4. PERFORMANCE FRAMEWORK FORM (PFF)				
Activity/Tasks	Time Frame	Responsibility	Status	Milestone
Task Activity 1: Improve the Availability of OPMET information data	Ongoing	MET/IE WG		1
Task Activity 2: Improve Timeliness, compliance and regularity of OPMET exchange	Ongoing	MET/IE WG		2
Task Activity 3: Identify gaps and errors in processes, procedures and OPMET exchange SIGMET and Advisory Tests	Ongoing	MET/IE WG		3, 4, 5
Activity 4: VAAC Backup Tests	Ongoing	MET/IE WG		
Activity 5: IROG Backup Tests	Ongoing			
Task Activity 6: Review Regional guidance material related to OPMET data exchange	Ongoing	MET/IE WG		3, 4, 5, 6
Task Activity 7: Facilitate and monitor the migration to IWXXM in support of SWIM implementation	2020-2017-20210	MET/IE WG		7
Task Activity 8: Review the OPMET information exchange structure scheme	2020-20192026	MET/IE WG		8
Activity 9: MET information in SWIM	2020-2026			

5. MILESTONES			
Milestone	Accountability	Dates	Status
Milestone 1: Achieve 95% (90%) or greater OPMET availability for AOP (non-AOP) aerodromes where OPMET information is required at RODBs, SADIS and WIFS (i.e., aerodromes listed in former FASID Table MET 2A).	MET/IE WG	Annually Jun	
Milestone 2: Achieve OPMET timeliness, compliance and regularity index of 0.95 (0.90) for AOP (non-AOP) aerodromes where OPMET information is required at RODBs, SADIS and WIFS (i.e., aerodromes listed in former FASID Table MET 2A).	MET/IE WG	Annually Jun	
Milestone 3: SIGMET tests conducted, analysed and report complete.	MET/IE WG	Annually Jun	
Milestone 4: VAAC Back-up tests conducted, analysed and report complete.	VAAC Back-up Focal Points	Annually Jun	
Milestone 5: IROG Back-up tests conducted, analysed and report complete.	IROG Bangkok & Singapore	Annually Mar	
Milestone 6: RODB Monitoring procedures updated in ROBEX Handbook.	Secretariat	Annually Sep	
Milestone 7: Report to MET/IE WG & MET SG on IWXXM exchange & testing.	Secretariat & Chair	Annually Mar & May	
Milestone 8: OPMET Exchange structure review complete.	MET/IE WG	2019	
Milestone 9: Improved efficiency and effectiveness of ROBEX scheme.	RODBs	Annually Jun	
Milestone 10: Participated in the development of SWIM Meteorological services for APAC.	MET/IE WG	2023	

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56. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 1: Increasing OPMET Availability for aerodromes where of OPMET information is required at RODBs, SADIS and WIFS				
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 Assess OPMET monitoring results & identify corrective actions	IATA and RODBs	1.2	Annually Feb Dec	
Activity 1.4: Assess OPMET monitoring results & share results with RODBs	RODB Bangkok	1.3	Annually Jan	
Activity 1.5: Prepare paper reporting results and deficiencies to MET/IE WG meeting.	IATA and RODB Bangkok	1.4	Annually Mar Feb	
Activity 1.6: Report summary of OPMET availability results to MET SG	Secretariat & Chair	1.5	Annually May	
Activity 1.7: Advise States of OPMET deficiencies and corrective actions.	Secretariat	1.6	Annually Jun	
Activity 1.8: Provide Actively engage support to States to rectify with corrective against deficiencies if requested.	RODBs ROCs	1.7	As required	
Milestone 1: Achieve 95% (90%) or greater OPMET availability for AOP (non-AOP) aerodromes at RODBs & WAFS.	MET/IE WG	1.8	Annually Jun	
Activity 2: Improving OPMET Timeliness, compliance and regularity of OPMET exchange at RODBs, SADIS and WIFS				
Activity 2.1: Monitor & collate OPMET data.	RODBs & IATA	-	Annually Dec/Jan	
Activity 2.2: Score RODB OPMET reception against PI thresholds.	RODB Bangkok	-	Annually Dec/Jan	
Activity 2.3: Analyse data and share results with RODBs	RODB Bangkok	2.2	Annually Feb Jan	
Activity 2.4: Prepare paper report results to MET/IE WG meeting & identify corrective actions	RODB Bangkok	2.3	Annually Mar 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	

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56. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
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 & collate data for WC SIGMET Tests	RODBs	3.2	Annually	2 nd Wed in Nov
Activity 3.5: Conduct & collate data for WV SIGMET Tests	RODBs	3.2	Annually	3 rd Wed in Nov
Activity 3.6: Conduct & collate data for WS SIGMET Tests	RODBs	3.2	Annually	4 th Wed in Nov
Activity 3.7: Analyse test data	RODB Singapore & Tokyo	3.4 - 3.6	Annually Jan	
Activity 3.8: Assess SIGMET test results to identify corrective actions from Nov tests	RODB Singapore & Tokyo	3.4 - 3.6	Annually Feb	
Activity 3.9: Report to MET/IE WG	RODB Singapore & 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 Jan	2 months prior to test
Activity 4.2: Update VAAC Back-up Procedures	Secretariat	4.1	Annually May	
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	

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56. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
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 & benefits of back-up arrangements of IROG Tokyo, Nadi & Brisbane	IROG Nadi, Tokyo and Brisbane	-	Nov 2020 ¹⁹	
Activity 5.2: Review IROG Back-up Test procedures to include all IROG.	IROG Bangkok & 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 & Singapore	-	Annually Jan/Feb	
Activity 5.5: Conduct IROG Back-up Test of Bangkok & analyse results	IROG Bangkok & Singapore	5.4	Annually Sept/Oct	
Activity 5.6: Conduct IROG Back-up Test of Singapore & analyse results	IROG Bangkok & Singapore	5.4	Annually Jan/Feb	
Activity 5.8: Report to MET/IE WG	IROG Bangkok & Singapore	5.7	Annually Mar	
Milestone 5: IROG Back-up Tests conducted, analysed and report complete.	IROG Bangkok & Singapore	5.7	Annually Mar	
Activity 6: APAC RODB Monitoring procedures 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 & B in ROBEX Handbook.	Secretariat	6.1	Annually May	
Activity 6.3: Advise Secretariat of changes to ROBEX Handbook.	All States	-	Annually Apr	
Activity 6.4: Incorporation of AMHS & Addressing in ROBEX Handbook.	Pierre & Marco		Sep 2020	
Activity 6.5: Complete update of ROBEX Handbook including Table MET 2A.	New Zealand & Secretariat	-	Annually May	
Activity 6.6: Review ANP Tables (initially MET II-2) and ensure all necessary aerodromes are contained in OPMET bulletins	WG	-	May Annually	
Activity 6.7: Seek MET/SG endorsement of the updated ROBEX Handbook.	Secretariat	-	Annually Jun	
Milestone 6: RODB Monitoring procedures published in ROBEX Handbook	Secretariat	6.7	Annually Sep	
Activity 7: New OPMET Exchange Formats IWXXM Implementation				
Activity 7.1: Monitor migration to IWXXM.	WG	-	As required	
Activity 7.2: Conduct survey to determine status of IWXXM Implementation Undertake IWXXM tests with other centres.	Secretariat WG		As required July 2020, May 2021	

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56. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 7.3: Report to MET SG on APAC States' RODBs support IWXXM implementation status.	Secretariat		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: Conduct IWXXM tests and report to MET/IE WG & RODB Singapore on the status of the testing and implementation of digital OPMET exchange.	WG		Annually Mar	
Activity 7.6: Maintain a register of IWXXM tests conducted, detailing Met software, UAs and MTAs tested	RODB Singapore	7.5	As required	
Activity 7.7: Arrange provision for the next IWXXM Workshop in APAC	Secretariat/Chair, WG, RODB Bangkok	7.2	May Sep 202019	
Activity 7.8: Actively participate in the next APAC IWXXM Workshop	Secretariat/Chair, WG	7.7	June Oct 201920	
Activity 7.9: Prepare information (e.g. issues, CONOPS) for MET/P WG-MIE	WG		As required	
Activity 7.10: Development & Publishing AMHS/FTBP network map	Pierre, Secretariat		Monthly	
Activity 7.11: State IWXXM status register	Secretariat		Monthly	
Milestone 7: Report to MET/IE WG & MET SG on IWXXM exchange & testing.	Secretariat & Chair	7.5, 7.6 & 7.8	Annually May	
Activity 8: Review OPMET 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	
Milestone 8: RODB structure review complete.	MET/IE WG	-	2020	
Activity 9: Improve Efficiency and effectiveness of ROBEX Scheme				
Activity 9.1: Align content of SA bulletins with FT bulletins, where appropriate	All RODBs	-	May 2019	
Activity 9.2: Adjust FT bulletin filing time, where appropriate	All RODBs	-	May 2019	
Activity 9.3: Review ANP Table MET II-2 and ensure all necessary aerodromes are contained in OPMET bulletins	WG	-	May Annually	
Activity 9.4: Review and update ROBEX HB and ICD, including aligning with OPMET bulletin contents and changes associated with IWXXM	WG	-	Feb Annually	
Activity 8.3: Review use of the Request/Reply service	RODBs	-	May 202119	
Activity 8.4: Improve the efficiency of Request/Reply service	RODBs	8.3	Sep 202119	

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56. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Milestone 8: Improved efficiency and effectiveness of ROBEX Scheme	MET/IE WG	-	2021-19	
Activity 9: Participate in the development of meteorological elements of MET information in SWIM in APAC				
Activity 9.1: Assist in the definition of the APAC SWIM Met service catalogue	WG	-	May 2019 As required	
Activity 9.2: Assist in the definition of the APAC SWIM Met data catalogue	WG	-	May 2019 As required	
Milestone 9: Participated in the development of SWIM Meteorological services for APAC	MET/IE WG	-	2023	

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MET/S WG – TERMS OF REFERENCE AND WORK PROGRAMME

ASIA/PACIFIC METEOROLOGICAL SERVICES WORKING GROUP (MET/S WG)

TERMS OF REFERENCE

1. MEMBERSHIP
The MET/S WG comprises experts provided by States, International Organizations and/or bodies and Organizations having experience in the provision of aeronautical meteorological services.

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2. DESCRIPTION	
Objective	Improve the quality of meteorological services, in particular, observations, forecasts, advisories and warnings – including facilitating implementation of the International Airways Volcano Watch (IAVW) and International Tropical Cyclone Watch (ITCW) – in support of the global air navigation plan framework and the aviation system block upgrade (ASBUs) methodology.
Benefits	Improve the safety and efficiency of flight and ground operations.
Terms of Reference Functions of the group	Under guidance from ICAO APAC MET Secretariat: Identify and evaluate current and future requirements with respect to meteorological services, in particular, observations, forecasts, advisories and warnings, in support of the aviation system block upgrades (ASBUs); a) Promote the implementation of meteorological services, in particular, observations, forecasts, advisories and warnings, in support of the aviation system block upgrades (ASBUs), System Wide Information Management (SWIM), MET support to Air Traffic Management, etc.; b) Promote the requirement for, and benefits of, QMS for MET services and competency of aeronautical meteorological personnel; c) Maintain awareness of, and identify new, meteorological deficiencies and formulate strategies to resolve these deficiencies; d) Continually seek ways to improve the quality, compliance against SARPs and operational effectiveness of the meteorological services; Monitor the implementation and use of products and services under the framework of the World Area Forecast System (WAFS), the International Airway Volcano Watch (IAVW) and the International Tropical Cyclone Watch (ITCW); e) Monitor the relevant activities of the MET Panel and appropriate bodies; f) Monitor the relevant activities of VOLCEX/SG; and g) 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.
Work Programme	The work to be addressed by the ASIA/PAC MET/S WG includes: <ul style="list-style-type: none"> Review procedures for the issuance of meteorological observations, forecasts, advisories and warnings in the region and propose actions for their improvement to related performance objectives; In conjunction with MET/IE WG, investigate the deficiencies in the format and dissemination of meteorological observations, forecasts, advisories and warnings and propose remediation plans; Respond to the needs of the guidance and/or training related to the implementation of meteorological observations, forecasts, advisories and warnings and inform MET/IE WG of changes required to the SIGMET guide; In conjunction with MET/R WG and in support of the ASBUs, provide meteorological input for operational planning for specific phenomenon including volcanic ash, radioactive cloud, tropical cyclone, tsunami and space weather; Follow the developments in the States related to the improvement of meteorological observations, forecasts, advisories and warnings and provide regional input on these matters to relevant ICAO and WMO groups and to gather user requirements from ANSPs, IATA, IFATCA and IFALPA; Investigate options for rectification of air navigation deficiencies in the field of meteorological services in APAC States; Provide support for the ICAO APAC volcanic ash exercises;

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2. DESCRIPTION	
	<ul style="list-style-type: none"> Report on its work to the MET Sub-group of APANPIRG; and Maintain a link to the Regional ATM Contingency Plan through the ATM SG.

3. COMMUNICATION STRATEGIES				
Description	Target Audience	Delivery Method	Frequency/ Date	Responsibility
Interim Work Plan Programme Progress Report	MET/S WG Members	Email and web-conference Document via email and posted on ICAO Bangkok website; Webex	Quarterly/as determined by Chair As required but reviewed at least quarterly	Chair and Secretariat
Major Work Programme Progress Report	MET/S WG Members	Working Paper (MET/S WG meeting) Document via email and posted on ICAO Bangkok website; Webex	Annually/published 14-days or more before the meeting As required but reviewed at least quarterly	Chair and Secretariat
General correspondence	MET/S WG Members	Email	As required	MET/S WG Members
Working Group Meeting	MET/S WG Members	Meeting (in conjunction with MET/IE WG)	Yearly in March	Chair
Status & Milestone	ICAO Secretariat and MET/S WG Members	Email WP at MET/S WG	Quarterly	Chair
New, specific proposal for action (WP)	MET/S WG Meeting Members	Working Paper (MET/S WG meeting)	Annually/submitted 28-days or more before the meeting (published 14-days or more before the meeting)	MET/S WG Members or States
New, specific information (IP)	MET/S WG Meeting Members	Information Paper (MET/S WG meeting)	Annually/submitted 28-days or more before the meeting (published 14-days or more before the meeting)	MET/S WG Members or States
Working Group Meeting Report	MET/S WG Members and all APAC States MET/S WG and MET/IE WG	MET/S WG Meeting Report Working Paper	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) Yearly	Chair and Secretariat

WORK PROGRAMME

4. TASKS ACTIVITIES				
Tasks Activity	Time Frame	Responsibility	Status	Milestone
Task Activity 1: Monitor and provide assistance to the regional implementation of meteorological observations, forecasts, warnings and advisories	2020-2021	MET/S WG	In progress	1
Task Activity 2: Track and investigate deficiencies in the format and dissemination of meteorological observations, forecasts, warnings and advisories and propose corrective action and provide information to ICAO and WMO groups for possible assistance	2020-2021	MET/S WG and MET/IE WG	In progress	1,2
Task Activity 3: Review WC, WV & WS SIGMET test results and implement improvements.	2020-2021	MET/S WG	In progress	1
Task Activity 4: Provide guidance and/or training related to the implementation of meteorological observations, forecasts, warnings and advisories, including input to the Regional SIGMET Guide as they relate to the Annex 3 amendment cycle and SIGMET tests.	2020-2021	R/O, MET/S WG and MET/IE WG	In progress	1,3
Task Activity 5: Provide input into regional-operational plans as required for specific phenomenon, including VA, radioactive cloud, TC, Tsunami and Space Weather, with consideration to global ICAO groups and WMO developments.	2020-2021	MET/S WG and MET/R WG	In progress	3

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4. TASKS ACTIVITIES				
Tasks Activity	Time Frame	Responsibility	Status	Milestone
Task Activity 6: Investigate, and implement as appropriate, options to assist States in resolving air navigation deficiencies in the field of meteorological service.	2020-2021	MET/S WG	In progress	4
Task 7: Initiate amendment proposal for ANP concerning regional requirements for 30-hour TAF based on information provided by IATA.	2018	Secretariat, IATA	ON HOLD	5
Task Activity 9 7: Cost recovery – assist the PMC with development of an effective cost recovery strategy for the Pacific SIDS.	2020-2021	MET/S WG	To commence	
Activity 8: SIGMET coordination	2020-2021	MET/S WG	In progress	

5. MILESTONES OF MET/S WG			
Milestone	Accountability	Dates	Status
Milestone 1: Report on SIGMET test results and regional performance to MET SG	Chair	Annually	On track
Milestone 2: Guidance and educational material available	Chair	TBD	
Milestone 3: MET input provided for ASIA/PAC Regional ATM Contingency Plans	ad-hoc group	Next meeting	Recommend that this be closed
Milestone 4: Reduction in air navigation deficiencies in the field of meteorological service.	States	TBD	
(Old) Milestone 5: Conduct survey on the implementation and utilization of WAFS and training needs within the ASIA/PAC Region and report to MET SG	Chair	Every 2 years	Recommend that this be suspended
Milestone 5: Amendment to APAC ANP Vol II (Table MET II-2) to reflect current requirements for provision of 30-hour validity TAF.	States	2017	On hold

5.6. WORK PLAN				
Task Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 3: Review SIGMET test results and implement improvements				
Task Activity 3.1: Review SIGMET tests (conjoint session with MET/IE WG)	Working Group MET/S WG	-	Annually Mar	
Task Activity 3.2: Develop action plan to fix identified deficiencies	Chair in conjunction with the Working Group MET/S WG	conjoint session with MET/IE WG 3.1	During meeting Annually Mar	
Task Activity 3.3: Report back to MET SG on regional performance and action plan	Chair	3.2	Annually May	
Activity 3.4: Advise States of SIGMET deficiencies	Secretariat	3.3	Annually Jun	
Milestone 3: Report on SIGMET test results and regional performance to MET SG Improved issuance and compliance of SIGMETs	Chair MET/S WG	3.4	Annually	
Activity 4: GUIDANCE AND EDUCATIONAL MATERIAL				
Task 2.1: e) Review SIGMET pamphlets with regard to Annex 3 Amendment 77	Australia, Hong Kong, China, Japan and New Zealand (Rapporteur) in conjunction with ICAO HQ and WMO	—	August 2016	Done

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5 6. WORK PLAN				
Task Activity / Milestone	Accountability	Predecessors	Date	Status
Task 2.2: Monitor international development of radioactive cloud SIGMET	China (Rapporteur); Hong Kong China and Japan	—	TBD	Done
Task 2.3: Review the draft guidance of tsunami warning in line with Amendment 77 to Annex 3 and present the guidance to MET SG for endorsement	Australia, Japan (rapporteur) and Indonesia		June 2016	Done
Task 2.4: Review the regional SIGMET Guide to be in line with Amendment 77 to Annex 3 New (specific task): Prepare proposal to include guidance on developing and using objective criteria supporting thunderstorm SIGMET issuance in the SIGMET Guide	Australia (rapporteur), China, Hong Kong China, Japan and New Zealand, in conjunction with Secretariat		2018	Done
Task Activity 4.1: Review the regional SIGMET Guide to be in line with Amendment 78 79 to Annex 3	Australia (rapporteur), Hong Kong China, Japan, New Zealand and Singapore, in conjunction with Secretariat		2020	
Activity 4.2: Review the regional SIGMET Guide to be in line with Amendment 81 to Annex 3	MET/S WG		2023	
Activity 4.3: Develop and implement a plan to educate MET service providers and aviation users on the new ICAO SWX provisions – based on SWXC coordination group (METP)	Secretary		2021	
Activity 4.4: Develop proposal to amend the ROBEX Handbook to facilitate the exchange of routine TAF for locations where States issue routine TAF every three hours instead of the recommended practice of every six hours [Report of MET/S WG/8, paragraph 3.5 refers].	Chair, Secretariat and State/s concerned		As advised by State/s concerned	
Activity 4.5: Develop proposal to amend ANP Volume III to clarify MET-related implementation planning guidance.	Chair, Secretariat		2021	
Milestone 4: Guidance and educational material available	Chair MET/S WG		TBD	
Activity 3: REGIONAL CONTINGENCY PLANS				
Activity 6 – SIGMET Air Navigation Deficiencies				
Task 4.1: Review options to eliminate SIGMET deficiencies	ad hoc group #1: Australia, China, Hong Kong China, Japan, Indonesia, and New Zealand (rapporteur)		Sep 2016	Done
Task 4.2: Monitor the provision of SIGMET services from States with SIGMET deficiencies	ad hoc group #2: Australia, Japan (rapporteur), Singapore and Thailand, in conjunction with MET/S WG chair and Secretariat	4.1	May 2016 and 2017	Done (July 2016) 2017 (to be coordinated with RODBs)
Task Activity 6.1: Assist the ICAO Secretariat in the facilitation of discussion of viable options with relevant States.	Paula and Secretariat ad hoc group #1	4.1	Ongoing	
Task Activity 6.2: Monitor the implementation of the solution/s to remove deficiencies.	MET/S WG ad hoc group #1	4.2	Ongoing	
Task Activity 6.3: Monitor global development on the establishment of a regional advisory system for hazardous weather information system.	MET/S WG ad hoc group #1		Ongoing	
Task Activity 6.4: Report progress to MET SG	Secretariat Rapporteur	4.3	Ongoing	

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5 6. WORK PLAN				
Task Activity / Milestone	Accountability	Predecessors	Date	Status
	of ad hoc group #1			
Task 4.7: New task: Investigate options and provide examples for monitoring SIGMET implementation utilizing SIGMET coordination platforms Investigate metrics for monitoring SIGMET implementation, in coordination with RODBs, referring to practices in SIGMET coordination activities	ad hoc group #1 Singapore		Ongoing	
Milestone 6: Reduction in SIGMET air navigation deficiencies.	MET/S WG States		2021	
Activity 5 – Proposal to amend APAC ANP Volume II, Table MET II-2				
Task 5.1: Provide a list of regional requirements for 30-hour TAF	IATA	MET/S WG/7	Apr 2017	Done
Task 5.2: Draft a proposal to amend the ANP concerning regional requirements for 30-hour TAF based on information provided by IATA	Secretariat, IATA	5.1	Apr 2017	Done
Task 5.3: Ascertain whether the proposal has adequate support from the State/s affected	Secretariat	5.2	Apr 2017	Done
Task 5.4: Present outcomes of 5.1 to 5.3 for review by MET SG/21	Secretariat, IATA	5.3	May 2017	Done
Task 5.5: If supported, circulate the proposal to amend the ANP concerning regional requirements for 30-hour TAF	Secretariat	5.4	After May 2017	Done
Task: Develop proposal to amend the ROBEX Handbook to facilitate the exchange of routine TAF for locations where States issue routine TAF every three hours instead of the recommended practice of every six hours [Report of MET/S WG/8, paragraph 3.5 refers].	Chair, Secretariat and State/s concerned		As advised by State/s concerned	
Task: Develop proposal to amend ANP Volume III to clarify MET-related implementation planning guidance.	Chair, Secretariat		2021	
Activity 7 – Cost recovery strategy				
Task Activity 7: Cost recovery – assist the PMC with development of an effective cost recovery strategy for the Pacific SIDS.	Tonga, Secretariat		2021	
Deliverable Activity 8 – SIGMET coordination activities in APAC Region Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.				
Activity 8.1 Consolidated progress report on SIGMET coordination activities in the APAC Region and recommendations based on lessons learnt: - new and existing SIGMET coordination activities - WP (MET/R WG) and SP (MET/ATM Seminar) MET/IE WG and MET/S WG - key lessons learnt/recommendations for regional guidance on SIGMET coordination - identify opportunities for integration and expansion of SIGMET coordination activities	Ad-hoc group: Japan, Singapore, Hong Kong China, (Joint Rapporteurs) China, Indonesia, Malaysia, India, Viet Nam, Thailand, Fiji and IFALPA, coordinated by the Chairperson and Secretary	Next meeting of MET/R WG and MET/ATM Seminar	MET/S WG	

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LIST OF PARTICIPANTS

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LIST OF WORKIKNG AND INFORMATION PAPERS

WP/IP No.	Agenda Item	Subject	Presented by
WORKING PAPERS			
WP/01	-	Provisional Agenda	Secretariat
WP/02	2	Follow-up Action from MET/IE WG/17	Secretariat
WP/03	3	ASIA/PAC Performance Indices	Thailand
WP/04	3	ASIA/PAC Inter-Regional OPMET Gateway Backup Exercise between RODB Bangkok and RODB Singapore	Thailand
WP/05	3	Global Repository for IWXXM State Extensions	METP WG-MIE
WP/06	3	Current Status and Plan of IWXXM Implementation in Indonesia	Indonesia
WP/07	3	Webinar on the Implementation of IWXXM and AMHS	Secretariat
WP/08	4	ROBEX Handbook Updates	Secretariat
WP/09	4	Update to the ROBEX Handbook	Thailand
WP/10	4	Revised and Harmonized OPMET Notification Procedure	Chair of MET/IE Working Group
WP/11	4	Location of FASID Tables	Australia
WP/12	4	Updates to Australia's MWOs	Australia
WP/13	5	Review MET/IE WG Terms of Reference and Work Program	Secretariat
WP/14	6	Results of SIGMET Tests 2019 – WC and WV	Japan
WP/15	6	Updates to ROBEX Handbook	Australia
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WP/17	2	Follow-up Action from MET/S WG/9	Secretariat

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WP/IP No.	Agenda Item	Subject	Presented by
WP/18	8	Activities of the Pacific Island Aviation Weather Services panel	Pacific Islands Aviation Weather Services Panel Task Team
WP/19	8	Indonesia's Proposals to Expand SIGMET Coordination Activities between Neighbouring MWOs	Secretariat and Indonesia
WP/20	8	South and South-Eastern Asia SIGMET Coordination Project	Hong Kong, China, Indonesia and Sri Lanka
WP/21	8	A Collaborative WC SIGMET Coordination Table-Top Exercise	China, Hong Kong, China, Philippines and Vietnam
WP/22	8	Recent Progress of International Cooperation Scheme on Collaborative SIGMET Issuance (CSI)	Japan, Lao PDR, Myanmar, Philippines, Thailand and Vietnam
WP/23	9	Review APANPIRG Air Navigation Deficiencies	Secretariat
WP/24	10	Update to Regional SIGMET Guide	MET/S WG Ad Hoc Group
WP/25	11	SADIS and WAFS Update	ICAO Secretariat on behalf of the SADIS Provider
WP/26	11	Review MET/S WG Terms of Reference and Work Program	Secretariat
WP/27	6	Review of WS SIGMET Test 15	Singapore
WP/28	3	ASIA/PAC Inter-regional OPMET Gateway backup Exercise between IROG Singapore and IROG Bangkok	Singapore
INFORMATION PAPERS			
IP/01	-	Meeting Bulletin	Secretariat
IP/02	3	Status and Plans for Implementation of IWXXM in Thailand	Thailand

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IP/03	3	Status and Plans for IWXXM in Australia	Australia
IP/04	3	Status of IWXXM in New Zealand	New Zealand
IP/05	3	Plans for IWXXM in Japan	Japan
IP/06	3	Enhancement of HKO SIGMET Coordination Platform with IWXXM Encoding	Hong Kong, China
IP/07	8	Update of the GHSV SIGMET Coordination Project around Western and Northern Part of South China Sea	Cambodia, China, Hong Kong, China and Vietnam
IP/08	8	Wellington and Darwin VAAC Back-up	New Zealand
IP/09	8	Introduction to the Newly Established Aerodrome Meteorological Stations at Sisingamaraja XII Airport and Yogyakarta International Airport in Indonesia	Indonesia
IP/10	8	Development of a Nowcasting System for Terminal Airspace	Singapore
IP/11	9	Uplifting Observations and Meteorological Forecasting Capacity in Papua New Guinea: The Papua New Guinea Capacity Development Program (PNGCDP: 2017-2022)	Australia
IP/12	10	Three-Hourly Update of Aerodrome Forecasts (TAF3)	Australia
IP/13	10	VAAC Darwin Management Report	Australia
IP/14	10	VAAC Tokyo Management Report	Japan
IP/15	3	Implementation of Vietnam NOC (National OPMET Centre)	Viet Nam and Thailand
IP/16	3	Status and Plans for IWXXM in Hong Kong, China	Hong Kong, China
IP/17	3	Status and Plans for IWXXM in Singapore	Singapore
IP/18	8	The Progress of MET-ATM Coordination in CDM	China

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IP/19	3	Status and Plans for IWXXM in Fiji	Fiji
IP/20	3	Current Status and Plans of Meteorological Information Exchange of Mongolia	Mongolia
