

International Civil Aviation Organization



ICAO

WORKING PAPER (WP/04)

ICAO Asia and Pacific (APAC)

Twenty-Eighth Meeting of the Meteorology Sub-Group
(MET SG/28)

Bangkok, Thailand, 8 to 12 July 2024

Agenda Item 2: Review outcomes from previous meetings

REVIEW OF OUTCOMES FROM MET/R WG/13

(Presented by the Chair of MET/R WG)

SUMMARY

This paper presents a summary of the Meteorology/Air Traffic Management (MET/ATM) Seminar and the Thirteenth Meeting of the Meteorological Requirements Working Group (MET/R WG/13), held from 22 to 26 April 2024 in Bangkok, Thailand. The paper includes agreed actions and the updated work plan.

1. INTRODUCTION

1.1 The ICAO Asia and Pacific (APAC) Office hosted the Thirteenth Meeting of the Meteorological Requirements Working Group (MET/R WG/13) from 22-26 April 2024 including a joint plenary session with the Fourteenth Meeting of the APAC Air Traffic Flow Management Steering Group (ATFM/SG/14), in conjunction with ICAO APAC Seminar on Meteorology and Air Traffic Management (MET/ATM Seminar) on 22 April 2024.

1.2 The MET/R WG/13 meeting was attended by Seventy-three (73) participants from twenty-one (21) States and Special Administrative Regions and one International Organisation. The meeting was chaired by Mr Ashwin Naidu, Aviation Customer Lead of Australian Bureau of Meteorology, and Mr Peter Dunda, Regional Officer, Aeronautical Meteorology and Environment (MET/ENV), assisted as the Secretariat.

1.3 The MET/ATM Seminar were attended by 166 in-person participants and 38 online participants from 25 Administrations and four International Organizations. Mr Ashwin Naidu, Mr Piyawut Tantimekabut, Air Traffic Management Network Manager, AEROTHAI, Ms. Christy Leung, Scientific Officer, Hong Kong Observatory (HKO), and Mr. Manjunath Krishna Nelli, Regional Officer, Air Traffic Management (ATM), ICAO APAC Office, moderated the MET/ATM Seminar.

1.4 Furthermore, Mr Ashwin Naidu and Mr Piyawut Tantimekabut jointly presided as chairpersons of the joint plenary session of MET/R WG/13 and ATFM/SG/14.

1.5 A copy of the full seminar and meeting report, and all related meeting documentation is available at <https://www.icao.int/APAC/Meetings/Pages/2024-MET-R-WG13.aspx>

2. DISCUSSION

Organisation Matters

2.1 The Meeting adopted the agenda as listed below:

- Agenda Item 1: Organisational matters
- Agenda Item 2: Review outcomes of related meetings
- Agenda Item 3: Collaboration between MET and ATM stakeholders
- Agenda Item 4: Future work program and terms of reference
- Agenda Item 5: Any other business
- Agenda Item 6: Next Meeting

2.2 Considering that following the MET SG/27 Decision MET SG 27-07: *Dissolution of MET/S WG* (to be discussed in WP/03), the expert ad hoc group on SIGMET coordination now reports to the MET/R WG, the meeting suggested updating the agenda for the next meeting to include a specific item on SIGMET coordination.

2.3 Furthermore, the *Future work program and terms of reference*, incorporated the activities of the ad hoc group on SIGMET coordination into a new deliverable on SIGMET coordination in the MET/R WG work plan.

Review of MET/ATM Seminar

2.4 The MET/ ATM Seminar provided an opportunity for States and Organisations to share information, experiences and ideas on planning and implementing meteorological services to support ATM and ATFM operations, focusing on collaborative arrangements and integrating MET information into ATM.

2.5 The Seminar focused on three major topics and included several presentations under each topic (as below):

Topic 1 - ICAO provisions - framework of ICAO provisions supporting the integration of MET information into ATM

SP/01 – Updates to ICAO provisions (Secretariat)

SP/02 – Terrain and Obstacle Clearance and Cold Temperature Correction (IFATCA)

Topic 2 - National initiatives - benefits and challenges of collaboration between MET and ATM communities and integrating MET information within States' ATM systems

SP/03 – CAAC MET Service to support ATM Operations (China)

SP/04 – Coordination challenges between MET and ATM in Pacific Island (Kiribati)

SP/05 – Collaborative Network Management (Australia)

SP/06 – MET challenges in support of ATC Decision-Making (Australia)

SP/07 – Case Study: MET information and services to support ATM - adverse weather over the aerodromes (Japan)

SP/08 – Verification and enhancement of Impact-Based MET information to support ATM Operations (Japan)

SP/09 – Development of Probabilistic Forecast Products supporting ATM (Hong Kong, China)

Topic 3 - International initiatives - collaboration between MET and ATM communities internationally and benefits and challenges of collaboration between MET and ATM communities and integrating MET information within bilateral and multilateral ATM systems.

SP/10 – Regional Operation Support: CADENA (United States)

SP/11 – Space Weather Services (Australia)

Copies of all the Seminar presentations, including a summary of the Seminar discussions, are available at the ICAO APAC Office website (<https://www.icao.int/APAC/Meetings/Pages/2024-MET-R-WG13.aspx>)

Review of follow-up from previous meetings

2.6 The meeting reviewed the status of actions from the previous MET/R WG/12. These included:

- a) Updates to the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations;
- b) Progress on the follow-up action on the APAC Use Cases and User Requirements for SWIM-Based MET Information Services Supporting ATFM;
- c) Noted that the unresolved Action Items from MET/R WG/11-01, on updating the work plan deliverables No. 2 and 5 on regional guidance related to the APAC Seamless ANS Plan and the APAC ANP Volume III could be closed following further discussion and agreement under Agenda Item 4: Future work program and terms of reference;
- d) Suggested to the unresolved Action Item MET/R WG/09-01, on publicising the importance of exchanging special air reports to support MET service for ATM be incorporated in the deliverables of MET/R WG work plan, including consideration to include in the next MET/ATM seminar, to be conducted in conjunction with MET/R WG/14 and ATFM/SG/15 in 2025, an appropriate presentation on special air-reports.
- e) The updated status of follow-up action on the MET/R WG List of Actions is indicated in Appendix A of MET/R WG/13 Report (and **Appendix A** of this paper).

Review of other related meetings

2.7 The meeting noted that following the MET SG/27 Decision MET SG 27-07: *Dissolution of MET/S WG*, the expert ad hoc group on SIGMET coordination reports to the MET/R WG, and the expert ad hoc group on Regional SIGMET Guide updates reports to the MET SG.

2.8 Considering the different reporting paths for the two ad hoc groups related to SIGMET, the meeting considered while the MET/R WG will largely focus on any SIGMET coordination and harmonisation between States, there is a necessity to update the work plan to ensure the ad hoc groups coordinate the development of regional guidance on SIGMET coordination for inclusion in the Regional SIGMET Guide. As a result, the WG took several actions to progress SIGMET Guide and Coordination activities.

2.9 Concerning MET SG/27 action items 27/02 and 27/07 on updates to the Regional SIGMET Guide, the meeting was informed that the proposed updated guidance on SIGMET for volcanic ash crossing FIR boundaries and updated VAAC backup procedures were ready for publication by the Secretariat.

2.10 Concerning MET SG/27 Action Item 27/05 on the Document of cases of SIGMET coordination, the meeting noted that WP/09 – *SIGMET coordination common practices and guidelines*

would propose updates to the relevant regional guidance material. Therefore, the status of Action Item 27/05 could be considered as in progress.

2.11 In addition, concerning MET SG/27 Action Item 27/13 on updating the online repository of APAC SIGMET coordination activities based on MET SG/27, IP/07 – *Progress in SIGMET coordination work between China and adjacent countries*, the meeting noted that the activities are included in the online repository and the status of Action Item 27/13 could be considered as completed.

2.12 Based on the discussion above, the proposed updates to the follow-up status on the MET SG List of Actions are indicated in Appendix A of MET/R WG/13 Report (and **Appendix A** of this paper).

2.13 The meeting reviewed relevant outcomes from the Thirty-fourth Meeting of the Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/34).

2.14 On the matter of air navigation deficiencies, the meeting noted that APANPIRG/34 considered the regular dissemination of the required SIGMET information in the IWXXM form (in addition to the TAC form) as a condition for removing the deficiency AP-MET-14 (on requirements for issuance and dissemination of SIGMET information for Kathmandu FIR). Furthermore, APANPIRG/34 recommended that the MET SG consider identifying deficiencies in implementing IWXXM for possible inclusion in the APANPIRG list of air navigation deficiencies.

Collaboration between MET and ATM Stakeholders

2.15 The Meeting reviewed the **SIGMET Coordination activities**:

- a) The outcomes from the Workshop of the Collaborative SIGMET Issuance (CSI) project on 12 to 14 March 2024, which included issues concerning SIGMET issuance for convective systems over multiple FIRs, TC SIGMET handover procedure, improving the availability of special air reports to support SIGMET service, interoperability of web platforms supporting SIGMET coordination, and the WMO header used when correcting a SIGMET. Additionally, the Meeting took a few Action Items regarding the outdated SIGMET leaflets in on the ICAO website, and suggesting SIGMET Guide ad hoc Group to make improvements to the guidance on using the WMO header when correcting a SIGMET.
- b) The identified practices for coordinating SIGMET on tropical cyclones and thunderstorms in the APAC Region and proposed updates to incorporate the information in related guidance materials. The meeting noted differences in the States' implementation of SARPs related to the coordination of SIGMET information for tropical cyclones. The meeting requested that the ad hoc group on the SIGMET Guide consider including the information concerning the criteria for issuance of WS SIGMET, in future update to the SIGMET Guide, to enhance the information in the APAC Regional SIGMET Guide concerning coordinating SIGMET for thunderstorms.
- c) The latest Oceanic SIGMET Coordination group developments involving Fiji, Hong Kong China, Papua New Guinea and Solomon Islands, covering four FIRs. A SIGMET coordination trial between Indonesia and Papua New Guinea commenced in Jan 2024, with Indonesia joining the group as a trial member. This project supported the corrective action for rectifying APANPIRG air navigation deficiencies and contributed to the capacity-building efforts on SIGMET issuance. Furthermore, the meeting also requested to update the latest developments of the Oceanic SIGMET Coordination group in the Online repository for APAC SIGMET Coordination activities.

- d) Practices employed by Indonesian MWO for issuing SIGMET for volcanic ash from a volcano close to the boundary between FIRs. For the issue reported by Indonesia concerning the issuance of SIGMET for volcanic ash when a Volcanic Ash Advisory (VAA) has not been issued, the meeting noted that SIGMET for volcanic ash should be based on the VAA from the associated VAAC. Therefore, the meeting advised Indonesia to coordinate the establishment and implementation of procedures with the VAAC to ensure the timely issuance of VAA and SIGMET according to the ICAO provisions. Following this, VAAC Darwin presented an update to Indonesia with the changes to practices made by VAAC Darwin on 21 March, specifically on this issue. The examples were presented to the SIGMET Coordination adhoc Group as well to consider this in the SIGMET Guide.

2.16 Indonesia shared information on activities to engage aviation stakeholders and promote best practices in Collaborative Decision-Making (CDM) concerning volcanic ash information and flight safety.

2.17 Developments in China in detecting and warning of low-level wind shear and turbulence to support ATM operations in China. The construction of an integrated ground-based detection network, development of comprehensive alarm systems, and implementation of comprehensive weather information service processes have helped to improve the accuracy, timeliness and refinement of aviation weather products and services, enhance the support to ATM operations, ensure flight safety and increase operation efficiency.

2.18 The new implementation of tailored MET information and services to support ATM operations, which was prepared for inclusion in the APAC regional guidance. The meeting requested the ad hoc group on the Regional Guidance for Tailored MET to support ATM Operations to consider the information provided by China as an example for inclusion in Appendix 1 of the guidance and seek approval for updating the guidance from the MET SG. Based on the discussion, the Meeting agreed to ACTION 11 and formulated a Decision for the ad hoc group to update the regional guidance.

Decision MET/R WG/13-02: *Updating the Regional Guidance for Tailored MET to support ATM Operations.* The ad hoc group on the Regional Guidance for Tailored MET to support ATM Operations is requested to include China's example in Appendix 1 of the updated guidance.

2.19 India discussed an issue concerning verifying wind forecast in TAF compared to the guidance on the operationally desirable accuracy of forecasts as given in ICAO Annex 3, Attachment B. The meeting recommended that India consider establishing additional criteria for TAF, based on the ICAO Annex 3, to meet users' needs in consultation with the appropriate ATS authority and the operators concerned.

2.20 India presented information on the wind index (WI) and Dry microburst index (DMI) applied to thunderstorm forecasts to support aviation operations.

2.21 The Chair (on behalf of Kiribati) presented information on the collaboration between the Kiribati Meteorological Service and the Kiribati Air Traffic Services, including the challenges and activities faced by Kiribati. Regarding this, the meeting was informed of an arrangement for providing meteorological service for aerodromes in Kiribati by Fiji on Kiribati's behalf. The meeting requested the Secretariat to facilitate the necessary liaison between the meteorological authorities in Kiribati and Fiji to support the ongoing effectiveness of the arrangement and the rectification of air navigation deficiencies related to MET in Kiribati.

2.22 The Republic of Korea presented information on their comprehensive interviews and surveys with the users and the inclusion of this information to enhance the utilization and integration of aviation weather information to support air traffic controllers.

Joint plenary session of MET/R WG/13 and ATFM/SG/14

Survey of State Meteorological Information Supporting ATM

2.23 The meeting reviewed progress on the designated ad hoc group’s report of the 2021 survey of current and future MET information services provided by States to support ATM and ATFM.

2.24 Based on the ad hoc group recommendation, the meeting agreed that subject to final editorial and formatting improvements by the Secretariat, the survey report can be published on the ICAO APAC website and made available for States and stakeholders.

2.25 Considering the report was produced based on information collected in 2021, the meeting requested the ad hoc group to develop a proposal on the appropriate timing and content for conducting a future follow-up survey. The Chair of the ATFM/SG invited the ATFM/SG members to nominate experts (within the next two weeks) to join the members of the MET/R WG ad hoc group on analysis of MET information requirements.

2.26 Based on the above discussion, the Meeting agreed to Actions 12 and 13 and formulated Decisions as follows:

Decision MET/R WG/13-03: *Publishing the Survey of State MET Information Supporting ATM.* The secretariat is requested to publish the Survey of State MET Information Supporting ATM report on the ICAO APAC website.

Decision MET/R WG/13-04: *Follow-up Survey of State MET Information Supporting ATM.* The ad hoc group on the Survey of State MET Information Supporting ATM is requested to propose the appropriate time and content of a future follow-up survey.

APAC Use Cases and User Requirements for SWIM-Based MET Information Services Supporting ATFM

2.27 Following reviews of the draft reference document by MET SG/27 and ATM/SG/11 in September and October 2023, the ad hoc group proposed an additional “USE CASE 5: Use of Quantitative Volcanic Ash Concentration Information in Trajectory-based Operation” to be included in the document, along with editorial changes.

2.28 Furthermore, the ad hoc group recommended the document be published on the ICAO APAC website, as a living reference, to ensure the document can be regularly reviewed, including expanding and/or improving the collection of use cases based on known or expected events. The reference document is expected to assist in developing appropriate MET information services and the associated SWIM-enabled MET applications to meet the operational needs of ATFM in the APAC Region.

2.29 The meeting requested the ad hoc group to present a paper to the upcoming MET/SG and ATM/SG meetings with proposals to publish the draft reference document on the ICAO website and include a procedure for updating the document with new cases and making it a living document.

2.30 Based on the discussion, the Meeting agreed to Action 14 and formulated a Decision, as follows

Decision MET/R WG/13-05: *Publishing the APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM.* The ad hoc group on APAC Use Cases and User

Requirements for SWIM-based MET Information Services Supporting ATFM is requested to propose procedures for publishing and updating the document on the ICAO website.

APAC Seamless ANS Plan Update

2.31 ICAO presented the progress of the Asia/Pacific Seamless ANS Plan update for review by ATM/SG/12. The secretariat presented the guiding principles adopted and the process agreed by APANPIRG/33 for updating the Plan. The draft version of the Plan required further consultation with APAC States/ Administrations and APANPIRG Sub-Groups before being endorsed by APANPIRG.

2.32 ICAO expressed a priority to be applied by the Regions to fully develop ANP Vol III, the update of the Seamless ANS Plan and its migration into ANP Vol. III would be conducted simultaneously.

2.33 Noting the major changes for Seamless ANS Plan V4.0 and adding items to V3.0, the ICAO APAC Seamless ANS Reporting Portal was prepared. A workshop with demonstrations and interactive sessions were held to facilitate States using the Portal in April 2024.

2.34 In addition to the above, the meeting reviewed progress on the designated adhoc group's identification of the MET requirements to support the elements of the APAC Seamless ANS Plan, including the adhoc group's mapping document which maps APAC Seamless ANS Plan Priority 1 Elements to the GANP's ASBU AMET elements.

2.35 The meeting considered the above mapping document's value as a companion to the Seamless ANS Plan as an appendix and requested the Secretariat to publish the document accordingly. The meeting also noted that, under the MET/R WG work plan, the adhoc group would continue to review and propose future updates to the mapping document based on future updates of the Seamless ANS Plan and to map the APAC Seamless ANS Plan Priority 2 and 3 Elements to the GANP's ASBU AMET elements.

2.36 Based on the above discussion, the Meeting agreed to Actions 15 and 16 and formulated Decisions as follows:

Decision MET/R WG/13-06: *Mapping APAC Seamless ANS Plan to ASBU AMET elements.* The secretariat is requested to publish the document mapping APAC Seamless ANS Plan Priority 1 Elements to the GANP's ASBU AMET elements as a companion (appendix) to the Seamless ANS Plan.

Decision MET/R WG/13-07: *Updates to the mapping of APAC Seamless ANS Plan to ASBU AMET elements.* The ad hoc group on MET Information needed to Support the Elements of the APAC Seamless ANS Plan is requested to propose future updates to the document mapping APAC Seamless ANS Plan Priority 1 Elements to the GANP's ASBU AMET elements and include the mapping of APAC Seamless ANS Plan Priority 2 Elements.

Other MET – ATM Coordination related items

2.37 The Meeting reviewed other Information Papers (IPs) and Working Papers (WPs) were presented on activities undertaken by the States to enhance close coordination between MET and ATM community in the APAC region, including:

2.38 ICAO's information about the ICAO APAC/MID contingency Planning Workshop to be held from 25-27 June 2024 in Bangkok, Thailand, followed by the ICAO APAC ATM Contingency Table Top exercise on 28 June 2024. There is a plan to capture some of the MET information, such as

Space Weather and Volcanic ASH, during the planning workshop. Ashwin Naidu was requested to do a presentation on Space Weather at this workshop.

2.39 CANSO's information paper of the Plenary session, "Planning for the Expected and Unexpected: a Special Event and Disruption Planning Reference for ANSPs", which included 10 case studies.

2.40 Australia's presentation (by Simon Godsmark (Airservices)), on Meteorological Collaborative Decision Making (MET CDM), used in Australia, to formulate aircraft arrival rates for Air Traffic Flow Management (ATFM) and technology developments to enhance network management decisions.

2.41 A joint paper by Japan and Singapore, concerning practices and challenges associated with providing and using MET information and services to support ATM operations.

2.42 Hong Kong's paper on development of a new product named Automatic Integrated Real-time Convection foreCAST (AIRCAST), tailor-made for the air traffic controllers of the Hong Kong Civil Aviation Department to provide extended significant convection forecast up to 8 hours to support their tactical decision-making.

2.43 Hong Kong presented another paper on the factors that have been considered when selecting weather elements, specifically winds and RVR readings, to be reported in METAR/SPECI at the Hong Kong International Airport (HKIA) under Three-runway System (3RS) to meet "representativeness" requirements outlined in ICAO Annex 3.

2.44 Indonesia's implementation of the INA-SIAM system in supporting aviation meteorological services. The meeting suggested Indonesia to consider producing a paper at a future ICAO APAC meeting to include its example in the Regional Guidance for Tailored MET to support ATM Operations.

2.45 Japan presented information on JMA's practices and challenges in verifying impact-based ATM-tailored meteorological information and its recent enhancement on translating meteorological conditions into impact levels for ATM in coordination with ATFM units.

Future work program and Review of terms of reference

2.46 The Meeting conducted a session with the core members of the MET/R WG to make several updates to the Work Plan, which was last reviewed and endorsed by the MET SG/27. The draft version was presented to the entire MET/R WG meeting for further endorsement.

2.47 As part of the review process, the following were changed (or suggested to take place):

- a) A review of the terminology used to describe the MET service users to ensure the MET/R WG terms of reference sufficiently address the need to support all users of MET service, which includes operators, flight crew members, air traffic services units, search and rescue services units, airport managements and others concerned with the conduct or development of international air navigation (i.e., as stipulated in ICAO Annex 3, para. 2.1.2) and might not be identified in the definition for ATM, which includes air traffic services, airspace management and air traffic flow management;
- b) Updates to the number of activities and deliverables;
- c) Formulation of a new deliverable on SIGMET coordination and activities;

- d) Updates to the membership list, based on latest members from each State;
- e) Updates from meeting participants with their intention to contribute to the MET/R WG deliverables;
- f) The Chair, reiterated the critical need for the MET/R WG to regularly report progress on the work plan, as indicated in the terms of reference communication strategies.

2.48 Detailed proposed updates to the MET/R WG terms of reference and work plan document, for further review and endorsement by MET SG, are highlighted in **Appendix B** of this paper.

Any other business

2.49 The Chair noted the absence of members from IATA and IFALPA in the MET/R WG meeting. Considering the MET/R WG's focus on the collaboration and relationship with MET service users, development of MET service user requirements, and promotion of MET service user education, the meeting requested the Secretariat to continue to facilitate and encourage participation in the MET/R WG by representatives from IATA and IFALPA.

2.50 The Chair also noted that some IPs included proposals for action and, therefore, reminded the meeting to ensure that, in the future, proposals for action should be presented in WPs.

Next Meeting

2.51 The Secretariat and Chair informed the meeting that the next meeting of the MET/R WG, in conjunction with the ATFM/SG and a MET/ATM Seminar, would be held tentatively in April/May 2025.

2.52 The meeting was reminded that Hong Kong, China, was considering hosting the next meeting of the MET/R WG in conjunction with the ATFM/SG in 2025. Subsequently, Hong Kong advised that it would not be able to host these meetings in 2025 but expressed interest in hosting in 2026.

2.53 Following the discussions related to the meeting agenda and SIGMET coordination and considering positive feedback from meeting participants on the MET/ATM seminar and the MET/R WG and ATFM/SG joint plenary session, the meeting requested the Chair and Secretariat to consider a plan for the next meeting, including the MET/ATM seminar and MET/R WG and ATFM/SG joint plenary session. This includes making a detailed list of presentations available to the participants before the Seminar. The meeting agenda should include specific items for the joint plenary session and the major work plan deliverables, such as SIGMET coordination.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

- a) Note the information contained in this paper; and
 - b) propose further updates to the Terms of Reference, Future Work Programme and/or List of Actions.
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MET/R WG – LIST OF ACTIONS(Note: Proposed updates are indicated with ~~strikethrough~~ and **highlighted** text)**New action items recorded by MET/R WG/13**

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
MET/R WG/13 01	Update the agenda for the next meeting to include a specific item on SIGMET coordination. [Ref: MET/R WG/13 Report, 1.2.]	MET/R WG/14	Chair and Secretariat	To begin
MET/R WG/13 02	Incorporate the unresolved Action Item MET/R WG/09-01 into the MET/R WG work plan deliverables and include an appropriate presentation in the next MET/ATM seminar on special air reports. [Ref: MET/R WG/13 Report, 2.4.]	MET/R WG/14	Chair and Secretariat	To begin
MET/R WG/13 03	Publish the Regional SIGMET Guide updated guidance on SIGMET for volcanic ash crossing FIR boundaries and VAAC backup procedures. [Ref: MET/R WG/13 Report, 2.9.]	ASAP	Secretariat	To begin
MET/R WG/13 04	Remove the outdated SIGMET leaflets (WC/WS/WV) containing CCx usage instructions from the ICAO website. [Ref: MET/R WG/13 Report, 3.2.]	ASAP	Secretariat	To begin
MET/R WG/13 05	Consider improvements to the SIGMET Guide on using the WMO header when correcting a SIGMET. [Ref: MET/R WG/13 Report, 3.3.]	MET/R WG/14	Ad hoc group on the SIGMET Guide	To begin
MET/R WG/13 06	Invite States concerned to provide details of their relevant practices on WC SIGMET handover procedure to assist the ad hoc group in collating information to support States on coordinating SIGMET information for tropical cyclones. [Ref: MET/R WG/13 Report, 3.5.]	ASAP	Secretariat	To begin
MET/R WG/13 07	Consider including the information in Appendix B and C of WP/09 concerning the criteria for issuance of WS SIGMET in a future update to the SIGMET Guide to enhance the information concerning coordinating SIGMET for thunderstorms. [Ref: MET/R WG/13 Report, 3.6.]	MET/R WG/14	Ad hoc group on the SIGMET Guide	To begin
MET/R WG/13 08	Consider the suitability of the text used (such as the words 'shall' and 'should') in the procedures used to coordinate SIGMET in WP/8, Appendix A, for possible inclusion in the regional guidance and to coordinate with the ad hoc group on the SIGMET Guide. [Ref: MET/R WG/13 Report, 3.9.]	MET/R WG/14	Ad hoc group on SIGMET coordination	To begin
MET/R WG/13 09	Update the latest developments of the Oceanic SIGMET Coordination group in the Online repository for APAC SIGMET Coordination activities. [Ref: MET/R WG/13 Report, 3.10.]	ASAP	Ad hoc group on SIGMET coordination	To begin
MET/R WG/13 10	Consider Indonesia's criteria for assigning MWO responsibility for SIGMET when volcanic ash impacts adjacent FIRs for possible inclusion in the regional guidance material. [Ref: MET/R WG/13 Report, 3.13.]	MET/R WG/14	Ad hoc group on SIGMET coordination in cooperation with the ad hoc group on the Regional SIGMET Guide	To begin
MET/R WG/13 11	Consider the information provided by China in IP/02 as an example for inclusion in Appendix 1 of the Regional Guidance for Tailored MET to support ATM Operations and seek approval from the MET SG to update the guidance. [Ref: MET/R WG/13 Report, 3.17.]	MET SG/28	Ad hoc group on the Regional Guidance for Tailored MET to support ATM Operations	To begin
MET/R WG/13 12	Finalize the editorial and formatting improvements to the Survey of MET information supporting ATM report in WP/05 and make it available to States and stakeholders on the ICAO APAC website. [Ref: MET/R WG/13 Report, 3.27.]	ASAP	Secretariat	To begin
MET/R	Develop a proposal on the appropriate timing and content	MET/R WG/14	Ad hoc group on the	To begin

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
WG/13 13	for conducting a future follow-up Survey of MET information supporting ATM. [Ref: MET/R WG/13 Report, 3.28.]		Survey of MET information supporting ATM	
MET/R WG/13 14	Present a paper to the upcoming MET/SG and ATM/SG meetings with proposals to publish the draft reference document (<i>APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM</i>) on the ICAO website and include a procedure for updating the document with new cases and making it a living document. [Ref: MET/R WG/13 Report, 3.32.]	MET SG/28 and ATM/SG/12	Ad hoc group on APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM	To begin
MET/R WG/13 15	Publish the document in WP/06, Appendix B, which maps APAC Seamless ANS Plan Priority 1 Elements to the GANP's ASBU AMET elements, accordingly as a companion (appendix) to the Seamless ANS Plan. [Ref: MET/R WG/13 Report, 3.41.]	ASAP	Secretariat	To begin
MET/R WG/13 16	Update the MET/R WG work plan to reflect that the ad hoc group on MET information needed to support the elements of the APAC Seamless ANS Plan would continue to review and propose future updates to the mapping document based on future updates of the Seamless ANS Plan and to map the APAC Seamless ANS Plan Priority 2 and 3 Elements to the GANP's ASBU AMET elements. [Ref: MET/R WG/13 Report, 3.42.]	ASAP	Secretariat	To begin
MET/R WG/13 17	Review the terminology used to describe the MET service users to ensure the MET/R WG terms of reference sufficiently address the need to support all MET service users, including those stipulated in ICAO Annex 3, para. 2.1.2), which might not be identified in the definition of ATM (i.e., air traffic services, airspace management and air traffic flow management). [Ref: MET/R WG/13 Report, 4.2.]	ASAP	Chair and Secretariat	To begin
MET/R WG/13 18	Continue to facilitate and encourage participation in the MET/R WG by representatives from IATA and IFALPA. [Ref: MET/R WG/13 Report, 5.1.]	ASAP	Chair and Secretariat	To begin

Unresolved action items recorded by MET/R WG/11

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
MET/R WG/11 01	Propose further updates to the (MET/R WG work plan) Deliverable No. 2 and Deliverable No. 5 timeframe, responsibility, and requirements details. [Ref: MET/R WG/11 Report, 5.2.] - Deliverable 2: <i>Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ANS Plan</i> - Deliverable 5: <i>A coordinated review of the APAC ANP Volume III, including proposals for improvements to the ANRF and other parts of Volume III, to clarify the MET-related implementation planning guidance</i>	MET/R WG/12	Chair and Secretariat	In progress To begin

Unresolved action items recorded by MET/R WG/09

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
MET/R WG/09 01	Publicise the SIGMET Guide and, in particular, the guidance indicating the importance of exchanging special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices (AMOs)) in support of improved SIGMET service and flight safety, by way of ICAO State letter (and/or other channels) with distribution to pilots and	July 2020 Ongoing	Secretary and MET/R WG members	Superseded by action item MET/R WG/13-02 In progress

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
	ATS units supported by States and relevant s organisations, as appropriate [include reference to the ICAO APAC Webinar on <i>Special Air-Reports needed by MET to Support Flight Safety</i> , conducted on 17 June 2021]			

Extract from MET SG – LIST OF ACTIONS(Note: Proposed updates are indicated with ~~strike through~~ and **highlighted text**)**New action items recorded by MET SG/27**

MET SG – LIST OF ACTIONS				
Action No.	Detailed description of actions	Responsibility	Target date	Status
...				
27/02	<p>Updates to the ICAO APAC ROBEX Handbook: Coordinate with all the States concerned (ref: MET SG/27, WP/09 and WP/14) to incorporate the proposed updates in the ROBEX Handbook, Sixteenth Edition [ACTION MET SG/27-02] [Ref: Report of MET SG/27, para. 4.4.]</p> <p>Ref: MET/IE WG22, WP/19. Ref: MET/R WG/13 Report, para. 2.09., and MET/R WG/13 action item 03.</p>	Secretariat	Dec 2023	IN PROGRESS TO COMMENCE
...				
27/05	<p>Document of cases of SIGMET coordination: Identify common SIGMET coordination practices from the document of cases of SIGMET coordination in WP/11 and develop further the document to separate the procedural information, which could potentially be used to supplement to the Asia/Pacific Regional SIGMET Guide. [Ref: Report of MET SG/27, para. 4.16.]</p> <p>Ref: MET/R WG/13 Report, para. 2.10., and MET/R WG/13 WP/09 – SIGMET coordination common practices and guidelines</p>	Ad hoc group	Jul 2024 (MET SG/28)	IN PROGRESS TO COMMENCE
...				
27/07	<p>Update of VAAC backup procedures in APAC Regional SIGMET Guide: Include the proposed updates for the example in Appendix A of WP/10 and the proposal in WP/13 in the eleventh edition of the Asia/Pacific Regional SIGMET guide. [Ref: Report of MET SG/27, para. 4.22.]</p> <p>Ref: MET/R WG/13 Report, para. 2.09., and MET/R WG/13 action item 03.</p>	Secretariat	Dec 2023	IN PROGRESS TO COMMENCE
...				
27/13	<p>APAC SIGMET coordination activities Proposed amendment to ICAO Annex 3: Update the online repository with the new SIGMET coordination activities between China and adjacent countries. [Ref: Report of MET SG/27, para. 6.6.]</p> <p>Ref: MET/R WG/13 Report, para. 2.11.</p>	Ad hoc group	Dec 2023	COMPLETED TO COMMENCE

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**ICAO ASIA AND PACIFIC METEOROLOGICAL REQUIREMENTS WORKING GROUP
(MET/R WG)**

TERMS OF REFERENCE AND WORK PLAN

Editorial note: Proposed updates show deleted text using ~~text to be deleted~~ and added text with grey shading (text to be inserted).

TERMS OF REFERENCE

DESCRIPTION	
Name and establishment of the group	The Meteorological Requirements Working Group (MET/R WG) was established by the Meteorology Sub-group (MET SG) of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) [MET SG/19, Decision 19/2 refers].
Administrative arrangements	The membership and appointment of members, chairing, frequency of meetings and quorum, and recording of meetings shall be determined and conducted following the working arrangements and instructions provided in the APANPIRG Procedural Handbook.
Reporting mechanism	The MET/R WG shall report its work progress and coordination requirements to the MET SG, generally in a report to the MET SG meeting presented by the chairperson of the MET/R WG. The MET/R WG may also provide reports to other relevant bodies as necessary (e.g., contributory bodies of APANPIRG) with assistance from the ICAO Secretariat.
Objective	Improve safety, efficiency and sustainability of air traffic management (ATM ¹) operations by providing meteorological (MET) information needed to meet current and future requirements of the ATM system.
Benefits	Increase safety – optimize safety risk management Increase efficiency – save time and fuel Increase sustainability – reduce carbon emissions
Functions and delegated authority	Under guidance from the ICAO Secretariat, support the MET SG to assist APANPIRG in its planning and implementation work by carrying out designated tasks on specifically defined problems, including: <ul style="list-style-type: none"> a) Coordinate with other relevant contributory bodies of APANPIRG such as ATM/SG and ATFM/SG; b) Recommend updates to the Asia/Pacific Regional Air Navigation Plan and other regional guidance material as necessary, based on analysis and evaluation of the current and future requirements for MET information in support of ATM, as well as ATM information required to support the provision of MET services; c) Facilitate the exchange of expertise in the Asia/Pacific Region on the integration of MET information into ATM systems to support collaborative decision making (CDM) and the migration of MET information into the SWIM environment; d) Facilitate the monitoring and implementation of the sub-regional exchange of MET information (including in digital format) and associated inter-agency agreements that support the integration of MET information in ATM operations in line with the priorities defined in the ASIA/PAC Seamless ATM Plan; e) Promote coordination between the MET and ATM communities in the Asia/Pacific Region to enhance the level of understanding of MET requirements and capabilities in support of ATM; and f) Report to the MET SG for further coordination through the ICAO Secretariat with APANPIRG and other relevant bodies.

¹ ATM: the dynamic, integrated management of air traffic and airspace including air traffic services, airspace management and air traffic flow management — safely, economically and efficiently — through the provision of facilities and seamless services in collaboration with all parties and involving airborne and ground-based functions [ICAO Doc 4444, PANS ATM]

MET SG/28–WP/04–APPENDIX B

Agenda Item 2

08-12/07/2024

- 2 -

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COMMUNICATION STRATEGIES				
Description	Target Audience	Delivery Method	Frequency / Date	Responsibility
Work Plan	MET/R WG, MET SG	Document via e-mail and MET/R WG meeting	As required, but reviewed at MET/R WG and MET SG meetings	Chair and Secretariat
Interim Work Program Progress Report	MET/R WG Members	Web-conference E-mail	Quarterly/as determined by Chair	Chair and Secretariat
MET Chairs Coordination Meeting	Chairs of MET SG and its contributory working groups	Web-conference E-mail	Quarterly	Chair and Secretariat
General correspondence	MET/R WG Members	E-mail	As required	MET/R WG Members
MET/R WG Meeting	MET/R WG Members	Meeting (face-to-face or tele- /web-conference)	As required	Chair and Secretariat
Status and Milestone Reports	MET/R WG Members	E-mail and working paper at MET/R WG meeting	At least annually	Chair and Secretariat
MET/R WG Report	MET SG and ATFM SG (and ATM/SG, through MET SG) and all APAC States	ICAO website and working paper at MET SG meeting	Following each MET/R WG meeting	Chair and Secretariat

PLAN OF WORK

DELIVERABLES
1. Documented analysis of MET information used in the Region specifically to support ATM operations
2. Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan
3. Draft regional guidance material for tailored MET information supporting ATM operations
4. Strengthen collaboration and relationship between MET, ATM and Airspace Users
5. Coordinated review of the APAC ANP Volume III, including proposals for improvements to the ANRF and other parts of Volume III, to clarify the MET-related implementation planning guidance
6. Development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM
7. Promote and assist ATM and Airspace Users with user education on the Space Weather Advisory service
8. Meteorological Information for the Asia Pacific Regional Framework for Collaborative ATFM
9. SIGMET coordination activities in APAC Region

MILESTONES	By date	Responsibility	Status
1. Deliverable 1: Analysis of MET information requirements (current and future) for the Region specifically to support ATM operations			
Final draft documented analysis of the survey of MET information requirements (current and future) for the Region specifically to support ATM operations	MET/R WG/13 MET SG/27	Ad hoc Group: Rapporteur-Australia, Singapore, New Zealand, China, Japan, Thailand, Hong Kong China, Viet Nam	Completed In-progress
1.1. Identify follow-up actions (including presenting the results at ATM and Airspace Forums)	MET SG/2728	Ad hoc Group (above)	In progress
1.2. Formulate a proposal for the timing and content of a future survey	MET SG/28 ATM/SG/	Ad hoc Group (above) plus others identified in ATFM/SG/14 and MET/R WG/13	
2. Deliverable 2: Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ANS Plan			
Initial development (of the list of MET information or services necessary to support implementation of the	MET/R WG/13	Ad hoc group: Rapporteur-Singapore, Australia, China,	Completed On hold

MILESTONES	By date	Responsibility	Status
priority 1 elements of the Asia/Pacific Seamless ANS Plan) in coordination with ATFM/SG		Hong Kong China, Japan, Thailand	
2.1. Further development (of the list of MET information or services necessary to support the implementation of the priority 2 and 3 elements of the Asia/Pacific Seamless ANS Plan) in coordination with ATFM/SG	MET/R WG/14 and ATFM/SG/15	Ad hoc group: Rapporteur-Singapore, Australia, China, Hong Kong China, Japan, Thailand	In progress
3. Deliverable 3: Regional guidance material for tailored MET information supporting ATM operations			
Finalize and submit to MET SG/26 the proposed updates to the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations – as agreed in Decision MET/R WG/11/01, part a), and Draft Decision MET/R WG/11/02,	MET SG/26	Ad hoc group	Completed
Provide the Secretariat examples on State's post operational analysis and suggestions regarding the amendment to the Guidance document to enhance the post-operational analysis framework – as agreed in Decision MET/R WG/11/01, part b)	30 November 2022	MET/R WG members	Completed
Enhance the contents relevant to post-operational analysis in the main body of the Guidance based on the information provided by the MET/R WG members	MET/R WG/12	Ad hoc group	Superseded by 3.4
Review the draft Guidance attached to MET/R WG/12 WP/11 and provide comments to the ICAO RO MET	14 July 2023	MET/R WG and ATFM SG members	To begin Completed
Consider including States implementation example reported by IP06 and IP04 and finalize and submit to MET SG the proposed updates to the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations – as agreed in Decision MET/R WG/12/xx	MET SG/27	Ad hoc group: Rapporteur-Japan, Australia, China, Hong Kong, China, Republic of Korea, Singapore, Thailand, Vietnam and IATA	To begin Superseded by 3.3
3.1. Share the States' practices and challenges of verification and evaluation of impact-based MET information to support ATM operation in the MET/ATM seminar and/or MET/R WG/13 and the ad hoc group analyze provided information and consider appropriate actions, such as include it to the Guidance	MET/R WG/13/14	MET/R WG members	To begin In progress
3.2. Analyze provided information under 3.1 and other information in the WG meetings/Seminars and consider appropriate actions, such as including it in the Guidance.	MET/R WG/14	Ad hoc group: Rapporteur-Japan, Australia, China, Hong Kong, China, Republic of Korea, Singapore, Thailand, Vietnam and IATA	To begin
3.3. Consider including China's implementation example (MET/R WG/13 – IP02) and finalize and submit the proposed updates to the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations to MET SG – as agreed in Decision MET/R WG/13-02			To begin
4. Deliverable 4: Strengthen collaboration and relationship between MET, ATM and Airspace Users			
Report to ATFM/SG (and ATM SG) (including the following topics: MET/ATM webinar 2022 outcomes, MET/ATM survey results, updates on the regional MET/ATM guidance document, education on the SWX advisory service, guidance on exchanging special air-reports, etc.)	ATFM/SG/12	Chair and Secretariat	Completed
Plan for a future seminar on regional implementation of MET information to support ATM operations	MET SG/26	Chair and Secretariat in coordination with ATM/SG	Completed
Plan to conduct MET/R WG/13 in conjunction with ATFM/SG/14 to include a joint plenary component on matters of importance to both groups, including a Seminar on MET/ATM collaboration	MET SG/27	Chair and Secretariat in coordination with ATFM/SG Chair	Completed
4.1. Plan to conduct MET/R WG/14 in conjunction with ATFM/SG/15 to include a joint plenary component on matters of importance to both groups, including a Seminar on MET/ATM collaboration	MET SG/28	Chair and Secretariat in coordination with ATFM/SG Chair	To begin

MILESTONES	By date	Responsibility	Status
4.2. Develop content for the Seminar on MET/ATM collaboration, such as examples of collaboration in the region and how to improve special air reports (ARS) availability	MET/R WG/14, MET/ATM Seminar	Secretariat in coordination with experts from States, including Fiji and India	To begin
4.3. Report outcomes of the MET/ATM Seminar to MET SG, including issuing a state letter to encourage the States to improve ARS availability and make use of the reports in SIGMET issuance	MET SG/29	Chair and Secretariat	To begin
5. Deliverable 5: A coordinated review of the APAC ANP Volume III, including proposals for improvements to the air navigation reporting form (ANRF) and other parts of Volume III, to clarify the MET-related implementation planning guidance			
5.1. Support MET SG with the development of MET-specific requirements in the ANP, Volume III; giving consideration to: <ul style="list-style-type: none"> i. The need to coordinate development of proposals for the ANP Volume III with the other APANPIRG Sub-Groups; ii. The implications of the proposed project to migrate the APAC Seamless ANS Plan and other regional plans and guidance material into ANP Volume III; and iii. Examples of ANP Volume III from other ICAO regions 	MET SG/27	Rapporteur-Secretariat, Australia, Hong Kong China, IATA, Japan, Singapore, Thailand	To begin Pending outcomes of ICAO's development on the eANP system
6. Deliverable 6: Development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM			
6.1. In coordination with other related sub-groups, working groups, etc., identify: i) SWIM-based MET information affecting ATFM operations; ii) how often these products be provided and rules for updates to meet the ATFM needs; and (iii) identify any other information required by ATFM and gaps to meet the needs of ATFM users	MET SG/27	Ad-hoc group (see below)	Completed In-progress
6.2. Identify MET and ATFM data to be exchanged using SWIM-based Information Exchange Service	MET SG/27	Ad-hoc group (see below)	Completed In-progress
6.3. Based on the findings (above), develop APAC use cases and a user requirements document for future SWIM-based MET information services supporting ATFM	MET SG/27	Ad-hoc group (see below)	Completed In-progress
6.4. Review the proposed updates to the draft reference document in Attachment A to MET/R WG/12 WP/12 and provide comments and suggestions for additional use cases, if any, to the ICAO Secretariat	14 July 2023	MET/R WG members and ATFM/SG members	Completed In-progress
6.5. Submit an updated version of the reference document to MET SG for review, giving consideration to the comments and suggestions received in 6.4.	MET SG/27	Ad-hoc group (see below)	Completed In-progress
6.6. Submit the draft reference document to MET SG and ATM SG for review, including proposals to publish the document on the ICAO website and a procedure for updating it as a living document	MET SG/28 and ATM/SG/	Ad-hoc group (see below)	To begin
7. Promote and assist ANSPs and Airspace Users with user education on the Space Weather Advisory service			
7.1. Seek input from end users (by way of questionnaire) on the content of a SWX workshop or seminar	MET SG/28 MET SG/27	Secretariat and MET/R WG members	To begin
7.2. Seek input from end users on the content of a SWX advisory exercise	MET SG/28 MET SG/27	Secretariat and MET/R WG members	To begin
7.3. Deliver information on Space Weather service to participants at the ICAO APAC MET/ATM seminars	MET/ATM seminars 2022 and 2023, 2024	Australia	Completed
8. Meteorological Information for the Asia Pacific Regional Framework for Collaborative ATFM			

MILESTONES	By date	Responsibility	Status
8.1. Review Meteorological Information for ATFM (paragraphs 5.59-5.67) in the Regional Framework Document for Collaborative ATFM and provide inputs of the latest examples to the ICAO Secretariat and the task coordinators [Ref: Decision MET/R WG/11/05]	17 June 2022	MET/R WG members	Completed
8.2. Provide input on seasonal meteorological information for the Regional Framework	TBC	MET/R WG members	Pending advice from ATFM/SG
9. SIGMET coordination activities in the APAC Region: Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States and administrations.			
9.1. Maintain the online repository on SIGMET coordination activities in the APAC Region.	MET/R WG/14	Ad hoc group on SIGMET Coordination:	
9.2. Identify common SIGMET coordination practices from the document of cases of SIGMET Coordination practices and seek further inputs from States' current practice. The following points to consider: <ul style="list-style-type: none"> Collect more practices on TC SIGMET handover procedures and analyzing them to seek possible inclusion to the Regional SIGMET Guide (MET/R WG/13 – WP/09) VA SIGMET issuance over the multiple FIR (MET/R WG/13 – WP/10, 2.1-2.2) Collect more practices on SIGMET coordination procedure in addition to MET/R WG/13 – WP/08 (Appendix A) and seek any input to Appendix L of the Regional Guidance. 	MET/R WG/14	Joint Rapporteurs: - Hong Kong China (Christy Leung) - Japan (Michiko Ikeda) - Singapore (Goh Wee Poh) Other members: - China (Lin Caiyan) - Fiji (Samisoni Waqavakatoga) - IFALPA (Jaffar Hassan) - India (VR Durai, Dr Neeti Singh) - Indonesia (Resa Pratikasari, Nurul Hidayati) - Malaysia (Rafizam Ramli, Nik Nur Aimi Syahirah Nik Adnan, Chai Mui Fatt) - Thailand (Rassmee Damrongkietwattana) - Vietnam (Le Quang Hung, Vu Thi Thanh Tam)	
9.3. Propose the SIGMET coordination guidance in the Regional SIGMET Guide following findings from 9.2 The following points to consider: <ul style="list-style-type: none"> Possible common WS SIGMET (TS) issuance criteria in the Asia/Pacific Region (MET/R WG/13 – WP/09, Appendix B) Considerations on criteria for convective system straddle across multiple FIR (MET/R WG/13 – WP/09, Appendix C) 	MET SG/28		
9.4. Review, organise and support surveys on user requirements of SIGMET coordination	MET/R WG/14		

Ad-hoc group for Deliverable 6: Development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM			
State / Administration / IO	Name	Position and/or Organisation	Expertise
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Australia	Ashwin Naidu	BOM	MET
CANSO	Stuart Ratcliffe	CANSO	ATFM
Hong Kong China	Marco Kok (Rapporteur)	HKO	MET/SWIM
Hong Kong China	John Chong	HKO	MET
Hong Kong China	Anfernee Poon	Acting Senior Operations Officer (Strategic Planning) / HKCAD	ATFM
IATA	John Moore	IATA	ATFM/MET
Japan	YONE Toshihiro	JCAB	ATFM
Japan	IKEDA Michiko	JMA	MET
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Singapore	Zhang HuanBin	Head, ATM development/CAAS	ATFM
Singapore	Jack Toh	Head (ATM Info System)	ATFM
Singapore	Yeo Cheng Xun	MSS	MET
Thailand	Amornrat Jirattigalachote (Amo)	Strategic Planning Manager /AEROTHAI	ATFM/SWIM
Thailand	Dudsadee Sungthong	Strategic ATFM Team/AEROTHAI	ATFM
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