INTERNATIONAL CIVIL AVIATION ORGANISATION

REPORT OF THE FOURTEENTH MEETING OF THE METEOROLOGICAL REQUIREMENTS WORKING GROUP (MET/R WG/14) AND SEMINAR ON METEOROLOGY AND AIR TRAFFIC MANAGEMENT (MET/ATM SEMINAR)

28 April – 2 May 2025

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

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

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HISTORY OF THE MEETING AND SEMINAR

1. Dates and venue

1.1. The ICAO Asia and Pacific (APAC) Office hosted the Fourteenth Meeting of the Meteorological Requirements Working Group (MET/R WG/14) from 28 April to 2 May 2025, including the ICAO APAC Seminar on Meteorology and Air Traffic Management (MET/ATM Seminar) on 28 April 2025, in conjunction with the Fifteenth Meeting of the APAC Air Traffic Flow Management Steering Group (ATFM/SG/15). A joint plenary session of MET/R WG/14 and ATFM/SG/15 was conducted on 30 April 2025.

2. Attendance

2.1. MET/R WG/14 was attended by sixty (60) participants from seventeen (17) States and organizations, namely Australia, Bhutan, Brunei Darussalam, China, Hong Kong China, India, Indonesia, Japan, Malaysia, Papua New Guinea, Philippines, Republic of Korea, Singapore, Solomon Island, Thailand, Vietnam and ICAO. The list of participants is in **Appendix D**.

2.2. The MET/ATM Seminar (on 28 April 2025) was attended by one hundred and sixty-two (162) in-person participants (MET/R WG/14 and ATFM/SG/15) and an additional seventy-three (73) online participants.

2.3. Information on the ATFM/SG/15 meeting is available on the following website: https://www.icao.int/APAC/Meetings/Pages/2025-ATFM-SG-15.aspx.

3. Officers and Secretariat

3.1. Mr Ashwin Naidu, Aviation Customer Lead, Australian Bureau of Meteorology, presided as the MET/R WG/14 meeting chairperson. Mr Peter Dunda, Regional Officer, Aeronautical Meteorology and Environment, ICAO APAC Office, assisted as Secretary.

3.2. Mr Ashwin Naidu, Mr Piyawut Tantimekabut, ATM Expert (Director Level), AEROTHAI, Thailand, and Mr Peter Dunda moderated the MET/ATM Seminar.

3.3. Mr Ashwin Naidu and Mr Piyawut Tantimekabut presided as chairpersons of the joint plenary session of MET/R WG/14 and ATFM/SG/15.

4. Language and Documentation

4.1. The meeting and seminar's working language was English, including all documentation and this Report. The meeting considered thirteen (13) Working Papers (WPs) and nine (9) Information Papers (IPs). The seminar considered twelve (12) Slide Presentations (SPs). The list of papers and presentations is in **Appendix E**.

4.2. The joint session on 30 April 2025 considered one (1) additional Flimsy, one (1) additional WP, and one (1) additional IP submitted to ATFM/SG/15, which are available on the following ICAO APAC Office website: https://www.icao.int/APAC/Meetings/Pages/2025-ATFM-SG-15.aspx.

5. Outcomes

5.1. The MET/R WG records outcomes of its discussions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

a) **Draft Conclusions:** formulated by the MET/R WG for further consideration by the Meteorology Sub-Group (MET SG), deal with matters of a technical nature and regional applicability that, according to the MET SG's terms of reference, require the attention of

States or action by the ICAO, following established APANPIRG[1] procedures;

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

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

5.2. The meeting formulated one (1) Draft Conclusion and no Draft Decisions, and adopted seven (7) Decisions as tabulated in **Appendix A** and listed below:

- **Draft Conclusion MET/R WG/14-01**: To include mapping of MET information needed to support APAC Seamless ANS Plan (ASAP) elements as an Appendix
- **Decision MET/R WG/14-02**: Deliverable 2 of MET/R WG workplan as completed
- **Decision MET/R WG/14-03**: Finalisation, Communication, and Future Planning for the Regional Survey on MET Services Supporting ATM
- **Decision MET/R WG/14-04**: Updating the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations (MET-ATM Guidance)
- **Decision MET/R WG/14-05**: Enhancing the *APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM* with an additional use case
- **Decision MET/R WG/14-06**: Updating the *APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM*
- **Decision MET/R WG/14-07**: Consolidate user feedback on WC SIGMET issuance procedures for inclusion in APAC Regional SIGMET Guide
- **Decision MET/R WG/14-08**: Collecting States' practices and user requirements on the WS SIGMET validity duration

5.3. In addition, the meeting agreed to two (2) new action items, as indicated in the *Report on Agenda Items* below and presented in the *List of Actions* in **Appendix B**.

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[1] ICAO Asia/Pacific Air Navigation Planning and Implementation Regional Group

REPORT ON AGENDA ITEMS – MET/R WG/14

1. Organisational matters

WP/01 – Provisional Agenda (Secretariat)

1.1. 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: SIGMET coordination
Agenda Item 5: Future work program and terms of reference
Agenda Item 6: Any other business
Agenda Item 7: Next Meeting

1.2. Concerning attendance, the Chair noted no participants from international organisations, including IATA, IFATCA, IFALPA and CANSO.

2. Review outcomes of related meetings

WP/02 – FOLLOW-UP ACTION FROM MET/R WG/13 (Secretariat)

2.1. The Thirteenth Meeting of the Meteorological Requirements Working Group (MET/R WG/13) in Bangkok, Thailand, from 22 to 26 April 2024, included the ICAO APAC Seminar on Meteorology and Air Traffic Management (MET/ATM Seminar) and a joint plenary session with the Fourteenth Meeting of the APAC Air Traffic Flow Management Steering Group (ATFM/SG/14). MET/R WG/13 adopted seven Decisions and eighteen new action items for the MET/R WG List of Actions.

2.2. The meeting reviewed and proposed updates to the status of follow-up actions from MET/R WG/13. The status of follow-up action on the MET/R WG/13 Decisions is indicated in **Appendix A**, and the status of follow-up action on the MET/R WG List of Actions is indicated in **Appendix B**.

2.3. The meeting noted that follow-up action was completed for four of the seven MET/R WG/13 Decisions. However, follow-up action remained outstanding for the following three Decisions:

- 13-03: Publishing the Survey of State MET Information Supporting ATM
- 13-04: Follow-up Survey of State MET Information Supporting ATM
- 13-06: Mapping of APAC Seamless ANS Plan to ASBU AMET elements

2.4. The meeting recognised that the action required under Decisions 13-03, 13-04 and 13-06 were duplicated by new action items 13-12, 13-13 and 13-15 in the List of Actions. Therefore, the meeting agreed to close those redundant action items and continue monitoring progress on the Decisions.

2.5. The meeting noted that thirteen action items in the MET/R WG List of Actions were completed or closed, leaving six requiring monitoring and follow-up action.

WP/03 – FOLLOW-UP ACTION FROM MET SG/28 (Secretariat)

2.6. The Twenty-eighth Meeting of the Asia/Pacific Meteorology Sub-Group (MET SG/28) in Bangkok, Thailand, from 8 to 12 July 2024, resulted in one Draft Decision for further consideration by the APAC Air Navigation Planning and Implementation Regional Group (APANPIRG), two Conclusions, seven Decisions, and thirty-two new action items.

2.7. The meeting reviewed the follow-up status on these outcomes and considered further actions for the MET/R WG. The status of follow-up action on the MET SG/28 Conclusions and Decisions and action items is indicated in WP/03, Appendices A and B.

2.8. The MET/R WG Chair acknowledged that MET SG/28 had identified shortcomings in considering and drafting Decisions from MET/R WG/13. As a result, it was emphasised that any decisions adopted at this meeting should be documented and aligned with ICAO APANPIRG requirements to ensure effective follow-up and implementation.

WP/04 – FOLLOW-UP ACTION FROM APANPIRG/35 (Secretariat)

2.9. The Thirty-Fifth Meeting of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/35) in Bangkok, Thailand, from 25 to 27 November 2024, resulted in eleven Conclusions, which require the attention of States or actions by ICAO, and two Decisions, which deal with the internal working arrangements of APANPIRG and its contributory bodies.

2.10. The meeting reviewed outcomes directly relevant to the MET/R WG work plan and considered further actions to support follow-up on these outcomes. The APANPIRG/35 outcomes of direct relevance to the MET/R WG included Conclusion 35/13, which involves updating information in the APANPIRG Air Navigation Deficiencies Reporting Form, and Decision 35/11, which involves additional secretariat support.

2.11. Regarding APANPIRG Decision 35/11, the meeting noted that ICAO was supporting the capacity of the regional MET secretariat by recruiting additional officers.

2.12. Regarding APANPIRG Conclusion 35/13, the meeting noted that twelve air navigation deficiencies related to MET in the APAC region required rectification.

2.13. The Solomon Islands informed the meeting of its intention to prepare a report addressing the deficiency (Index No. AP-MET-20) related to the provision of WAFC forecasts for further consideration at MET SG/29 (note: further discussion on this matter under IP/02).

WP/06 – MET INFORMATION NEEDED TO SUPPORT THE ELEMENTS OF THE APAC SEAMLESS ANS PLAN (MET/R WG Ad-hoc Group)

2.14. The designated ad hoc group further analysed and mapped ASBU AMET elements to support Priority 2 elements of APAC Seamless ANS Plan (ASAP) as requested by the previous meeting, MET/R WG/13, in Decision 13-07 and action item 13-16. Further discussion is documented under WP/06 in the report on the joint session between MET/R WG/14 and ATFM/SG/15.

3. Collaboration between MET and ATM stakeholders

IP/03 – THE DEVELOPMENT OF USER-CENTRIC ENGAGEMENT STRATEGIES AND FIT-FOR-PURPOSE PRODUCTS IN SOUTH-WEST CHINA (China)

3.1. China's Southwest Regional Meteorological Centre has established a closed-loop mechanism to achieve demand-to-product transformation. To address the needs of various aviation users, a dedicated Aviation MET consultant working group provides tailored "one-to-one" services using a dynamic "User Demand Dashboard". During and after severe weather, meteorologists are embedded in ATC/airline operations to document pain points and conduct post-event decision retrospectives.

3.2. The User-Centric approach effectively enhanced aviation weather service relevance and practicality, with improved convective warning lead times, higher flight normality rates, and reduced operational disruptions.

IP/04 – TEMPORAL AND SPATIAL CHARACTERISTICS OF AIRCRAFT TURBULENCE ON THE SLOPE OF QINGHAI-TIBET PLATEAU AND TURBULENCE FORECASTING SYSTEM BASED ON EDR (China)

3.3. From January 2015 to March 2025, Lanzhou Controlled Airspace reported 1,418 aircraft turbulence events, with 62.20% occurring above 6,600 meters. The number and intensity of turbulence events have increased annually, especially at high altitudes, due to global climate change and increased flights. Turbulence is more frequent in spring and winter, accounting for 69.38% of yearly events. Most turbulence occurs from 00:00 to 13:00 UTC, peaking at 05:00 UTC. Severe turbulence increases after dusk, peaking at 20:00 UTC. Turbulence is concentrated at FL180-FL200 and FL280-FL360. A turbulence forecasting system based on EDR data provides high-resolution forecasts, performing comparably with WAFS.

IP/05 – EN-ROUTE TURBULENCE DETECTION USING ADS-B DATA (Hong Kong, China)

3.4. This paper presented an algorithm to detect en-route aviation turbulence using information from ADS-B navigation data. A metric of root-mean-square vertical acceleration (RMSVA) is defined, and the temporal spike properties are investigated to formulate the detection algorithm. A real-time operational run has been implemented since November 2024, and the additional turbulence information could raise user situational awareness of aviation turbulence.

IP/07 – PROBABILISTIC FORECAST OF RUNWAY HEADWIND CHANGES AT THE HONG KONG INTERNATIONAL AIRPORT FOR SUPPORTING ATM OPERATIONS (Hong Kong, China)

3.5. Hong Kong, China, presented the case study of probabilistic forecast of runway headwind changes for supporting estimation of Airport Acceptance Rate in Hong Kong, China. An AI model was designed for assessing the likelihood of sea breeze occurrences and westerly winds reaching 5 knots at Hong Kong International Airport. The machine learning model provided hourly probabilistic forecasts, with verification showing good alignment between predictions and actual observations. Practical examples demonstrated how ATM can utilize these forecasts for operational estimation of the Airport Acceptance Rate and early decision-making preparedness for runway use.

Joint Session of MET/R WG/14 and ATFM/SG/15, incl. MET/ATM Seminar Report

(ATFM/SG/15) Flimsy 03 – MET/ATM Seminar Report (Secretariat)

3.6. The Secretariat provided a summary of the MET/ATM Seminar. The presentations are available on the meeting website: https://www.icao.int/APAC/Meetings/Pages/2025-MET-R-WG14.aspx.

WP/06 – MET INFORMATION NEEDED TO SUPPORT THE ELEMENTS OF THE APAC SEAMLESS ANS PLAN (MET/R WG Ad-hoc Group)

3.7. An ad hoc group of Australia, China, Hong Kong China, Japan, Singapore, and Thailand was formed to analyse the MET information/services required to support the APAC Seamless ANS Plan (ASAP) under the MET/R WG work plan. The group completed and presented their analysis to ATM SG/5, however, the above deliverable remained in the MET/R WG work plan for further updates.

3.8. In 2024, the group updated their analysis considering the Global Air Navigation Plan (GANP) 2019 and ASAP. This updated analysis, which included a mapping document, was presented during the joint plenary session of MET/R WG/13 and ATFM/SG/14. The mapping document was recognised as beneficial and recommended for publication as an appendix to the ASAP.

3.9. The MET information/services required to support ASAP were identified from the Aviation System Block Upgrade (ASBU) and regional elements included in ASAP. The ad hoc group further analysed and mapped ASBU AMET elements required to support Priority 2 elements (in addition to Priority 1) of ASAP. It was assessed that it was sufficient to implement AMET-B0/1-4 within ASBU for Priority 1 elements, and AMET-B1/1-4, AMET-B2/1-2, and AMET-B2/4 for recommended technological upgrades and supporting FF-ICE services.

3.10. The updated mapping was proposed as an appendix to ASAP to improve information management and reduce confusion. Priority 1 and 2 ASAP elements are critical and recommended for regional benefits.

3.11. The meeting supported the proposal and formulated the following Draft Conclusion:

Draft Conclusion MET/R WG/14–01: To include mapping of MET information needed to support APAC Seamless ANS Plan (ASAP) elements as an Appendix	
What: That, the Secretariat to publish the mapping document (MET/R WG/14, WP/06, Appendix B) as an appendix to the APAC Seamless ANS Plan (ASAP)	Expected impact: Economic Ops/Technical
Why: The mapping document provides the MET information required to support the Priority 1 and 2 elements of the ASAP via a mapping analysis. These elements are critical and recommended upgrades that would bring potential benefits to the region. To ensure effective document management and user awareness, this appendix will be updated in tandem with ASAP.	Follow-up:
When: MET SG/29	Status: Adopted by MET/R WG and ATFM SG
Who: Sub groups, ICAO APAC RO	

3.12. The ad-hoc group clarified that during the analysis, it had determined that mapping ASBU AMET elements to ASAP Priority 3 elements would be of limited use at this stage due to its limited implementation in the APAC region. The ad-hoc group thus decided to focus on the mapping of critical and recommended upgrades (identified as Priority 1 and 2) to maximise global ANS benefits.

3.13. The meeting also agreed that while future updates to the mapping may be required in response to expected updates to the GANP, the ad hoc group had completed its task (i.e., MET/R WG, work plan, Deliverable 2: Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan) and adopted the following Decision:

Decision MET/R WG 14–02: Deliverable 2 of MET/R WG workplan as completed	
What: That, the MET/R WG considers Deliverable 2 (*Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan*) of the MET/R WG workplan as completed and closed. The ad-hoc group will be dissolved thereafter.	Expected impact: Ops/Technical

Why: The ad-hoc group has completed the analysis on the MET information required to support the Priority 1 and 2 elements, and considered the requirements for Priority 3, of the ASAP. This include a mapping document that will be included as an appendix to the ASAP to ensure effective document management and user awareness.	Follow-up:
When: MET/R WG/14	Status: Adopted by MET/R WG
Who: Sub groups, MET/R WG	

WP/11 – FOLLOW-UP ON THE SURVEY OF STATE MET INFORMATION SUPPORTING ATM AND DEVELOPMENT OF FUTURE ACTIVITIES (MET/R WG ad hoc group)

3.14. In late 2021, ICAO APAC conducted a regional survey to assess MET services supporting ATM and ATFM. The survey outcomes were reviewed in 2024 by MET/R WG/13 and ATFM/SG/14. Subsequently MET SG/28 supported the draft final report's publication, subject to data sensitivity, intended use, and sharing mechanisms.

3.15. MET SG/28 requested further refinement of the 2021 survey report to align with data protection principles and clarify its use and sharing approach (MET SG Action 28/23). WP/11 invited MET/R WG/14 and ATFM/SG/15 to review the final draft, remove sensitive data, define use cases, and recommend publication platforms.

3.16. MET SG/28 also requested an assessment of the 2021 survey's value and lessons learned (MET SG Action 28/24). WP/11 invited MET/R WG/14 and ATFM/SG/15 to review the survey's impact and challenges, and to consider how its insights could shape future surveys.

3.17. MET SG/28 asked the Secretariat to present the 2021 survey outcomes to the ATM Sub-Group (MET SG Action 28/25). WP/11 proposed that ATFM SG, on behalf of, MET/R WG/14 and ATFM/SG/15 should develop key messages and present a summary to ATM SG/13, encouraging stakeholder input.

3.18. The meeting noted that the ad hoc group would further refine the 2021 report, develop a follow-up survey concept, and consider a new regional survey, subject to MET SG/29 and ATM/SG/13 endorsement.

3.19. The joint plenary session invited ATFM SG to join this ad-hoc group to ensure that inputs from ATM and ATFM stakeholders are adequately captured in future survey.

3.20. The meeting supported the proposal and adopted the following Decision:

Decision MET/R WG 14–03: Finalisation, Communication, and Future Planning for the Regional Survey on MET Services Supporting ATM	
What: That, the MET/R WG ad hoc group, in coordination with ATFM SG, (1) finalise and publish the refined 2021 survey report on MET services supporting ATM on the ICAO APAC eDocuments website; (2) develop a draft framework and concept note for a future regional survey for review at MET/R WG/15 and ATFM SG/16; and (3) support the ATFM SG in preparing a summary of the 2021 survey outcomes for presentation to ATM SG/13.	Expected impact: Ops/Technical
Why: To follow up the actions from MET SG/28 by making the 2021	Follow-up:

survey findings accessible, ensuring informed planning of a future survey aligned with operational priorities, and promoting ATM stakeholder awareness of MET capabilities and requirements in ATFM planning.	
When: (1) MET SG/29, (2) MET/R WG/15 and ATFM SG/16, (3) ATM SG/13	Status: Adopted by MET/R WG
Who: Sub groups, ICAO APAC RO	

(ATFM/SG/15) WP/10 – CASE STUDY ON THE OPERATIONAL CAPACITY GUIDELINES LINKED TO WEATHER FORECASTS (Republic of Korea)

3.21. Republic of Korea presented the operational capacity guidelines for proactive ATFM at Incheon International Airport during snowfall during the MET/ATM Seminar session.

3.22. The meeting was informed of the necessity of ATFM Measures during snowfall and Republic of Korea's stage approach in setting up different level of operation capacity according to the severity of snow conditions.

3.23. The meeting acknowledged the use of CDM meetings to engage different stakeholders when operational constraints were anticipated, helping cultivate proactive responses.

3.24. The meeting appreciated the efforts of Republic of Korea and proposed a draft conclusion that the WP be added to the Regional ATFM Framework document as an appendix. [ATFM/SG/15 Draft conclusion].

3.25. The Secretariat will include the same in the next update of the Regional ATFM Framework document in 2027. The meeting also considered including the case study in the Regional Guidance for Tailored MET information and services to support ATM operations.

WP/07 – UPDATING THE IMPLEMENTATION EXAMPLE FROM THE REPUBLIC OF KOREA IN THE REGIONAL GUIDANCE FOR TAILORED METEOROLOGICAL INFORMATION AND SERVICES TO SUPPORT ATM OPERATION (Republic of Korea)

3.26. The Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations (MET-ATM Guidance) aims to enhance MET information and services for ATM in the region. States wishing to update their implementation cases in the MET-ATM Guidance must submit a working paper to the MET/R WG for discussion and adoption. The ad-hoc group consolidates changes and seeks approval from the MET SG.

3.27. WP/07 proposed including recent developments from the Republic of Korea in the MET-ATM Guidance. The implementation case for Korea was last updated in 2021, and new advancements in MET information and services have since emerged. The draft updated MET-ATM guidance implementation example from Korea, incorporating these developments, was presented in WP/07, Appendix A.

3.28. The meeting supported the proposal and adopted the following Decision:

Decision MET/R WG 14–04: Updating the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations (MET-ATM Guidance)	
What: That, the MET/R WG adopts the updated implementation example from the Republic of Korea (MET/R WG/14, WP/07, Appendix A) and requests that the MET/R WG ad-hoc group consolidate it in an update to the MET-ATM Guidance, Appendix 1, and obtain approval for publication from the MET SG.	Expected impact: Ops/Technical
Why: To enhance the MET-ATM Guidance with the latest developments	Follow-up:

from the Republic of Korea on MET information and services.	
When: MET SG/29	Status: Adopted by MET/R WG
Who: Sub groups, MET/R WG	

WP/10 – USE CASE OF MET INFORMATION SERVICES FOR ATFM IN SWIM DEMONSTRATION (Hong Kong, China)

3.29. Hong Kong, China, presented the MET information services use case for ATFM in the SWIM demonstration. The potential operational benefits for ATFM of sharing MET information and surveillance data through a SWIM demonstration conducted in May 2024 were presented.

3.30. In the demonstration held on May 29, 2024, the Hong Kong Civil Aviation Department (HKCAD), Hong Kong Observatory (HKO), Civil Aviation Authority of Singapore (CAAS), and Aeronautical Radio of Thailand (AEROTHAI) showcased the benefits of MET information sharing through SWIM to enhance ATFM.

3.31. The scenario involved HKO issuing a timely TAF in IWXXM format to HKCAD, allowing the automatic calculation of the Airport Acceptance Rate (AAR) at Hong Kong International Airport (VHHH) using advanced ATFM systems. HKO also provided hourly significant convection forecasts over the South China Sea, helping the Hong Kong ATFM Unit reduce AAR by 33% during severe weather.

3.32. The SWIM-enabled MET application integrated flight plan information in FIXM format, helping pilots plan for weather deviations, such as loading extra fuel. Updated MET information was provided via uplink, enabling safe deviations and rejoining flight paths. Shared Surveillance data (over SWIM) allowed for reassessment of weather impacts.

3.33. The demonstration highlighted SWIM's potential to enhance ATFM operations and decision-making by improving traffic demand and capacity forecasting, automatic landing slot calculations, and situational awareness for airlines and pilots. This efficient MET information exchange and surveillance data sharing could be used in future ATFM systems.

3.34. The meeting was invited to consider incorporating the use case into the reference document APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM.

3.35. The meeting supported the proposal and adopted the following decision:

Decision MET/R WG 14–05: Enhancing the *APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM* with an additional use case	
What: That, the MET/R WG adopts the use case of MET information services for ATFM in SWIM demonstration from MET/R WG/14, WP/10, for inclusion in future updates of the *APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM,* and requests the ad hoc group to consolidate the adopted changes and submit the proposed updates to MET SG for approval and publication on the ICAO APAC eDocument website.	Expected impact: ☐ Political / Global ☐ Inter-Regional ☐ Economic ☐ Environmental ☒ Ops/Technical
Why: To enhance the document with a new use case demonstrating potential operational benefits, supporting the development of SWIM-enabled MET applications to meet ATFM needs in the APAC Region.	Follow-up: ☐ Required from States
When: MET SG/29	Status: Adopted by MET/R WG

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

WP/12 – APAC USE CASES AND USER REQUIREMENTS FOR SWIM-BASED MET INFORMATION SERVICES SUPPORTING ATFM (MET/R WG Ad-hoc Group)

3.36. In May 2020, ICAO APAC MET/R WG/9 established an ad-hoc group to identify and document use cases and user requirements for SWIM-based MET information services supporting ATFM in the APAC Region. The group consists of experts from various countries and organisations. MET SG/24 reviewed and supported the proposal, adopting Decision MET SG/24-13 for developing SWIM-based MET services for ATFM.

3.37. In 2022, the ad hoc group presented an updated draft reference document and Terms of Reference at MET/R WG/11, including additional use cases on volcanic ash avoidance and fog diversion. MET/R WG/11 endorsed the updates. In April 2023, the MET/R WG Chair presented the updated draft at ATFM/SG/13, which agreed to contribute to enhancing SWIM-based MET service scenarios.

3.38. At MET/R WG/12, the group proposed two new use cases demonstrating the benefits of MET services for APAC ATFM operations. They also added a use case on Quantitative Volcanic Ash (QVA) concentration information in Trajectory-based Operations (TBO). The updates were presented at ATFM/SG/14 and MET/R WG/13.

3.39. The reference document aims to increase MET providers' and ATFM users' awareness of SWIM's operational benefits. MET SG/28 approved its publication as the *APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM* document on the ICAO APAC eDocument website and suggested sharing it with other ICAO Regional Offices. The document is intended to be a living reference, continuously updated with new use cases.

3.40. The meeting supported further editorial improvements to the document proposed by the ad hoc group in WP/12, Attachment A, and adopted the following Decision:

Decision MET/R WG 14–06: Updating the *APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM*	
What: That, the MET/R WG adopts the editorial improvements proposed by the ad hoc group (WP/12, Attachment A) for inclusion in future updates of the *APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM* and requests the ad hoc group to consolidate the adopted changes and seek endorsement from MET SG.	Expected impact: Ops/Technical
Why: To enhance the *APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM* with the latest editorial improvements proposed by the ad hoc group.	Follow-up:
When: MET SG/29	Status: Adopted by MET/R WG
Who: Sub groups, MET/R WG	

(ATFM/SG/15) IP/04 – INTEGRATION OF A-CDM INTO ATFM IN AUSTRALIA (Australia)

3.41. Australia shared its experience on how the A-CDM operations are integrated with ATFM measures through collaboration on MET assessment, capacity assessment, demand assessment, the Digital Twin, and a shift in mindset from “First come, first served” to the “Best planned, best served” concept.

IP/02 – MET AND ATS STAKEHOLDERS' COLLABORATION IN SOLOMON ISLANDS (Solomon Islands)

3.42. The Solomon Islands Meteorological Service (SIMS) supports civil air navigation's safety, regularity, and efficiency by providing timely and properly formatted METAR, TAF, and messages to the Solomon Islands Airport Corporation Limited (SIACL) ATS. SIMS issues METARs hourly and special reports (SPECIs) for significant phenomena. The TAF service operates 24/7 at key airports, replacing the Trend Forecast service (TTF) with updated "TAF3" forecasts every three hours.

3.43. SIMS and ATS have a Service Level Agreement based on ICAO Annex 3 and Solomon Islands Civil Aviation regulations. The agreement establishes a Quality Management System to ensure compliance and strengthen their partnership. The SLA outlines the responsibilities of both parties in obtaining and transmitting meteorological information, avoiding duplication and miscommunication. SIMS provides METAR, SPECI, TAF, Area QNH, and SIGMET products.

3.44. SIMS also signed a Memorandum of Understanding with Solomon Airlines to support their flight planning and operations. The Civil Aviation Authority of Solomon Islands has certified SIMS as the authorised service provider for aviation meteorological services. Annual stakeholder consultation meetings ensure ongoing collaboration, service improvement, and customer satisfaction.

3.45. The meeting noted the development of MET and ATM collaboration in the Solomon Islands. It was also informed that significant progress had been made towards rectifying the APANPIRG Air Navigation deficiency related to the provision of WAFC forecasts in the Solomon Islands. Therefore, the meeting requested the Secretariat, in coordination with the ad hoc group on air navigation deficiencies, to assist the Solomon Islands in preparing the appropriate report detailing the rectification of the deficiency (*Index No. AP-MET-20*) for further consideration at MET SG/29. **[ACTION MET/R WG/14-01].**

3.46. The meeting encouraged the Solomon Islands to present a Working Paper at the upcoming MET SG/29, highlighting the important initiative as a valuable example for other Pacific Island States. The paper could help showcase practical steps for enhancing MET and ATM collaboration in the region and inspire similar efforts in other Pacific Island States.

IP/08 – TRIAL OF PROBABILISTIC FORECAST (PROBnn) IN TAF (Hong Kong, China)

3.47. Hong Kong, China, presented the probabilistic forecast (PROBnn) trial in TAF. The trial was conducted by the Airport Meteorological Office (AMO) at the Hong Kong International Airport based on a requirement proposed by a commercial airline, providing more information and higher flexibility for flight planning.

3.48. The AMO at Hong Kong International Airport issues TAFs in line with ICAO Annex 3. Although probabilistic forecasts (PROBnn) are part of the standard terminology, they have rarely been used due to a preference for deterministic forecasts in Hong Kong. However, with the rise of model-based probabilistic forecasts and airlines' demand for better weather risk assessment, providing probabilistic information could enhance operational planning and flight safety.

3.49. In July 2021, a survey revealed mixed feedback on PROBnn, with 70% finding it unhelpful. To evaluate its benefits, AMO began a trial in January 2023, issuing additional PROBnn TAFs for thunderstorms to participating airlines. The trial, running until the end of 2024, aims to support ATM collaboration in risk assessment and optimise fuel planning.

3.50. Results showed that probabilistic TAFs had a higher success ratio for thunderstorm forecasts (31.4%) than deterministic forecasts (17.1%). The observed thunderstorm occurrence rate (30.9%)

closely matched the forecast probability. Forecast accuracy dropped significantly beyond the initial 9-hour period, highlighting the value of PROBnn in communicating forecast confidence.

3.51. The trial demonstrated that PROBnn enhances forecast capabilities and user confidence. AMO plans to expand the trial in 2025 before considering official implementation.

─End of Joint Session of MET/R WG/14 and ATFM/SG/15─

4. SIGMET coordination

WP/08 – WC SIGMET ISSUANCE EXPERIENCES AND PRACTICES IN THE OCEANIC SIGMET COORDINATION GROUP AND ITS LATEST DEVELOPMENT (Fiji, Hong Kong China, Indonesia, Papua New Guinea and Solomon Islands)

4.1. The meeting noted the latest developments of the Oceanic SIGMET Coordination group, which involves Fiji, Hong Kong, China, Indonesia, Papua New Guinea, and the Solomon Islands and covers five flight information regions (FIRs). It also noted that coordination between Indonesia and Papua New Guinea transitioned to operational status in August 2024.

4.2. The meeting noted the discussion of tropical cyclones and the issuance of relevant WC SIGMETs over the South Pacific Ocean, demonstrated through the example of TC Lola in October 2023. Relevant WC SIGMET issuance practices were collected within the coordination group and illustrated in the paper.

4.3. The meeting observed some differences in the WC SIGMET issuance practices across the APAC Region, including the practices in Australia as one of the neighbouring State, and requested the SIGMET coordination ad hoc group to collect user feedback on these practices. Based on the user feedback, the meeting further requested the ad hoc group to consider consolidating common practices on WC SIGMET issuance for developing potential guidelines on supplementing the APAC Regional SIGMET Guide.

4.4. The meeting adopted the following Decision:

<table>
<tr><td colspan="2">Decision MET/R WG 14–07: Consolidate user feedback on WC SIGMET issuance procedures for inclusion in APAC Regional SIGMET Guide</td></tr>
<tr><td>What: The ad-hoc group on SIGMET coordination collects and analyses user feedback on the differences in the WC SIGMET issuance practices across the Asia Pacific Region, and considers proposing regional guidelines for acceptable and harmonised TC SIGMET issuance procedures.</td><td>Expected impact:
☐ Political / Global
☐ Inter-Regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To support the development of harmonised regional guidelines for SIGMET issuance.</td><td>Follow-up: ☐ Required from States</td></tr>
<tr><td>When: MET/R WG/15</td><td>Status: Adopted by MET/R WG</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: MET/R WG</td></tr>
</table>

WP/13 – OUTCOMES OF CSI PROJECT ACTIVITIES (Cambodia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam)

4.5. The Collaborative SIGMET Issuance (CSI) project involves eight organizations from Southeast Asia coordinating to harmonize SIGMET issuance. Recent discussions focused on phenomena like clear

air turbulence, volcanic ash clouds, and turbulence from rapidly developing convective clouds. The importance of air reports (AIREPs) for SIGMET issuance was emphasized, and challenges in issuing SIGMETs for convective turbulence were identified. Solutions include using forecast SIGMETs and information that provides high-temporal and spatial resolution with frequent updates. The Japan Meteorological Agency shared practices for issuing forecast SIGMET. Myanmar and the Philippines have started or plan to start issuing forecast SIGMETs, while some MWOs continue with observation-based SIGMETs.

4.6. The discussion covered the minimum duration of WS SIGMET validity, with most CSI member MWOs agreeing on a common practice of 2 hours. Reference was made to the EUR Regional SIGMET and AIRMET Guide, which suggests a minimum horizontal extent of 100 km and duration of 30 minutes for hazardous phenomena. With reference to harmonized guidelines in the EUR Region, the ad-hoc group of the Regional SIGMET Guide recommends that the APAC Regional SIGMET Guide also include similar criteria suitable for the Region.

4.7. To ensure the adequate capture of APAC requirements, including those of relevant stakeholders, the meeting suggested that the ad hoc group undertake further work on this matter, especially collecting practices and user requirements from States in the Region to identify common criteria for WS SIGMET validity duration.

4.8. The meeting adopted the following Decision:

<table>
<tr><td colspan="2">Decision MET/R WG 14–08: Collecting States' practices and user requirements on the WS SIGMET validity duration</td></tr>
<tr><td>What: The ad-hoc group on SIGMET coordination collects and analyses the States' practices of the minimum duration of the validity period of WS SIGMET for TS, and consider further work to ensure that stakeholder requirements are adequately captured.</td><td>Expected impact:
☐ Political / Global
☐ Inter-Regional
☐ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: To support the development of harmonized regional guidelines for SIGMET issuance.</td><td>Follow-up: ☐ Required from States</td></tr>
<tr><td>When: MET/R WG/15</td><td>Status: Adopted by MET/R WG</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☐APAC States ☐ICAO APAC RO ☐ICAO HQ ☒Other: MET/R WG</td></tr>
</table>

IP/06 – UPDATES ON SIGMET COORDINATION ACTIVITIES SUPPORTED BY HKO (Hong Kong, China)

4.9. The meeting noted the latest updates on SIGMET coordination projects supported by the Hong Kong Observatory. These include the GHKPSV SIGMET Coordination project involving MWOs in the northern and northwestern parts of the South China Sea, the HMSU SIGMET Coordination group, the South and Southeastern Asia SIGMET Coordination project, and the Mekong SIGMET Coordination groups. The meeting was also informed of the major enhancements of the HKO Regional SIGMET Coordination platform supporting these projects.

4.10. The meeting noted HKO's plans to conduct trials for the Hazardous Weather Information Service (HWIS) from 2025 to 2027 and requested the Chair and Secretariat to arrange a presentation on HWIS developments under the MET Panel at the next MET SG or MET/R WG meeting. **[ACTION MET/R WG/14−02]**

IP/09 – DEVELOPMENT OF CB NOWCAST (Japan)

4.11. Since July 2015, the Japan Meteorological Agency has provided Himawari-8/9 derived Convective Cloud Information (CCI) for aviation safety and effective air traffic control. CCI includes rapidly developing cumulus areas (RDCA), cumulonimbus areas (CBA), and dense anvil cirrus areas (MLUA). The RDCA determination program is being localized in cooperation with meteorological agencies in Southeast Asia. To address the need for short-term CB forecasts, JMA developed the CB Nowcast, available on the SIGMET coordination platform since June 2023. CB Nowcast provides frequent updates on CB cloud movement and development, aiding SIGMET production and air traffic management. JMA collaborates with various aviation and meteorological entities to support safe flight operations.

5. Future work program and terms of reference

WP/05 – REVIEW MET/R WG TERMS OF REFERENCE AND WORK PLAN (Secretariat)

5.1. The MET/R WG operates under the MET SG of APANPIRG to support States in implementing meteorological services for ATM operations, enhancing safety, efficiency, and sustainability. The terms of reference and work plan outline the group's establishment, administrative arrangements, objectives, benefits, functions, membership, communication strategies, deliverables, and milestones. Regular reviews and updates are necessary to maintain the group's relevance and focus on ATM system requirements.

5.2. The meeting reviewed and proposed updates to the MET/R WG's terms of reference and work plan to ensure it continues to meet its objectives. **Appendix C** provides the latest terms of reference and work plan, including updates proposed by the meeting for consideration by MET SG.

6. Any other business

WP/09 – RUNWAY VISUAL RANGE (RVR) LOCATION (India)

6.1. India raised an issue concerning the installation and location challenges of Runway Visual Range (RVR) systems at Indian airports, particularly where RVR sensor placement conflicts with existing navigational aids like ILS, PAPI, and VASI. It sought clarification on the longitudinal and lateral placement of RVR sensors in such scenarios and requested that the meeting review the RVR site location practices.

6.2. The meeting was advised that, in addition to Annex 3, other ICAO guidance relevant to this issue included the Manual of Runway Visual Range Observing and Reporting Practices (Doc 9328).

6.3. Noting that the action proposed was outside the terms of reference of the MET/R WG, the meeting suggested that the Secretariat provide India with appropriate technical advice on applying relevant ICAO guidance.

7. Next Meeting

7.1. The meeting noted that the dates and location for the next meeting of the MET/R WG, including a MET/ATM Seminar, would be decided in conjunction with the ATFM/SG, and are tentatively scheduled in the first week of May 2026 in Bangkok, Thailand.

— END OF SECTION —

APPENDICES

APPENDIX A: LIST OF DRAFT CONCLUSIONS, DRAFT DECISIONS, AND DECISIONS

MET/R WG/14 – Draft Conclusion (DC) and Decisions (D)

No	Title of Decision	Text of Decision (What:)	Responsibility (Who:)	Target Date (When:)	Status/ Remarks
(1)	(2)	(3)	(4)	(5)	(6)
DC 14-01	**To include mapping of MET information needed to support APAC Seamless ANS Plan (ASAP) elements as an Appendix**	Publish the mapping document (MET/R WG/14, WP/06, Appendix B) as an appendix to the APAC Seamless ANS Plan (ASAP)	Secretariat	MET SG/29	
D 14-02	**Deliverable 2 of MET/R WG workplan as completed**	Consider Deliverable 2 (Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan) of the MET/R WG workplan as completed and closed. The ad-hoc group will be dissolved thereafter	MET/R WG	MET/R WG/14	
D 14-03	**Finalisation, Communication, and Future Planning for the Regional Survey on MET Services Supporting ATM**	(1) finalise and publish the refined 2021 survey report on MET services supporting ATM on the ICAO APAC eDocuments website; (2) develop a draft framework and concept note for a future regional survey for review at MET/R WG/15 and ATFM SG/16; and (3) support the ATFM SG in preparing a summary of the 2021 survey outcomes for presentation to ATM SG/13.	MET/R WG ad hoc group	(1) MET SG/29, (2) MET/R WG/15 and ATFM SG/16, (3) ATM SG/13	
D 14-04	**Updating the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations (MET-ATM Guidance)**	Adopt the updated implementation example from the Republic of Korea (MET/R WG/14, WP/07, Appendix A) and request that the MET/R WG ad-hoc group consolidate it in an update to the MET-ATM Guidance, Appendix 1, and obtain approval for publication from the MET SG	MET/R WG ad hoc group	MET SG/29	
D 14-05	**Enhancing the APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM with an additional use**	Adopt the use case of MET information services for ATFM in SWIM demonstration from MET/R WG/14, WP/10, for inclusion in future updates of the APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting	MET/R WG ad hoc group	MET SG/29	

No	Title of Decision	Text of Decision (What:)	Responsibility (Who:)	Target Date (When:)	Status/ Remarks
(1)	(2)	(3)	(4)	(5)	(6)
	case	ATFM, and request the ad hoc group to consolidate the adopted changes and submit the proposed updates to MET SG for approval and publication on the ICAO APAC eDocument website.			
D 14-06	**Updating the APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM**	Adopt the editorial improvements proposed by the ad hoc group (WP/12, Attachment A) for inclusion in future updates of the APAC Use Cases and User Requirements for SWIM-based Meteorological Information Services Supporting ATFM and request the ad hoc group to consolidate the adopted changes and seek endorsement from MET SG.	MET/R WG ad hoc group	MET SG/29	
D 14-07	**Consolidate user feedback on WC SIGMET issuance procedures for inclusion in APAC Regional SIGMET Guide**	Collect and analyse user feedback on the differences in the WC SIGMET issuance practices across the Asia Pacific Region,and consider proposing regional guidelines for acceptable and harmonised TC SIGMET issuance procedures.	Ad-hoc group on SIGMET coordination	MET/R WG/15	
D 14-08	**Collecting States' practices and user requirements on the WS SIGMET validity duration**	Collect and analyse the States' practices of the minimum duration of the validity period of WS SIGMET for TS and consider further work to ensure that stakeholder requirements are adequately captured.	Ad-hoc group on SIGMET coordination,	MET/R WG/15	

MET/R WG/13 – Decisions

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

Decision No	Title of Decision	Text of Decision (What:)	Responsibility (Who:)	Target Date (When:)	Status/ Remarks
(1)	(2)	(3)	(4)	(5)	(6)
13-01	**Guidance on the criteria for issuance of SIGMET for thunderstorms**	The ad hoc group on the SIGMET Guide is requested to enhance the guidance in the APAC Regional SIGMET Guide concerning coordinating SIGMET for thunderstorms.	Ad hoc group on the SIGMET Guide		**COMPLETED** [Ref: APAC Regional SIGMET Guide, Eleventh Edition, July 2025, App. K, 16.3-16.4 (https://www.icao.int/APAC/Pages/eDocs.aspx)]
13-02	**Updating the Regional Guidance for Tailored MET to support**	The ad hoc group on the Regional Guidance for Tailored MET to support ATM Operations is	Ad hoc group on the Regional Guidance for		**COMPLETED** [Ref: APAC Regional Guidance for Tailored MET

Decision No	Title of Decision	Text of Decision (What:)	Responsibility (Who:)	Target Date (When:)	Status/ Remarks
(1)	(2)	(3)	(4)	(5)	(6)
	ATM Operations	requested to include China's example in Appendix 1 of the updated guidance.	Tailored MET to support ATM Operations		Information and Services to support ATM Operations, Appendix 1 (https://www.icao.int/APAC/Documents/edocs/2024-07_APPENDIX-1(CHN).pdf)]
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.	Secretariat	MET SG/29	IN PROGRESS [Ref: Decision MET/R WG/14-03]
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.	Ad hoc group on the Survey of State MET Information Supporting ATM	MET SG/29	IN PROGRESS [Ref: Decision MET/R WG/14-03]
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.	The ad hoc group on APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM		**COMPLETED** [Ref: MET SG/28-WP/15; Decision MET SG/28-08; Action item MET SG/28-17; APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM, First Edition, July 2024 (https://www.icao.int/APAC/Pages/eDocs.aspx)]
13-06	**Mapping of 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.	Secretariat	MET SG/29	IN PROGRESS [Ref: Draft Conclusion MET/R WG/14-01]
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.	Ad hoc group on MET Information needed to support the Elements of the APAC Seamless ANS Plan		**COMPLETED** [Ref: MET/R WG/14, WP/06]

— END OF SECTION —

APPENDIX B: LIST OF ACTIONS

MET/R WG – List of Actions

New action items recorded by MET/R WG/14

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
MET/R WG/14 **01**	Assist the Solomon Islands in preparing the appropriate report detailing the rectification of the deficiency (Index No. AP-MET-20). [Ref: MET/R WG/14 Report, para. 3.45]	MET SG/29	Secretariat, in coordination with the ad hoc group on air navigation deficiencies	To begin
MET/R WG/14 **02**	Arrange for the presentation of an update on the MET Panel's HWIS developments. [Ref: MET/R WG/14 Report, para. 4.10]	MET SG/29 or MET/R WG/15	Secretariat and Chair	To begin

Action items recorded by MET/R WG/13

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

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	**COMPLETED** [Ref: T 4/3.2.7 - AP026/25 (MET), Att. A; MET/R WG/14-WP/01] ~~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	**COMPLETED** [Ref: MET/R WG/14-WP/05; MET/ATM Seminar presentation] ~~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	**COMPLETED** [Ref: APAC Regional SIGMET Guide, Eleventh Edition, July 2025, App. K, 16.3-16.4 (https://www.icao.int/APAC/Pages/eDocs.aspx)] ~~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	**COMPLETED** ~~To begin~~
MET/R WG/13 **05**	Consider improvements to the SIGMET Guide on using the WMO header when	MET/R WG/14	Ad hoc group on the SIGMET Guide	**COMPLETED** [Ref: APAC Regional SIGMET Guide, Eleventh Edition, July 2025,

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
	correcting a SIGMET. [Ref: MET/R WG/13 Report, 3.3.]			para. 3.5.1.4 (https://www.icao.int/APAC/Pages/eDocs.aspx)] ~~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 and ad hoc group on SIGMET coordination	**IN PROGRESS** ~~To begin~~ Ref: MET SG/28 WP/12, MET/R WG/14 WP/08, Decision MET/R WG/14-07
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	**COMPLETED** [Ref: APAC Regional SIGMET Guide, Eleventh Edition, July 2025, App. K, 16.3-16.4 (https://www.icao.int/APAC/Pages/eDocs.aspx)] ~~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	**COMPLETED**
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 SG/29 MET/R WG/14	Ad hoc group on SIGMET coordination in cooperation with the ad hoc group on the Regional SIGMET Guide	In progress ~~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	**COMPLETED** [Ref: APAC Regional Guidance for Tailored MET Information and Services to support ATM Operations, Appendix 1 (https://www.icao.int/APAC/Documents/edocs/2024-07_APPENDIX-1(CHN).pdf)] ~~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	**CLOSED:** Superseded by MET/R WG/13 Decision 13-03 ~~To begin~~

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
MET/R WG/13 **13**	Develop a proposal on the appropriate timing and content for conducting a future follow-up Survey of MET information supporting ATM. [Ref: MET/R WG/13 Report, 3.28.]	MET/R WG/14	Ad hoc group on the Survey of MET information supporting ATM	**CLOSED:** Superseded by MET/R WG/13 Decision 13-04 ~~To begin~~
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 (*APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM*) 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	**COMPLETED** [Ref: MET SG/28-WP/15; Decision MET SG/28-08; Action item MET SG/28-17; APAC Use Cases and User Requirements for SWIM-based MET Information Services Supporting ATFM, First Edition, July 2024 (https://www.icao.int/APAC/Pages/eDocs.aspx)] ~~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	**CLOSED:** Superseded by MET/R WG/13 Decision 13-06 ~~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	**COMPLETED** [Ref: MET/R WG/14, WP/06]
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	IN PROGRESS ~~To begin~~

Unresolved action items recorded by MET/R WG/11

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

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	MET/R WG/12	Chair and Secretariat	**COMPLETED** ~~In progress~~

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
	No. 5 timeframe, responsibility, and requirements details. [Ref: MET/R WG/11 Report, 5.2.] - Deliverable 2: *Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ANS Plan* - Deliverable 5: *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*			

— END OF SECTION —

APPENDIX C: TERMS OF REFERENCE AND WORK PROGRAM

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

Editorial note: Proposed updates show deleted text using strikeout (~~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[†]) 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: 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.

[†] 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]

MEMBERSHIP		
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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

WORK PLAN

DELIVERABLES
1. Documented analysis of MET information requirements (current and future) ~~used in~~ for 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~~ ANS Plan
3. ~~Draft~~ Further development of 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~~ DELIVERABLES	By date	Responsibility	Status
1. Deliverable 1: Documented analysis of MET information requirements (current and future) for the Region specifically to support ATM operations			
1.1. Identify follow-up actions (including presenting the survey results at ATM and Airspace Forums) (a) finalise and publish the refined 2021 survey report on MET services supporting ATM on the ICAO APAC eDocuments website; and (b) support ATFM SG in preparing a summary of the 2021 survey outcomes for presentation to ATM SG/13.	(a) MET SG/~~28~~29 (b) ATM SG/13.	Ad hoc Group: Rapporteur-Australia, Singapore, New Zealand, China, Japan, Thailand, Hong Kong China*, Viet Nam *Ira Chan, Christy Leung, John Chong	**In progress**
1.2. Formulate a proposal for the timing and content of a future survey develop a draft framework and concept note for a future regional survey for review at MET/R WG/15 and ATFM SG/16;	~~MET SG/28 ATM/SG/~~ MET/R WG/15 and ATFM SG/16	Ad hoc Group (as above) plus others identified in ATFM/SG/14 and MET/R WG/13	

~~MILESTONES~~ DELIVERABLES	By date	Responsibility	Status
2. Deliverable 2: Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ANS Plan			
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 *Ira Chan, Christy Leung, John Chong	**COMPLETED** ~~**In progress**~~
3. Deliverable 3: Further development of Regional guidance material for tailored MET information supporting ATM operations			
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~~	MET/R WG/14	MET/R WG members	**Completed** ~~**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~~15	Ad hoc group: Rapporteur-Japan, Australia, China, Hong Kong China*, Republic of Korea, Singapore, Thailand, Vietnam and IATA *Ira Chan (key coordinating person), Christy Leung, John Chong	**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		Ad hoc Group (as above)	**Completed** ~~**To begin**~~
3.4. Include the Republic of Korea's implementation example (MET/R WG/14, WP/07) in 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/14-04	MET SG/29	Ad hoc Group (as above)	**To begin**
4. Deliverable 4: Strengthen collaboration and relationship between MET, ATM and Airspace Users			
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	**Completed** ~~**To begin**~~
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	**Completed** ~~**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	**In progress** ~~**To begin**~~
4.4. Plan to conduct MET/R WG/15 in conjunction with ATFM/SG/16 to include a joint plenary component on matters of importance to both groups, including a Seminar on MET/ATM collaboration, taking into consideration feedback from the 2025 MET/ATM Seminar, including promoting and facilitating online participation in the Seminar.	MET/R WG/15 and ATFM/SG/16	Chair and Secretariat in coordination with ATFM/SG Chair	**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: i. The need to coordinate development of proposals for the ANP Volume III with the other APANPIRG Sub-Groups;	MET SG/~~27~~29	Ad-hoc group: Rapporteur-Secretariat, Australia, Hong Kong China*, IATA, Japan, Singapore, Thailand *Ira Chan, Christy Leung, John Chong	**To begin** **Pending outcomes of ICAO's development on the eANP system**

~~MILESTONES~~ DELIVERABLES	By date	Responsibility	Status
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			
6. Deliverable 6: Development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM			
6.1. 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*)	**Completed** **~~To begin~~**
6.2. Update the reference document to include the example from MET/R WG/14, WP/10, and submit the proposed updates to MET SG for consideration and approval for publication on the ICAO APAC eDocument website.	MET SG/29	Ad-hoc group (see below*) [Editorial note: to be updated]	**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~~29	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~~29	Secretariat and MET/R WG members	**To begin**
8. Meteorological Information for the Asia Pacific Regional Framework for Collaborative ATFM			
8.1. Provide input on seasonal meteorological information for the Regional Framework	TBC	MET/R WG members	**Pending advice from ATFM/SG [Obtain advice]**
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~~15	Ad hoc group on SIGMET Coordination: 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~~, Fatimah Syahirah, Syahirah Nik Adnan, Chai Mui Fatt) - Thailand (Rassmee Damrongkietwattana) - Vietnam (Le Quang Hung, Vu Thi Thanh Tam)	**ONGOING**
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: • 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) COMPLETED • Seek user feedback on TC SIGMET handover procedures (MET/R WG/14, WP/08) • 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. • Collect and analyze the States' practices of minimum duration of the validity period of WS SIGMET for TS (MET/R WG/14, WP/13)	MET/R WG/~~14~~15		**In progress**
9.3. Propose the SIGMET coordination guidance in the Regional SIGMET Guide following findings from below ~~9.2~~ The following points to consider: • 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		**Completed**
9.4. Review, organise and support surveys on user requirements of SIGMET coordination	MET/R WG/~~14~~15		**In progress**

***Ad-hoc group for Deliverable 6: Development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM**			
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— END OF SECTION —

APPENDIX D: LIST OF PAPERS AND PRESENTATIONS

WORKING PAPERS – MET/R WG/14			
WP No.	**Agenda Item**	**Title**	**Presented by**
WP/01	1	Provisional Agenda	Secretariat
WP/02	2	Follow-up Action from MET/R WG/12	Secretariat
WP/03	2	Follow-up Action from MET SG/27	Secretariat
WP/04	2	Follow-up Action from APANPIRG/34	Secretariat
WP/05	3	Review MET/R WG Terms of Reference and Work Plan	Secretariat
WP/06	3	Met Information Needed to Support the Elements of the APAC Seamless ANS Plan	Met/R WG Ad-Hoc Group
WP/07	3	Updating the Implementation Example from the Republic of Korea in the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operation	Republic of Korea
WP/08	3	WC SIGMET Issuance Experiences and Practices in the Oceanic SIGMET Coordination Group and Its Latest Development	Fiji, Hong Kong China, Indonesia, Papua New Guinea, and Solomon Islands
WP/09	3	Runway Visual Range (RVR) Location	India
WP/10	3	Use Case of Met Information Services for ATFM in SWIM Demonstration	Hong Kong, China
WP/11	3	Follow-Up on the Survey of State MET Information Supporting ATM and Development of Future Activities	MET/R WG ad hoc group
WP/12	3	APAC Use Cases and User Requirements for SWIM-Based MET Information Services Supporting ATFM	MET/R WG Ad-hoc Group
WP/13	4	Outcomes of CSI Project Activities	Cambodia, Japan, Lao PDR, Malaysia, Myanmar, Philippines, Thailand, and Vietnam

INFORMATION PAPERS – MET/R WG/14			
IP No.	**Agenda Item**	**Title**	**Presented by**
IP/01	1	Meeting Bulletin	Secretariat
IP/02	3	MET and ATS Stakeholders' Collaboration in Solomon Islands	Solomon Islands

INFORMATION PAPERS – MET/R WG/14			
IP No.	**Agenda Item**	**Title**	**Presented by**
IP/03	3	The Development of User-Centric Engagement Strategies and Fit-For-Purpose Products in South-West China	China
IP/04	3	Temporal And Spatial Characteristics of Aircraft Turbulence on the Slope of Qinghai-Tibet Plateau and Turbulence Forecasting System Based on EDR	China
IP/05	3	En-Route Turbulence Detection Using ADS-B Data	Hong Kong, China
IP/06	3	Updates on SIGMET Coordination Activities Supported by HKO	Hong Kong, China
IP/07	3	Probabilistic Forecast of Runway Headwind Changes at the Hong Kong International Airport for Supporting ATM Operations	Hong Kong, China
IP/08	3	Trial of Probabilistic Forecast (PROBNN) in TAF	Hong Kong, China
IP/09	4	Development of CB Nowcast	Japan

PRESENTATIONS – MET/ATM SEMINAR		
SP No.	**Title**	**Presented by**
SP/01	15 Years of Progress - Can We Do Better?	IFATCA
SP/02	ATM and ATFM requirements for MET information	ICAO
SP/03	Updates on ICAO MET information services development	Chair MET/R WG and ICAO
SP/04	Impact-based MET information to support ATM operation	Japan
SP/05	Airport Collaborative Decision-Making (A-CDM)	Australia
SP/06	Case study: Probabilistic forecast of runway headwind changes for supporting estimation of Airport Acceptance Rate	Hong Kong, China
SP/07	Case study: MET information being used for ATFM	Republic of Korea
SP/08	Case study: Use of Meteorology Information in Bangkok ATFMU	Thailand
SP/09	Case study: The development of user-centric engagement strategies and fit-for-purpose products in south-west China	China
SP/10	Importance of special air reports	Chair MET/R WG and ICAO
SP/11	Turbulence Aware - Facilitating industry shift to data-driven turbulence mitigation	IATA

PRESENTATIONS – MET/ATM SEMINAR		
SP No.	**Title**	**Presented by**
SP/12	Case study: En-route turbulence detection using ADS-B data and special air reports	Hong Kong, China
SP/13	Temporal and Spatial Characteristics of Aircraft Turbulence on Qinghai-Tibet Plateau Slope and Turbulence Forecasting based on EDR	China

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