

**INTERNATIONAL CIVIL AVIATION ORGANIZATION
ASIA AND PACIFIC OFFICE**



**REPORT OF THE
TWENTY-SIXTH MEETING OF THE ASIA/PACIFIC METEOROLOGY SUB-GROUP
(MET SG/26)**

Online, 1-5 August 2022

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The views expressed in this Report should be taken as those of the Meeting and not the Organization.

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HISTORY OF THE MEETING

1. Introduction

1.1. The ICAO Asia and Pacific (APAC) Office hosted the Twenty-Sixth Meeting of the Meteorology Sub-group (MET SG/26) of the APAC Air Navigation Planning and Implementation Regional Group (APANPIRG) online from 1 to 5 August 2022.

2. Attendance

2.1. One-hundred and thirteen (113) participants from twenty-four (24) States and Special Administrative Regions and three (3) International Organisations registered to participate in the Meeting. The list of registered participants is provided in **Appendix A** of this Report.

3. Chair and Secretariat

3.1. Mr Pak-wai Chan presided over the Meeting in the role of Chairperson, assisted by Ms Nguyen Lan Oanh in the role of Vice-Chairperson. Mr Peter Dunda, ICAO Regional Officer, Aeronautical Meteorology and Environment, acted as Secretary of the Meeting.

4. Organisation and language of the Meeting

4.1. The Meeting convened as a single body for discussion on the agenda items. The working language was English, including all documentation. The Meeting considered twenty (20) Working Papers (WPs) and eleven (11) Information Papers (IPs). The list of papers is in **Appendix B** of this Report.

5. Draft Conclusions, Conclusions, Draft Decisions and Decisions

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

- a) **Draft Conclusions** (formulated by the Sub-group for further consideration by APANPIRG) deal with matters involving economic, environmental or political aspects or global implications that, according to the APANPIRG terms of reference, will not be dealt with by the Sub-group but require the attention of States, or action by the ICAO, following established APANPIRG procedures;
- b) **Conclusions** (adopted by the Sub-group) deal with matters of a technical nature and regional applicability that, according to the Sub-group's terms of reference, require the attention of States, or action by the ICAO, following established APANPIRG procedures; and
- c) **Draft Decisions** (formulated by the Sub-group for further consideration by APANPIRG) deal with matters of concern only to the APANPIRG and its contributory bodies;
- d) **Decisions** (adopted by the Sub-group) relate solely to matters dealing with the internal working arrangements of the Sub-group.

5.2. The Meeting formulated the following **two (2) Draft Conclusions**, adopted the following **one (1) Conclusion**, formulated no **Draft Decisions**, and adopted the following **two (2) Decisions**:

Draft Conclusions

Draft Conclusion MET SG/26/03 – WAFS, SADIS and WIFS upgrades	
<p>What: That, users of WAFS, SADIS and WIFS are invited to:</p> <p>a) familiarise themselves with the proposed WAFS data and technical changes planned for November 2023 and 2024;</p> <p>b) discuss the upcoming changes with their technical departments and make plans for how their organisation could adapt to these technological changes;</p> <p>c) get involved in trying out the new test/beta application programming interfaces (APIs) once they become available in late 2022 or 2023.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-Regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: WAFS, SADIS and WIFS users will have to adapt their systems to benefit from the planned WAFS upgrades, which correspond with proposed Amendments 81 to ICAO Annex 3.</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: by November 2023 and 2024</p>	<p>Status: Draft to be adopted by APANPIRG</p>
<p>Who: <input type="checkbox"/> Sub Groups <input type="checkbox"/> RASG-APAC <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ</p> <p> <input type="checkbox"/> Other:</p>	

Draft Conclusion MET SG/26/04 – 0.25-degree WAFS hazard data	
<p>What: That, users of WAFS, SADIS and WIFS are urged to, if not already done so, integrate the 0.25-degree WAFS hazard data (for cumulonimbus, icing and turbulence) into their systems and software before November 2023.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-Regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: The WAFCs have introduced 0.25-degree WAFS hazard data and will discontinue providing users with the 1.25-degree hazard data sets in November 2023. The previous Conclusion APANPIRG/31/17: <i>0.25-degree WAFS hazard data</i>, and associated ICAO State letter Ref.: T 4/8.2 – AP129/21 (MET), dated 15 July 2021, also requested SADIS user States to make the necessary systems changes to integrate the new 0.25-degree WAFS hazard data into their SADIS user systems and software.</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: by November 2023</p>	<p>Status: Draft to be adopted by APANPIRG</p>
<p>Who: <input type="checkbox"/> Sub Groups <input type="checkbox"/> RASG-APAC <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ</p> <p> <input type="checkbox"/> Other:</p>	

Conclusion

Conclusion MET SG/26/05 – Encourage States to provide input on the online repository on SIGMET Coordination and the consolidation document on SIGMET Coordination Practices in the APAC region	
<p>What: That,</p> <p>a) States be invited to provide updates to the online repository on SIGMET Coordination and supplement its local SIGMET issuance practices to the consolidation document on SIGMET Coordination practices in the APAC region (using the contact details provided in</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p>

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the documents); and b) The ICAO Asia/Pacific Regional Office will notify the States/Administrations of the availability and location of the above documents and invite States' inputs to the consolidation document by issuing a State Letter.	<input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To enhance the SIGMET coordination in the Region by gathering lessons learnt from existing SIGMET coordination activities to facilitate more efficient and better coordinated SIGMET service to meet aviation users' expectations and operational requirements in the Region.	Follow-up: <input type="checkbox"/> Required from States
When: Now	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: ROs	

Decisions

Decision MET SG/26/01 – Updates to Regional SIGMET Guide	
What: That, the MET SG approves the updates to the SIGMET Guide as presented in Appendix A of WP/09 for use by States and publishing on the ICAO APAC Office website.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-Regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: to make the latest updates to the SIGMET Guide available for use by the States	Follow-up: <input type="checkbox"/> Required from States
When: Now	Status: Adopted by MET SG
Who: <input type="checkbox"/> Sub Groups <input type="checkbox"/> RASG-APAC <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

Decision MET SG/26/02 – Update the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations	
What: That, the MET SG approves the proposed updates to the <i>Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations</i> .	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To provide States with up-to-date guidance material and make the updated version available on the ICAO APAC eDocuments website	Follow-up: <input type="checkbox"/> Required from States
When: As soon as practicable	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

6. List of Draft Conclusions, Conclusions, Draft Decisions and Decisions

Decision MET SG/26/01 – Updates to Regional SIGMET Guide

Decision MET SG/26/02 – Update the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations

Draft Conclusion MET SG/26/03 – *WAFS, SADIS and WIFS upgrades*

Draft Conclusion MET SG/26/04 – *0.25-degree WAFS hazard data*

Conclusion MET SG/26/05 – *Encourage States to provide input on the online repository on SIGMET Coordination and the consolidation document on SIGMET Coordination Practices in the APAC region*

7. List of Actions

7.1. In addition, the Meeting agreed to nine (9) actions, as indicated within the Report on Agenda Items and reproduced in the MET SG List of Actions in **Appendix C** of this Report.

REPORT ON AGENDA ITEMS

1. Organisational Matters

Opening of the Meeting

1.1. The Secretary, Mr Peter Dunda, and the Chairperson, Mr Pak-wai Chan, opened the Meeting and welcomed all participants on behalf of the ICAO APAC Regional Director, Mr Tao Ma.

1.2. The start of the Meeting was delayed for two hours to facilitate accessibility to meeting documentation impacted by an ICAO system-wide Internet outage that occurred before the Meeting.

WP/01 – Adoption of the agenda (Secretariat)

1.3. The Meeting adopted the agenda (which was circulated with the invitation) as follows:

Agenda Item 1: Organisational matters

Agenda Item 2: Review outcomes from previous meetings

Agenda Item 3: Air navigation deficiencies

Agenda Item 4: Regional guidance material

Agenda Item 5: Planning and monitoring

Agenda Item 6: Research, development and other initiatives

Agenda Item 7: Future work program

Agenda Item 8: Any other business

1.4. The Meeting noted that papers WP/17, WP/19 and WP/20, submitted by the States for discussion under Agenda Item 3 on air navigation deficiencies, were not available to the participants before the Meeting (due to the issue discussed in 1.2.) and, therefore, considered delaying discussion on those papers (to later in the Meeting).

1.5. However, the Secretariat anticipated discussion on Agenda Item 3 would not commence before the second session of the second day. Therefore, the Meeting agreed to proceed in the above order of discussion.

WP/02 – Review the Terms of Reference (Secretariat)

1.6. The Secretariat presented the MET SG terms of reference, which included the MET SG's objectives, functions, establishment, membership, Chairing and Secretary, meetings, reporting, delegated authority and the plan of work for review and possible updates by the Meeting.

1.7. The Meeting reviewed the terms of reference but did not propose further updates. A copy of the MET SG terms of reference is provided in **Appendix D** of this Report.

2. Review Outcomes from previous Meetings

WP/03 – Review Outcomes from MET SG/25 (Secretariat)

2.1. The Secretariat presented updates on outcomes from the Twenty-Fifth Meeting of the Meteorology Sub-group (MET SG/25), which included three (3) Draft Conclusions and one (1) Draft

Decision (for further consideration by APANPIRG), three (3) Conclusions and four (4) Decisions dealing with matters under the MET SG's terms of reference, and fifteen (15) action items.

2.2. The Secretariat informed the Meeting that APANPIRG/32 had considered the Draft Conclusions and Draft Decision formulated by MET SG/25, and further details would be discussed in WP/04.

2.3. The Secretariat informed the Meeting that in response to Conclusion MET SG/25-01: *Publishing of IWXXM Frequently Asked Questions*, Conclusion MET SG/25-10: *Update to Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations*, and Conclusion MET SG/25-11: *Updates to Regional SIGMET Guide*, the Secretariat had published the guidance material as requested on the ICAO APAC Office eDocuments¹ webpage.

2.4. The Secretariat also informed the Meeting that the guidance material endorsed by MET SG/25 in Decision MET SG/25-05: *MET Deficiencies template and guidance* was published on the ICAO APAC Office website as Appendix F of the Report of MET SG/25. However, the Meeting considered that publishing the MET Deficiencies template and guidance documents as stand-alone documents would better facilitate their use by the States. Therefore, the Meeting requested the Secretariat publish the MET Deficiencies template and guidance documents, once finalised, as stand-alone documents on the ICAO APAC Office eDocuments webpage. **[ACTION 26/01]**

2.5. The Secretariat also informed the Meeting that follow-up action was ongoing in response to the remaining MET SG/25 Decisions. In response to Decision MET SG/25-02: *Review the consistency in terminology and reporting format of the working groups*, the Secretariat and Chairs of MET SG and WGs were coordinating the preparation of a standard, integrated reporting template. In response to Decision MET SG/25-04: *MET Deficiencies ad hoc group TOR*, the designated ad hoc group adopted the terms of reference. Finally, in response to Decision MET SG/25-06: *Further update on SIGMET Coordination guidance for enhancement of SIGMET coordination activities in the Region*, the designated ad hoc group on SIGMET Coordination (under MET/S WG) was following the detailed steps in Decision MET SG/25-06.

2.6. The Meeting appreciated the updates provided by the Secretariat. Still, it noted that several MET SG/25 action items had target dates that had already passed, and the status of the actions was “in progress” or “to commence”. Therefore, to ensure progress on the action items, the Secretariat advised the Meeting that the action items would remain in the List of Actions until the follow-up action was completed. Furthermore, the Meeting noted that the Secretariat and the Chairs of MET SG and the MET WGs would continue to coordinate monitoring, progress follow-up action, and update the List of Actions.

WP/04 – Review of APANPIRG/32 (Secretariat)

2.7. The Secretariat presented updates on relevant outcomes from the Thirty-Second Meeting of the Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/32), which included three (3) Conclusions for the attention of States or actions by ICAO and one (1) Decision for APANPIRG and its contributory bodies.

2.8. The Secretariat informed the Meeting that APANPIRG/32 adopted two Conclusions and one Decision based on two of the three Draft Conclusions and one Draft Decision formulated by MET SG/25. Furthermore, as a follow-up to the above Conclusions and Decision, the Secretariat issued

¹ <https://www.icao.int/APAC/Pages/eDocs.aspx> (click on the MET tab)

the following State letters requesting the States to take appropriate action:

- Ref.: AN3/3 – AP101/22 (MET), 26 July 2022; on Conclusion APANPIRG/32/11: *Updating Online Register of IWXXM Exchange Status* (based on MET SG/25 Draft Conclusion MET SG/25-03)
- Ref.: T4/3.2.9 – AP070/22 (MET), 9 May 2022; on Decision APANPIRG/32/12: *Meteorological expert contribution to SWIM/TF* (based on Draft Decision MET SG/25-08)
- Ref.: AN3/3 – AP102/22 (MET), 26 July 2022; on Conclusion APANPIRG/32/13: *Update on the provision of Space Weather Advisory* (Based on Draft Conclusion MET SG/25-09)
- Ref.: AN3/3 – AP015/22 (AGA), 19 January 2022; on Conclusion APANPIRG/32/14: *Update of Information in APANPIRG Air Navigation Deficiencies Reporting Form*.

2.9. The Secretariat informed the Meeting that APANPIRG/32 had considered but did not adopt the Draft Conclusion MET SG/25-07: *SWIM architecture to enable the cost-effective and efficient provision and consumption of MET information services*. Instead, APANPIRG/32 noted that the Draft Conclusion would be captured in the ongoing review of SWIM/TF terms of reference and concluded that there was no need to consider further Draft Conclusion MET SG/25-07.

2.10. The Meeting noted that Australia and the Chair and Vice-chair of MET SG were disappointed with how APANPIRG/32 handled the discussion on Draft Conclusion MET SG/25-07, as discussed above, which the Meeting noted was inconsistent with expectations.

2.11. The Secretariat informed the Meeting that, in response to concerns raised by MET SG/25, the Secretariat had informed APANPIRG/32 that the Secretariat is considering the possibility of advertising for the secondment of an Aviation Meteorology subject matter expert to supplement the Secretariat support for the APANPIRG MET-related work.

2.12. The Meeting welcomed the possibility of additional Secretariat resources to support the MET SG work program.

WP/05 – Review outcomes from MET/IE WG/20 (Chair MET/IE WG)

2.13. The Chair of MET/IE WG presented outcomes from the 20th Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/20), including a conjoint session with the 12th Meeting of the Meteorological Services Working Group (MET/S WG/12), held online from 28 – 30 March 2022. The outcomes included an updated action list, revised terms of reference and work plan of the MET/IE WG, as detailed in WP/05.

2.14. The Meeting appreciated the outcomes presented by the Chair of MET/IE WG and the progress made by the MET/IE WG.

WP/06 – Review outcomes from MET/S WG/12 (Chair MET/S WG)

2.15. The Chair of MET/S WG presented outcomes of the 12th Meeting of the Meteorological Services Working Group (MET/S WG/12), held online from 30 March – 1 April 2022. The outcomes included developments in SIGMET coordination among the States in the Region and activities supporting identifying and resolving air navigation deficiencies in meteorological services, as detailed in WP/06.

2.16. The Chair of MET/S WG highlighted the progress made by States in harmonising

SIGMET through several SIGMET coordination activities in the Region. It noted that the designated ad hoc group under MET/S WG had developed an online repository for the information on SIGMET coordination activities and a document titled *Consolidation of SIGMET Coordination Practices in the APAC Region*. This work supports states in expanding and integrating their SIGMET coordination activities. In addition, to further support the coordination of SIGMET, MET/S WG formulated a Draft Conclusion for consideration by the (MET SG/26) Meeting – which would be discussed further in WP/15.

2.17. The Meeting appreciated the outcomes presented by the Chair of MET/S WG and the progress made by the MET/S WG.

2.18. The Meeting noted that MET/S WG/12 did not discuss any papers under its agenda item on the quality management systems (QMS) of meteorological services. It, therefore, suggested that MET/S WG request papers on issues concerning the implementation of QMS by the States and monitoring the implementation of QMS in the Region for future meetings [**ACTION 26/02**]. The Meeting was pleased to be informed by Solomon Islands that some Pacific Island States may present a paper on QMS at an upcoming ICAO APAC MET WG or SG meeting.

2.19. In response to a question from Nepal concerning participation in SIGMET coordination activities, the Meeting recommended interested States could contact the MWOs of neighbouring States to initiate the coordination and seek assistance from the MET/S WG ad hoc group on SIGMET coordination.

2.20. The Meeting was reminded that the VOLCEX/SG/07 meeting was conducted in December 2021, but a new Chairperson for the VOLCEX/SG was not selected, and the Report of VOLCEX/SG/07 was not yet available. The Secretariat informed the Meeting that the report of VOLCEX/SG/07 was not yet published, but it would be ready to share with the VOLCEX/SG soon and then be distributed more widely to the States.

WP/07 – Review of the MET/R WG/11 (Chair MET/R WG)

2.21. The Chair of MET/R WG presented outcomes of the Meteorology/Air Traffic Management (MET/ATM) Webinar and the Eleventh Meeting of the Meteorological Requirements Working Group (MET/R WG/11), held online from 30 May – 3 June 2022, including agreed actions and work plan of the MET/R WG, as detailed in WP/07.

2.22. The Chair of MET/R WG highlighted progress by the designated ad hoc group on its proposal to improve and expand the document, *APAC Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations*, to provide further support to States on post-operational analysis of the impact of tailored MET information on ATM decisions.

2.23. Furthermore, MET/R WG/11 had formulated a Draft Decision for consideration by the (MET SG/26) Meeting to approve the proposed updates to the above guidance – which would be discussed further in WP/10.

2.24. The Meeting appreciated the outcomes presented by the Chair of MET/R WG and the progress made by the MET/R WG.

2.25. WMO observed that the ICAO APAC Region was far more advanced than some other Regions in promoting and stimulating MET and ATM engagement and that, conceivably, some regional initiatives may filter upwards to become globally-applicable international standards over time.

WP/18 – SWIM Architecture Support for MET Information Services (MET experts in SWIM)

TF)

2.26. MET experts in SWIM TF provided an update on the outcomes of discussions on SWIM architecture for the efficient provision of MET information services in relevant meetings since MET SG/25, as detailed in WP/18. The discussions occurred in APANPIRG/32 (as discussed in WP/04) and SWIM TF/6.

2.27. Outcomes from SWIM TF/6 included the formulation of Draft Decision SWIM TF/06/01 - *The Use of the Internet for MET Information Services in Regional SWIM architecture* for further consideration and possible adoption by the upcoming CNS SG/26. It proposes that the SWIM TF consider using the Internet for meteorological information services when designing the regional SWIM architecture.

2.28. In addition, the SWIM TF requested member states to nominate MET experts to contribute and participate in various tasks of SWIM TF. The Meeting welcomed this development since the involvement of MET experts in the activities of the SWIM TF could help overcome some prevailing concerns or misunderstandings on how MET information will be made available and used in a SWIM environment.

2.29. SWIM TF/6 also formulated Draft Decision SWIMTF/06/07 – *Revised SWIM TF Terms of Reference* for further consideration and possible adoption by the upcoming CNS SG/26, which would include “other IP-based networks” in addition to the CRV for the APAC Regional SWIM architecture.

2.30. SWIM TF/6 also requested the CRV Operations Group (CRV OG) to decide on an appropriate name for CRV users and subscribers other than ANSPs, noting concerns about documenting MET service providers as “non-aviation” service providers.

2.31. The Meeting appreciated the MET experts’ efforts and the updates provided. Noting the importance of Draft Decision SWIM TF/06/01, the Meeting requested the Secretariat to submit a paper to CNS SG/26 highlighting that the MET SG/26 noted the importance of CNS SG/26 adopting the proposal in Draft Decision SWIM TF/06/01. **[ACTION 26/03]**

3. Air navigation deficiencies

WP/08 – Review APANPIRG Air Navigation Deficiencies (Secretariat)

3.1. The Secretariat presented the list of APANPIRG air navigation deficiencies in meteorology (MET), including the associated corrective action plans (CAPs) to rectify the deficiencies. The MET deficiencies in the Open List were related to facilities and services in seven (7) APAC States, as summarised in **Table 1** below:

Table 1: Summary of APANPIRG air navigation deficiencies in the MET field

MET facilities and services	APAC States	Def. ID	Status
Aerodrome meteorological observations or reports	Kiribati	AP-MET-02	open
	Nauru	AP-MET-21	open
Meteorological watch office (MWO) or SIGMET information	Democratic People’s Republic of Korea	AP-MET-16	open
	Nauru	AP-MET-24	open
	Nepal	AP-MET-14	open
	Papua New Guinea	AP-MET-08	open
	Papua New Guinea	AP-MET-22	open
	Solomon Islands	AP-MET-23	open

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Volcanic ash/activity information	Papua New Guinea	AP-MET-04	open
	Tonga	AP-MET-17	open
WAFS forecasts or flight briefings	Kiribati	AP-MET-18	open
	Nauru	AP-MET-19	open
	Solomon Islands	AP-MET-20	open

3.2. The Meeting noted that resolving deficiencies related to WAFS forecasts was challenging for States if the requirements for providing WAFS forecasts were not fully understood. Therefore the Meeting requested the Secretariat to provide technical assistance to help the States concerned determine the requirements for WAFS forecasts. **[ACTION 26/04]**

WP/17 – Update on MET Deficiency AP-MET-23 (Solomon Islands)

3.3. Solomon Islands provided the Meeting with an outline of the work done to rectify APANPIRG air navigation deficiency AP-MET-23 (which concerns the lack of SIGMET issued for the Honiara FIR). The work followed the corrective action agreed by MET SG/25 (in Action No. 25/10) on the content, format and timeliness of SIGMET for possible consideration by the MET SG to support the removal of deficiency AP-MET-23 from the APANPIRG list.

3.4. WP/17 highlighted Solomon Island’s achievements towards rectifying the above deficiency. Achievements presented by Solomon Islands included (a) participation in SIGMET tests, (b) conducting refresher training for Air Traffic Services and MET personnel with invited overseas experts, (c) participation in a Volcanic Ash Exercise, and (d) collaboration with neighbouring States on SIGMET Coordination and (e) logging of SIGMET issued with its partner States in March to April 2022.

3.5. The Meeting congratulated Solomon Islands and its partner States on the significant progress made towards rectifying the deficiency and noted that Solomon Islands planned to conduct further monitoring of its SIGMET messages as necessary for an appropriate duration to validate the improvements to its SIGMET service. In addition, to improve the timeliness of SIGMETs, Australia is trialling a solution to route the Solomon Islands’ SIGMETs to the AFTN automatically. Given the above, the Meeting noted that Solomon Islands might soon be in a position to report that the deficiency has been rectified.

3.6. The Secretariat informed the Meeting that Solomon Islands can submit an official report to ICAO providing complete details of the action taken when Solomon Islands has validated that the deficiency has been rectified without waiting for the next MET SG meeting. ICAO would then inform APANPIRG that the deficiency can be removed from the Open List.

WP/19 – Resolution of MET Deficiency AP-MET-04 (Papua New Guinea)

3.7. On behalf of Papua New Guinea (PNG), the Rapporteur of the MET/S WG ad hoc group presented a summary of the corrective action taken by PNG to rectify the APANPIRG air navigation deficiency AP-MET-04 (which concerns information on volcanic activity not provided regularly to ATS units, MWOs and VAACs). In addition, PNG’s paper requested further advice from the MET SG on additional action required to rectify the deficiency.

3.8. WP/19 highlighted PNG’s achievements in rectifying the above deficiency. Achievements presented by PNG included (a) establishing a liaison between those concerned with the supply (i.e., the designated State volcano observatory: Rabaul Volcanological Observatory (RVO)) and those concerned with the use of the information on volcanic activity, (b) establishing a process for providing the information on volcanic activity regularly to the relevant ATS unit and MWO in PNG

and VAAC Darwin, and (c) preparing, supplying and disseminating SIGMET information by MWO Port Moresby based on the information on volcanic activity provided by the RVO.

3.9. WP/19 also indicated that PNG was seeking (and would provide when available) confirmation from the relevant ATS unit, MWO and VAAC of the regular, timely receipt of the information on volcanic activity from the RVO as further evidence validating that the deficiency has been rectified. However, a representative of PNG National Weather Service informed the Meeting that receipt of the information on volcanic activity from the RVO was not regular, and the Meeting noted that the example email from RVO provided in WP/19 was not addressed to the PNG National Weather Service.

3.10. Furthermore, the Meeting noted that PNG had not yet established a formal agreement, including procedures, for the RVO to provide information on volcanic activity to the ATS unit, MWO and VAAC. The Meeting also noted that the Civil Aviation Safety Authority (CASA) of PNG, in discussions with the RVO on the way forward, identified the establishment of procedures as an action to ensure the regular provision of information on volcanic activity to support air navigation safety in PNG.

3.11. Given the above, the Meeting recommended that, in addition to the validation discussed in para. 3.8., PNG should provide evidence of the procedures established, as discussed in para. 3.9. to support ICAO with validating that the deficiency has been rectified. PNG can then submit an official report to ICAO providing complete details of the action taken. Finally, ICAO would inform APANPIRG that the deficiency can be removed from the Open List.

WP/20 – Resolution of AP-MET-17 – Information on Volcanic Activity (Tonga)

3.12. On behalf of Tonga, the Rapporteur of the MET/S WG ad hoc group presented an outline of work done by Tonga, with assistance from the Pacific Island Aviation Weather Services (PIAWS) Panel, to rectify the APANPIRG air navigation deficiency AP-MET-17 (which concerns information on volcanic activity not provided regularly to ATS units, MWOs and VAACs). In addition, Tonga's paper requested the MET SG to consider formulating a Draft Conclusion to remove the deficiency from the Open List. Tonga also requested the Secretariat to progress the previously agreed proposal to amend the ANP, Volume I, Table MET I-1 – *State Volcano Observatories* to include the Tonga Geological Service as the designated State Volcano Observatory by Tonga.

3.13. The Meeting noted Tonga's progress towards rectifying the above deficiency, as evidenced by the outcomes of a series of volcanic ash exercises arranged by VAAC Wellington from June to August 2020 and the ICAO APAC VOLCEX 20/02¹ volcanic ash exercise in July 2020.

3.14. The Meeting noted that, in the above exercises, the Tonga Geological Service, in collaboration with Tonga Meteorological Service, demonstrated the provision of information on volcanic activity, in the format of the Volcano Observatory Notice to Aviation (VONA), regularly to the relevant ATS unit in Tonga and MWO and VAAC in Wellington.

3.15. In addition, the Meeting noted that during the subsequent violent and devastating eruptions of the Hunga Tonga-Hunga Ha'apai volcano in late 2021 and early 2022, the Tonga Geological Service, in collaboration with Tonga Meteorological Service, similarly provided information on volcanic activity in VONA format, regularly to the ATS unit in Tonga and MWO and

¹ Refer to the IP/02 – *VOLCEX 20/02 Outcomes and Follow-up*, from the Seventh Meeting of the ICAO APAC Volcanic Ash Exercises Steering Group (VOLCEX/SG/07)

VAAC in Wellington, following the requirements of ICAO Annex 3.

3.16. Furthermore, based on the demonstrated provision of information on volcanic activity discussed above, the VAAC Wellington confirmed (in the form of a letter of support for Tonga Meteorological Service, addressed to ICAO) its belief that the above deficiency has been rectified.

3.17. Notwithstanding the validation from New Zealand of Tonga's corrective action, as discussed above, the Meeting noted that Tonga was also expecting (and would provide, when available) a confirmation from the ATS unit of its regular receipt of the information on volcanic activity.

3.18. Given the above, the Meeting recommended that, in addition to the validation discussed in paragraphs 3.12. to 3.14., Tonga should provide evidence of the procedures established for providing information on volcanic activity by the Tonga Geological Service in collaboration with the Tonga Meteorological Service to support validating that the deficiency has been rectified. Tonga can then submit an official report to ICAO providing complete details of the action taken. Finally, ICAO would inform APANPIRG that the deficiency can be removed from the Open List.

4. Regional guidance material

WP/09 – Updates to Regional SIGMET Guide (MET/S WG ad hoc group)

4.1. The MET/S WG ad hoc group, with members from Australia (Rapporteur), Hong Kong, China, Japan and Singapore, presented proposed updates for the ICAO APAC Regional SIGMET Guide, Tenth Edition, prepared by the ad hoc group for approval by the Meeting.

4.2. The proposed updates (presented in Appendix A of WP/09) included:

- Changes to FIR location indicators in Appendix D (of the SIGMET Guide) to realign with the valid FIR location indicators for Cambodia and Indonesia, i.e., FIR Phnom Penh from VDPP to VDPF, FIR Jakarta from WIIZ to WIIF, and FIR Ujung Pandang from WAAZ to WAAF (ref: MET/S WG/12, WP/07 and IP/05); and
- Removal of the sentence “The name may be up to 10 alphanumeric characters” in para. 3.5.3.4. (concerning a named volcano and tropical cyclone) to realign with the format of SIGMET in ICAO Annex 3, Table A6-1A, and the ICAO EUR Regional SIGMET Guide, which enable FIR-, volcano-, and tropical cyclone-name of more than ten alphanumeric characters (Note: the limitation to 10-characters was introduced to the SIGMET Guide based on an interpretation that the ten characters “n” used to represent FIR-, volcano- and tropical cyclone-name in Table A6-1A represented the total number of characters allowed. However, that interpretation is no longer valid. Therefore, a similar reference to FIR name being restricted to 10 alphanumeric characters was previously removed from the SIGMET Guide);

4.3. In addition, the ad hoc group informed the Meeting of other updates it is preparing for further consideration by the next Meeting of the MET/S WG in 2023 (i.e., MET/S WG/13), including:

- Addition of new VAAC Darwin/Washington backup arrangements (ref: MET/S WG 12 and MET/IE WG 20);
- Updates to VAAC backup procedures (to be provided by VAACs Darwin, Tokyo and Wellington);
- Addition of guidance (under development) on SIGMET for volcanic ash crossing FIR boundaries (ref: MET/S WG/11, incl. WP/07); and

- Additional changes are required to align the APAC and EUR Regional SIGMET Guides.

4.4. The Meeting congratulated the ad hoc group and concurred with the proposed updates for the ICAO APAC Regional SIGMET Guide, Tenth Edition (presented in Appendix A of WP/09), and adopted the following Decision:

Decision MET SG/26/01 – Updates to Regional SIGMET Guide	
What: That, the MET SG approves the updates to the SIGMET Guide as presented in Appendix A of WP/09 for use by States and publishing on the ICAO APAC Office website.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-Regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: to make the latest updates to the SIGMET Guide available for use by the States	Follow-up: <input type="checkbox"/> Required from States
When: Now	Status: Adopted by MET SG
Who: <input type="checkbox"/> Sub Groups <input type="checkbox"/> RASG-APAC <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

4.5. The Meeting was informed that the location indicator for FIR Port Moresby was previously identified as incorrect in the SIGMET Guide (Action No. 25/07 refers) and therefore requested the Secretariat to include the correct location indicator in the above approved ICAO APAC Regional SIGMET Guide, Tenth Edition. [**ACTION 26/05**]

WP/10 – Updates of Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations (MET/R WG ad hoc group)

4.6. The MET/R WG ad hoc group, with members from Australia, China, Hong Kong, China, Japan (Rapporteur), Republic of Korea, Singapore, Thailand, Vietnam and IATA, presented proposed updates to the Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations. The ad hoc group prepared the updates for approval by the Meeting.

4.7. The proposed updates (presented in Attachment A of WP/10 and supported by Decision MET/R WG/11/01) included:

- Expanding the maximum number of pages for each State’s example in Appendix 1 of the Guidance from four- to five- pages to allow additional information on the post-operational analysis;
- Adoption of an updated implementation example from Hong Kong, China, on ATM-tailored MET information, including post-operational analysis and continuous service improvement (ref: MET/R WG/11, WP/05); and
- Other minor changes, and tasked the ad hoc group with preparing the final draft of the updates for MET SG/26’s approval.

4.8. Currently, the ICAO APAC E-documents website contains the Regional Guidance for

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Tailored MET to Support ATM document (including all the appendices) and the appendices separately. It was agreed to separate the Appendices from the document to streamline updates. In addition, the ad hoc group would consider adopting additional examples of post-operational analysis provided by States before 30 November 2022.

4.9. The Meeting congratulated the ad hoc group and concurred with the proposed updates to the Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations (presented in Attachment A and B of WP/10) and adopted the following Decision:

Decision MET SG/26/02 – Update the Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations	
What: That, the MET SG approves the proposed updates to the <i>Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations</i> .	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: To provide States with up-to-date guidance material and make the updated version available on the ICAO APAC eDocuments website	Follow-up: <input type="checkbox"/> Required from States
When: As soon as practicable	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

WP/11 – Suggestions on Amendment of ICAO APAC ROBEX Handbook (China)

4.10. China presented progress on the MET SG/25 Action Item 25/14 concerning the proposed amendment to the ROBEX Handbook to reflect China’s requirement for the regular exchange of OPMET bulletins to ROC Beijing from the ROCs Colombo, Jakarta, Kuala Lumpur, Mumbai, Delhi and Kolkata

4.11. China had consulted and confirmed an agreement with Indonesia, Malaysia and Sri Lanka for the proposed amendment. Therefore, China invited the Meeting to proceed with amending the ROBEX Handbook, Appendix A, to add the ROC Beijing AFTN address (ZBBBYPYX) to the destination list for the following OPMET bulletins from ROCs Bangkok, Colombo, Jakarta and Kuala Lumpur: SAAE31, SAAE32, SAAE33, SAAE34, SATH31, SATH32, SATH33, SASB31, SAID31, SAID32, SAID33 and SAMS31.

4.12. China also informed the Meeting that it had tried to contact India concerning India’s agreement to the proposed amendment but unfortunately did not receive a response. Therefore, China invited the Meeting to assist with consulting with India concerning India’s agreement to regular exchange of OPMET bulletins to ROC Beijing and, therefore, amending the ROBEX Handbook, Appendix A, to add the ROC Beijing AFTN address (ZBBBYPYX) to the destination list for the following OPMET bulletins from ROCs Mumbai, Delhi and Kolkata: SAIN31, SAIN32, SAAS31 and SABW31.

4.13. The Meeting thanked China for presenting its progress on the MET SG/25 Action Item 25/14. Following the discussion on the above, the Meeting agreed that the Secretariat would (a) process the amendment discussed in paragraph 4.11., (b) assist China with consulting with India concerning India’s agreement to regular exchange of OPMET bulletins to ROC Beijing, and (c) subject to India’s

agreement, process the proposed amendment in paragraph 4.12. [ACTION 26/06]

5. Planning and monitoring

WP/12 – Review of the Asia/Pacific Air Navigation Plan (Secretariat)

5.1. The Secretariat presented the Asia/Pacific (APAC) Air Navigation Plan (ANP) for the Meeting to review and propose amendments as necessary to reflect updates and changes concerning the current- to medium-term regional operational requirements for the meteorological facilities and services to be implemented by the States.

5.2. The Secretariat reminded the Meeting that the ANP consists of three Volumes, I, II and III, as approved by the ICAO Council in June 2014 in the ANP template for ICAO Regions.

5.3. Volume I contains the stable ANP elements whose amendment should not be required frequently but necessitates approval by the ICAO Council. Volume I, Part V – MET, contains regional requirements for the following meteorological facilities and services:

- World Area Forecast Centres (WAFCs);
- Volcanic Ash Advisory Centres (VAACs);
- Volcano Observatories (VOs) [TABLE MET I-1]; and
- Tropical Cyclone Advisory Centres (TCACs).

5.4. Volume II contains dynamic ANP elements whose amendment does not require approval by the ICAO Council but involves the relevant Planning and Implementation Regional Group (PIRG). Volume II, Part V – MET, contains regional requirements for the following meteorological facilities and services:

- Meteorological Watch Offices (MWOs) [TABLE MET II-1];
- Aerodrome Meteorological Offices [TABLE MET II-2]; and
- VOLMET Broadcasts [TABLE MET II-3].

5.5. Volume III contains dynamic and flexible ANP elements whose amendment does not require approval by the ICAO Council but is under the responsibility of the relevant PIRG. Volume III contains material related to meteorological facilities and services in the following Parts:

- Part I; Implementation indicators for ASBU module B0-AMET [Table GEN III-1];
- Part II; Objectives, priorities and targets for ASBU modules B0-AMET and B1-AMET (in the Main Planning Tables, APAC Seamless ATM plan); and
- Part II; Regional planning, targets, monitoring, challenges and implementation for ASBU module B0-AMET (in the Air Navigation Report Form (ANRF)).

5.6. In addition, the Secretariat informed the Meeting that the previously agreed actions to process the proposals for amendment to the ANP initiated through the MET SG and its WGs were still in progress. However, given that the Secretariat had recently filled a vacancy to assist the Regional Officer, Meteorology, the Secretariat anticipated that it would be able to process the proposals for amendment soon.

5.7. The Meeting noted the advice above and requested the Secretariat process the proposals for amendment identified above as soon as possible.

5.8. In response to a question concerning updating Volume III, the Secretariat noted that the recent discussions in MET SG and APANPIRG had resulted in updates to the MET work plan to include

a proposal for amendment of MET-specific material in Volume III. However, there was no current activity in APANPIRG specifically to amend the whole of Volume III. The Meeting suggested the Secretariat and MET/R WG consider examples of Volume III adopted by other ICAO Regions. [ACTION 26/07]

5.9. In response to a question concerning a proposal for amendment of the ANP Volume II, the Meeting requested the Secretariat assist Nepal with initiating an appropriate amendment to reflect the requirements for aerodrome meteorological offices. [ACTION 26/08]

6. Research, development and other initiatives

IP/02 – WMO Activities of relevance to ICAO (WMO)

6.1. WMO presented information on activities of relevance to ICAO. The information paper provided an overview of the latest organisational structure of WMO in the Services for Aviation application area, key outcomes of an Extraordinary Session of the World Meteorological Congress held in 2021, and WMO's contribution to global and regional initiatives, including those of the Meteorology Panel and the maintenance of the IWXXM schema. In addition, other developments and initiatives were summarised, including the availability of a WMO long-term plan for aeronautical meteorology, efforts to improve gender equality in aeronautical meteorology, initiation of phase 2 of a WMO Aviation Research and Development Project (AvRDP2, 2021-2025), outcomes of a series of Aeronautical Meteorology Scientific Webinars held across all WMO regions in June 2022, availability of biannual newsletters, new and recently updated WMO publications of relevance, and plans for the discontinuation of the Technical Regulations (WMO-No. 49), Volume II, Meteorological Service for International Air Navigation. The dates of key upcoming WMO meetings/events were noted along with a WMO Services for Aviation website (<https://community.wmo.int/activity-areas/aviation>), where information and resources can be accessed for free.

6.2. The Meeting appreciated the information presented by WMO.

WP/13 –WAFS Update (WAFCs London and Washington)

6.3. On behalf of WAFCs London and Washington, WAFS Washington provided an update on recent developments and upcoming changes to the World Area Forecast System (WAFS) service provision by WAFS London and Washington. Recent developments included the availability of WAFS verification data. Upcoming changes included significant upgrades to the WAFS data sets and associated upgrades to how the data will be delivered to users.

6.4. WAFS Washington informed the Meeting that the changes to the WAFS service provision had been agreed upon through the ICAO MET Panel, Meteorological Operations Group (MOG) annual meetings. The changes include upgrades to the horizontal, vertical and temporal resolutions of all WAFS data sets and the content of Significant Weather (SIGWX) forecasts, the dissemination of forecasts in IWXXM form, and the delivery of the upgraded WAFS data and forecasts via the upgraded SADIS and WIFS, as described in WP/13.

6.5. In addition, WP/13 invited the Meeting to recommend SADIS and WIFS users take appropriate action to prepare for the changes to the WAFS service provision and recalled the related outstanding action from MET/S WG/11 to issue a State letter reminding them about these changes, which should include the availability of the WAFS educational flyer and the slide presentation for WP/13.

6.6. The Meeting appreciated the update presented by WAFS Washington. However, the Meeting noted that the WAFCs expected to implement the changes to the WAFS service as early as

November 2023. Therefore, it considered the need to inform WAFS users in the Region further and encourage them to prepare their systems for the significant changes to WAFS data and its delivery.

6.7. The Meeting was reminded that the planned WAFS changes in WP/13 corresponded with proposed Amendments 81 to ICAO Annex 3, which ICAO was yet to approve and adopt. Nevertheless, considering the likelihood that the Amendments to Annex 3 would be adopted and the changes to the WAFS service implemented as planned, the Meeting contemplated the immediacy for action by WAFS users to adapt their systems. Therefore, the Meeting formulated the following Draft Conclusion:

Draft Conclusion MET SG/26/03 – WAFS, SADIS and WIFS upgrades	
<p>What: That, users of WAFS, SADIS and WIFS are invited to:</p> <p>a) familiarise themselves with the proposed WAFS data and technical changes planned for November 2023 and 2024;</p> <p>b) discuss the upcoming changes with their technical departments and make plans for how their organisation could adapt to these technological changes;</p> <p>c) get involved in trying out the new test/beta application programming interfaces (APIs) once they become available in late 2022 or 2023.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-Regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: WAFS, SADIS and WIFS users will have to adapt their systems to benefit from the planned WAFS upgrades, which correspond with proposed Amendments 81 to ICAO Annex 3.</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: by November 2023 and 2024</p>	<p>Status: Draft to be adopted by APANPIRG</p>
<p>Who: <input type="checkbox"/> Sub Groups <input type="checkbox"/> RASG-APAC <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ</p> <p> <input type="checkbox"/> Other:</p>	

WP/14 – SADIS Update (SADIS Provider)

6.8. On behalf of the SADIS Provider, WAFC Washington provided an update on the Secure Aviation Data Information System (SADIS), operated by WAFC London, including SADIS operational matters and recent and upcoming changes in the provision of data on SADIS, as described in detail in WP/14.

6.9. WAFC Washington informed the Meeting that the changes in the provision of data on SADIS had been agreed upon through the annual meetings of the ICAO MET Panel, Meteorological Operations Group (MOG).

6.10. SADIS operational matters included notification of the annual SADIS efficacy survey for 2022 (which commenced on 1 July 2022), availability of the latest edition of the SADIS Data Catalogue, and SADIS Workstation Evaluations.

6.11. Recent changes in the provision of data on SADIS included the dissemination of meteorological data in IWXXM form and the introduction of 0.25-degree WAFS hazard data in line with Amendment 79 to ICAO Annex 3. However, WAFC Washington reminded the Meeting that the existing Turbulence Potential, Icing Potential and 1.25-degree cumulonimbus fields, which are no longer required by ICAO Annex 3, will continue to be published on SADIS until November 2023. Therefore, SADIS users are strongly encouraged to migrate their services from the 1.25-degree hazard

data sets to the new 0.25-degree data set as soon as possible.

6.12. In addition, WP/14 invited the Meeting to recommend SADIS and WIFS users take appropriate action to prepare for the November 2023 discontinuation of 1.25-degree hazard data sets.

6.13. Upcoming changes in the provision of data on SADIS included the next-generation WAFS provision, as already discussed in WP/13.

6.14. The Meeting appreciated the update presented by WAFS Washington. However, given the recent introduction of 0.25-degree WAFS hazard data and upcoming discontinuation of 1.25-degree hazard data sets in November 2023, and recalling the related Conclusion APANPIRG/31/17: *0.25-degree WAFS hazard data*, with associated ICAO State letter Ref.: T 4/8.2 – AP129/21 (MET), dated 15 July 2021, requesting SADIS user States make the necessary systems changes to integrate the new 0.25-degree WAFS hazard data into their SADIS user systems and software, the Meeting considered the need to remind States of the recommended action above and, therefore, adopted the following Draft Conclusion:

Draft Conclusion MET SG/26/04 – 0.25-degree WAFS hazard data	
<p>What: That, users of WAFS, SADIS and WIFS are urged to, if not already done so, integrate the 0.25-degree WAFS hazard data (for cumulonimbus, icing and turbulence) into their systems and software before November 2023.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-Regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: The WAFCs have introduced 0.25-degree WAFS hazard data and will discontinue providing users with the 1.25-degree hazard data sets in November 2023. The previous Conclusion APANPIRG/31/17: <i>0.25-degree WAFS hazard data</i>, and associated ICAO State letter Ref.: T 4/8.2 – AP129/21 (MET), dated 15 July 2021, also requested SADIS user States to make the necessary systems changes to integrate the new 0.25-degree WAFS hazard data into their SADIS user systems and software.</p>	<p>Follow-up: <input checked="" type="checkbox"/> Required from States</p>
<p>When: by November 2023</p>	<p>Status: Draft to be adopted by APANPIRG</p>
<p>Who: <input type="checkbox"/> Sub Groups <input type="checkbox"/> RASG-APAC <input checked="" type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ</p> <p> <input type="checkbox"/> Other:</p>	

IP/03 – VAAC Darwin Management Report (Australia)

6.15. Australia presented the IAVW Management Report for the VAAC Darwin area of responsibility covering the period 1 July 2021 to 30 June 2022. It updated current VAAC Darwin activities, significant operational changes, training and development, collaboration and stakeholder engagement. There were 1702 advisories issued for the reporting period; the Hunga Tonga Hunga Ha’apai eruption provided a good test of operational procedures. It will be used for forecaster training, and multiple backup tests are coming in 2022.

6.16. The Meeting appreciated the information presented by Australia.

IP/04 – VAAC Tokyo Management Report (Japan)

6.17. Japan presented the VAAC Tokyo IAVW Management Report for the period 1 September 2021 through 30 June 2022, including VAAC Tokyo operations, significant eruptions, significant operational and technical changes, VAAC backup between Tokyo and Darwin, VONA issuance drills with PHIVOLCS, and future development.

6.18. The Meeting appreciated the information presented by Japan.

IP/05 – VAAC Wellington Management Report (New Zealand)

6.19. New Zealand presented the management report for the VAAC Wellington covering the period 1 July 2021 to 30 June 2022. It updated current activities, significant operational changes, training and development and collaboration. It also provided an overview of recent backup tests with VAAC Darwin.

6.20. The Meeting appreciated the information presented by New Zealand and noted the local practice of issuing an initial SIGMET to ensure users were aware of a new eruption as soon as possible, rather than waiting for the volcanic ash advisory to be available. The meeting also noted that this practice would be reviewed upon elevating the Volcano Observatory Notice to Aviation to a recommended practice in Annex 3, expected in 2024.

WP/15 – Encouraging Information Provision to the Documents of SIGMET Coordination Activities and their Practices in the APAC Region (MET/S WG ad hoc group)

6.21. The ad hoc group on SIGMET Coordination, with members from China, Fiji, India, Indonesia, Malaysia, Thailand, Vietnam and IFALPA, with Hong Kong China, Japan and Singapore as the joint rapporteurs, provided updates on the development of the online repository for information on SIGMET coordination activities and a document titled *Consolidation of SIGMET Coordination Practices in the APAC Region*. In addition, the ad hoc group proposed the Meeting request ICAO to issue a State letter encouraging States to contribute information to the consolidation document to help facilitate the provision of more efficient and better coordinated SIGMET services.

6.22. The Meeting appreciated the updates provided by the ad hoc group on the online repository and consolidation document. In addition, it noted that the Secretariat had published the link to the online repository on the ICAO APAC eDocuments website.

6.23. Furthermore, the Meeting concurred that additional inputs to the consolidation document from more States would support States with expanding and integrating their SIGMET coordination activities. Therefore, given the above, the Meeting adopted the following Conclusion:

Conclusion MET SG/26/05: Encourage States to provide input on the online repository on SIGMET Coordination and the consolidation document on SIGMET Coordination Practices in the APAC region	
What: That, a) States be invited to provide updates to the online repository on SIGMET Coordination and supplement its local SIGMET issuance practices to the consolidation document on SIGMET Coordination Practices in the APAC region (using the contact details provided in the documents); and b) The ICAO Asia/Pacific Regional Office will notify the States/Administrations of the availability and location of the above documents and invite States' inputs to the consolidation document by issuing a State Letter.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical

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Why: To enhance the SIGMET coordination in the Region by gathering lessons learnt from existing SIGMET coordination activities to facilitate more efficient and better coordinated SIGMET service to meet aviation users' expectations and operational requirements in the Region.	Follow-up: <input type="checkbox"/> Required from States
When: Now	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other: ROs	

IP/06 – Outcome of HKO SIGMET Coordination Training Workshop and Updates on SIGMET Coordination Projects (Hong Kong, China)

6.24. Hong Kong, China, presented the outcome of a SIGMET Coordination Training Workshop organised by the Hong Kong Observatory (HKO) on 15 and 16 June 2022. The Workshop invited experts from meteorological agencies in the Region to share their forecast and coordination practices on various types of hazardous aviation weather and the ICAO Secretariat to deliver a talk on the SIGMET service from a regional perspective. Besides, the Workshop also conducted online training on the HKO Regional SIGMET Coordination Platform, which the participants received well. Furthermore, the Meeting noted that the Workshop successfully brought together MWOs in the APAC Region and improved mutual understanding between aviation forecasters.

6.25. The Meeting commended Hong Kong, China and participating States on their progress in coordinating SIGMET provision, including the transition of SIGMET coordination activities to operational status in May 2022 for FIRs Sanya and Manila and Fiji and Solomon Islands, and enhanced collaboration between the Mekong and GHKPSV SIGMET Coordination groups. In addition, the Meeting noted the above activities highlighted the importance of regular discussions between neighbouring MWOs.

IP/07 – Collaborative SIGMET Issuance (CSI) Project – Recent Progress and Future Plan (Japan, Lao PDR, Myanmar, Philippines, Thailand and Vietnam)

6.26. CSI project member States presented recent progress and the plan of the Collaborative SIGMET Issuance (CSI) Project, including outcomes of the CSI workshop held in January 2022, as detailed in IP/07. Two issues were identified in the workshop: the necessity of a further survey for a wide range of users regarding issues such as acceptable differences of SIGMETs; and improvement of the convenience of utilising multiple web platforms.

6.27. The Meeting appreciated the information presented by CSI project member States and congratulated the States concerned on the progress in coordinating SIGMET information.

IP/08 – New Developments of Meteorological Services Supporting ATM Operations in China (China)

6.28. China presented new developments in meteorological services supporting Air Traffic Management (ATM) operations in China. Meteorological services for the Massive Delay Response System (MDRS) have become one of the critical enablers in the collaborative decision-making of civil aviation in China. Furthermore, several new attempts have been made to strengthen the Meteorology and Air Traffic Management (MET-ATM) integration.

6.29. The Meeting appreciated the information presented by China.

IP/09 – Wind Shear Prediction System in the Republic of Korea (Republic of Korea)

6.30. The Republic of Korea presented information on its operation of a wind shear prediction system to support the safe operation of aircraft taking off and landing at airports. Based on the Republic of Korea's independent local forecast model, the wind shear prediction system produces the probability of vertical wind shear, horizontal wind shear, and vertical wind shear on the take-off and landing routes.

6.31. The Meeting appreciated the information presented by the Republic of Korea.

IP/10 – Latest Development of IWXXM (Hong Kong, China)

6.32. Hong Kong, China, presented the latest development of the ICAO Meteorological Information Exchange Model (IWXXM) in 2021, including the publication of IWXXM Version 2021-2 and further development of IWXXM. WMO informed the Meeting that the IWXXM schema was publicly accessible via URL: <https://schemas.wmo.int/iwxxm/>

6.33. The Meeting appreciated the information presented by Hong Kong, China.

IP/11 – Online Workshop on Light Detection and Ranging (LIDAR) (Hong Kong, China)

6.34. Hong Kong, China, presented its initiative, in collaboration with the World Meteorological Organization (WMO) under the Voluntary Cooperation Programme, to organise and host an online workshop on Light Detection and Ranging (LIDAR). The Workshop is from 13 to 16 September 2022 to raise stakeholders' capability to use LIDAR to detect wind shear and turbulence. Support from ICAO APAC Office was being sought to invite the APAC States to attend the workshop.

6.35. The Meeting appreciated the information presented by Hong Kong, China, and requested that Hong Kong, China records the online workshop and makes it available online, if possible, as reference material for States.

7. Future work programme

WP/16 – Review Work Plan (Secretariat)

7.1. The Secretariat presented the work plan of the Meteorology Sub Group (MET SG) for the Meeting to review and propose updates as necessary to ensure a continued focus on the Asia/Pacific (APAC) Region's requirements for support related to the implementation of meteorological services for international air navigation.

7.2. The Secretariat reminded the Meeting that the work plan listed the deliverables identified and agreed to by the MET SG and included the assignment of corresponding responsibilities, target dates, and the progress status.

7.3. In addition, the Secretariat reminded the Meeting that the Secretariat and Chairs of the MET SG and MET WGs were progressing the agreed action for preparing an integrated work plan for the MET SG and MET WGs. The action aimed to standardise the terminology used in the work plans, realign the activities of the MET SG and MET WGs and make plans easier to follow and manage.

7.4. The Meeting considered the deliverables in the plan. It recommended some changes, including (a) revising the deliverable on the IWXXM workshop to consideration of a MET-focused SWIM workshop, given that IWXXM seminars or workshops have been conducted in recent years, (b) generalising the VOLCEX/SG exercise tasks, (c) revise the deliverable on air navigation deficiencies, given that the MET SG does not "add" or "remove" deficiencies from the APANPIRG list, and (d) update references to MET/IE WG activities given changes to MET/IE WG Work plan.

7.5. The updated work plan agreed upon by the Meeting is provided in **Appendix E** of this Report.

8. Any other Business

Next Meeting

8.1. The Meeting discussed proposals for the next meetings of the MET SG and its contributory Working Groups and agreed to the following schedule, noting that the Meetings would be conducted at the ICAO APAC Office in Bangkok, Thailand, as in-person events, subject to the local situation, and hybrid (online/in-person) arrangements may be possible:

- MET/IE WG/21 – 27-28 March 2023
- MET/IE WG/21 and MET/S WG/13 Conjoint Session – 29 March 2023
- MET/S WG/13 – 30-31 March 2023
- MET/ATM Seminar and MET/R WG/12 – 22-26 May 2023 (TBC)
- MET SG/27 – Late July or early August 2023 (TBC)

8.2. The Meeting noted that the Secretariat would also make arrangements for the (online) eighth meeting of the ICAO APAC Volcanic Ash Exercises Steering Group (VOLCEX/SG/08) and request the States to consider nominating a new Chairperson for the VOLCEX/SG.

WAFS Service Document

8.3. Based on a suggestion from Australia, the Meeting requested the Secretariat remove the WAFS Service Document, which dated back to 2012, from the ICAO APAC Office eDocuments webpage. [**ACTION 26/09**]

Engagement between WMO and ICAO

8.4. WMO thanked ICAO for the opportunity to attend the METSG and to all concerned for the highly informative and well-run Meeting. In the spirit of the working arrangements between WMO and ICAO, it was highlighted that WMO would do what it could – within available resources, other priorities and commitments – to improve the level of engagement with ICAO, its States and others concerned in the APAC Region, including through groups such as METSG.

MET Divisional Meeting

8.5. Responding to a question from the Chair regarding the prospect of another conjoint ICAO/WMO Meteorology Divisional Meeting – noting that the last conjoint Meeting was held in July 2014 in Montreal, Canada and that such high-level meetings had been held typically on a 12-year cycle – WMO indicated that given the governance/structural reforms of both Organisations in recent years it was now considered unlikely that such a conjoint meeting would be convened in, say, four years.

8.6. In this connection and responding to a question from Australia regarding the continued enhancement of collaboration between the two Organisations, WMO advised that there was an ongoing discussion with ICAO, at the global level, concerning the establishment of a ‘joint aviation forum’ (working title) between ICAO’s Meteorology Panel (or its Management Group) and WMO’s Standing

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Report on Agenda Items

Committee on Services for Aviation. WMO or ICAO may relay updated information in this regard to the MET SG at its next Meeting (in 2023).

—END—

TWENTY-SIXTH MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/26)

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List of Participants

	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
1.	AUSTRALIA (5)			
	1.	Mr. Amber Raman	Manager Meteorological Authority Office Australian Bureau of Meteorology	amber.raman@bom.gov.au
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	3.	Mr. Tim Hailes	National Manager – Transport Customer Engagement Australian Bureau of Meteorology	tim.hailes@bom.gov.au
	4.	Mr. Jarrad Denman	VAAC Darwin Manager Australian Bureau of Meteorology	jarrad.denman@bom.gov.au
	5.	Ms. Elizabeth Heba	Aviation Quality Assurance and International Engagement Lead Bureau of Meteorology Australia	elizabeth.heba@bom.gov.au
2.	BHUTAN (1)			
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3.	BRUNEI DARUSSALAM (2)			
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	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
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	12.	Mr. Khun Theara	Chief of Search and Rescue Bureau, ANS department State Secretariat of Civil Aviation of Cambodia	ksctheara@ssca.gov.kh
	13.	Mr. Chvea Thol	Chief of MET Standard Bureau, ANS Department State Secretariat of Civil Aviation of Cambodia	chveathol@yahoo.com
5.	CHINA (6)			
	14.	Mr. Han Qingyuan	Deputy Director of MET Division Air Traffic Management Bureau Civil Aviation Administration of China	hanqingyuan@atmb.net.cn ;
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	16.	Ms. Lin Caiyan	Forecaster Aviation Meteorological Center of Air Traffic Management Bureau Civil Aviation Administration of China	lincaiyan@atmb.net.cn ;

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	18.	Ms. Cao Shan	Senior Engineer Aviation Meteorological Center of Air Traffic Management Bureau Civil Aviation Administration of China	caoshansh@163.com ;
	19.	Ms. Yunxin Chu	Deputy Director of Tianfu Forecast Detection Office The Southwest Bureau of Civil Aviation Administration of China	chuyunxinauntcoco@yeah.net
6.	HONG KONG, CHINA (4)			
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	22.	Mr. Pak-wai Chan	Assistant Director Hong Kong Observatory	pwchan@hko.gov.hk
	23.	Mr. Marco Mang-Hin KOK	Acting Senior Scientific Officer Hong Kong Observatory	mhkok@hko.gov.hk
7.	MACAO, CHINA (1)			
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8.	FIJI (1)			

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	STATE/NAME		TITLE/ORGANIZATION	E-MAIL
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	STATE/NAME	TITLE/ORGANIZATION	E-MAIL
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	STATE/NAME	TITLE/ORGANIZATION	E-MAIL
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15.	PAKISTAN (1)		

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	STATE/NAME	TITLE/ORGANIZATION	E-MAIL
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	62. Ms. Rhea Angela R. Bitas	Air Traffic Management Officer Civil Aviation Authority of the Philippines	<u>anj_trinity@yahoo.com</u>

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	STATE/NAME	TITLE/ORGANIZATION	E-MAIL
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	STATE/NAME	TITLE/ORGANIZATION	E-MAIL
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83.	Mr. Somchai Yimsricharoenkit	Head of Aeronautical Meteorology Oversight Division Civil Aviation Authority of Thailand	somchai.y@caat.or.th
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86.	Mr. Putchaphan Sirisap	Acting Director of Aeronautical Meteorology Research and Development Sub-Standard Division Thai Meteorological Department	siri_putch@hotmail.com
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	90. Mr. Worapoj Yodjabog	Aeronautical Information Manager Aeronautical Radio of Thailand Ltd. (AEROTHAI)	worapoj.yo@aerOTHai.co.th
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	93. Mr. Pongpob Mongkolpiyathana	Executive Air Traffic Systems Engineer Aeronautical Radio of Thailand Ltd. (AEROTHAI)	pongpob.mo@aerOTHai.co.th
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	99. Mr. Shayne Campbell	Senior Air Traffic Representative Asia Pacific United States Federal Aviation Administrative (FAA)	shayne.a.campbell@faa.gov
	100. Mr. Michael L. Graf	Meteorologist International Liaison United States National Weather Service	<u>michael.graf@noaa.gov</u>
24.	VIET NAM (8)		
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	102. Ms. Nguyen Lan Oanh	Deputy Director of Air Navigation Department Civil Aviation Authority of Vietnam	lanoanh@caa.gov.vn
	103. Mr. Le Quoc Khanh	Deputy General Director Vietnam Air Traffic Management Cooperation (VATM)	lequockhanh@vatm.vn
	104. Ms. Phan Ba Hung	Official – Department of Air Traffic Services Vietnam Air Traffic Management Cooperation (VATM)	<u>hungpb@vatm.vn</u> ; <u>hungpb@yahoo.com</u> ;

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	107. Mr. Nguyen Cong Dung	Manager of Da Nang Aeronautical Meteorological Centre Vietnam Air Traffic Management Cooperation (VATM)	ncdung0520@gmail.com
	108. Ms. Tran Thi Khan Huong	Manager of Tan So Nhat Aeronautical Meteorology Centre Vietnam Air Traffic Management Cooperation (VATM)	khanhhuoug@vatm.vn
25.	IATA/AIRLINES INDUSTRY (3)		
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	110. Mr. Chris Nichos	Fligh Dispatch Manager International Air Transport Association (IATA)	chris.nichols@virginaustralia.com
	111. Mr. John Moore	Assistant Director, Safety & Flight Asia Pacific International Air Transport Association (IATA)	moorej@iata.org
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	112. Mr. Greg Brock	Head, Services for Aviation World Meteorological Organization (WMO)	gbrock@wmo.int
27.	ICAO (1)		

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LIST OF PAPERS

WP/IP/SP No.	Agenda Item No.	Subject	Presented by
WORKING PAPERS			
WP/01	1	Adoption of the Agenda	Secretariat
WP/02	1	Review the Terms of Reference	Secretariat
WP/03	2	Review Outcomes from MET SG/25	Secretariat
WP/04	2	Review Outcomes from APANPIRG/32	Secretariat
WP/05	2	Review Outcomes from MET/IE WG/20	Chair of MET/IE WG
WP/06	2	Review Outcomes from MET/S WG/12	Chair of MET/S WG
WP/07	2	Review of MET/R WG/11	Chair of MET/R WG
WP/08	3	Online APANPIRG Air Navigation Deficiencies	Secretariat
WP/09	4	Updates to Regional SIGMET Guide	Australia on behalf of Ad-Hoc Group
WP/10	4	Updates of Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations	Japan on behalf of Ad-Hoc Group
WP/11	4	Suggestions on Amendment of the ICAO APAC ROBEX Handbook	China
WP/12	5	Review of the Asia\Pacific Air Navigation Plan	Secretariat
WP/13	6	WAFS Update	WAFS London and Washington
WP/14	6	SADIS Update	SADIS Provider
WP/15	6	Encouraging Information Provision to the Documents of SIGMET Coordination Activities and their Practices in the APAC Region	Hong Kong, China on behalf of Ad-Hoc Group
WP/16	7	Review Plan of Work	Secretariat
WP/17	3	Update on MET Deficiencies AP-MET-23	Solomon Islands

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WP/IP/SP No.	Agenda Item No.	Subject	Presented by
WP/18	2	SWIM Architecture Support for MET Information Services	MET Experts in SWIM TF
WP/19	3	Resolution of MET Deficiencies AP-MET-04	New Zealand on behalf of Papua New Guinea
WP/20	3	Resolution of AP-MET-17 Information on Volcanic Activity	New Zealand on behalf of Tonga
INFORMATION PAPERS			
IP/01	1	Meeting Bulletin	Secretariat
IP/02	6	WMP activities of relevance to ICAO	WMO
IP/03	6	VAAC Darwin Management Report	Australia
IP/04	6	VAAC Tokyo Management Report	Japan
IP/05	6	VAAC Wellington Management Report	New Zealand
IP/06	6	Outcome of HKO SIGMET Coordination Training Workshop and Updates on SIGMET Coordination Projects	Hong Kong, China
IP/07	6	Collaborative SIGMET Issuance (CSI) Project – Recent Progress and Future Plan	Japan, Lao PDR, Myanmar, Philippines, Thailand and Viet Nam
IP/08	6	New Developments of Meteorological Services Supporting ATM Operations in China	China
IP/09	6	Wind Shear Prediction System in the Republic of Korea	Republic of Korea
IP/10	6	Latest Development of IWXXM	Hong Kong, China
IP/11	6	Online Workshop on Light Detection and Ranging (LIDAR)	Hong Kong, China

APPENDIX C

MET SG – LIST OF ACTIONS

Action items recorded by MET SG/26

MET SG – LIST OF ACTIONS				
Action No.	Detailed description of actions	Responsibility	Target date	Status
26/01	<p><i>MET Deficiencies template and guidance documents:</i> Finalise and publish the <i>MET Deficiencies template</i> and <i>guidance</i> documents (from Appendix F of the Report of MET SG/25) as stand-alone documents on the ICAO APAC Office “eDocuments” webpage. [Ref: Report of MET SG/26, para. 2.4.]</p>	Secretariat and ad hoc group on MET deficiencies	Nov 2022	To commence
26/02	<p>Papers for MET/S WG on QMS: Request papers for future meetings of the MET/S WG on issues concerning the implementation and monitoring the implementation of QMS in the Region. [Ref: Report of MET SG/26, para. 2.18.]</p>	Secretariat and Chair of MET/S WG	Dec 2022	To commence
26/03	<p>Paper for CNS SG/26 on Draft Decision SWIM TF/06/01: Submit a paper to CNS SG/26 highlighting that the MET SG/26 noted the importance of CNS SG/26 adopting the proposal in Draft Decision SWIM TF/06/01. [Ref: Report of MET SG/26, para. 2.31.]</p>	Secretariat	Aug 2022	To commence
26/04	<p>APANPIRG AN Deficiencies – requirements for WAFS forecasts: Provide technical assistance to help the States concerned understand and determine the requirements for WAFS forecasts. [Ref: Report of MET SG/26, para. 3.2.]</p>	Secretariat	Nov 2022	To commence
26/05	<p>Location indicator for FIR Port Moresby in the SIGMET Guide: Include the correct location indicator for FIR Port Moresby (as previously identified in Action No. 25/07) in the approved ICAO APAC Regional SIGMET Guide, Tenth Edition. [Ref: Report of MET SG/26, para. 4.5.]</p>	Secretariat	Nov 2022	To commence
26/06	<p>ROBEX Handbook amendments for the regular exchange of OPMET bulletins to ROC Beijing: (a) Amend the ICAO APAC ROBEX Handbook as discussed in the Report of MET SG/26, para. 4.11.; (b) Assist China with consulting with India concerning India’s agreement to regular exchange of OPMET bulletins to ROC Beijing; and (c) Subject to India’s agreement, Amend the ROBEX Handbook as discussed in the Report of MET SG/26, para. 4.12. [Ref: Report of MET SG/26, para. 4.13.]</p>	Secretariat	Nov 2022	To commence

MET SG/26
Appendix C – List of Actions

MET SG – LIST OF ACTIONS				
Action No.	Detailed description of actions	Responsibility	Target date	Status
26/07	APAC ANP, Volume III amendment – examples from other ICAO Regions: Consider examples of Volume III adopted by other ICAO Regions in the MET work plan on a proposal for amendment of MET-specific material in the APAC ANP, Volume III. [Ref: Report of MET SG/26, para. 5.8.]	Secretariat and MET/R WG	Nov 2022	To commence
26/08	APAC ANP, Volume II amendment – Nepal: Initiate an appropriate proposal for amendment of the ANP Volume II, to reflect the requirements for aerodrome meteorological offices in Nepal. [Ref: Report of MET SG/26, para. 5.9.]	Secretariat and Nepal	Nov 2022	To commence
26/09	Outdated WAFS Service Document: Remove the WAFS Service Document, which dated back to 2012, from the ICAO APAC Office eDocuments webpage. [Ref: Report of MET SG/26, para. 8.3.]	Secretariat	Nov 2022	To commence

Unresolved action items recorded by MET SG/25

MET SG – LIST OF ACTIONS				
Action No.	Detailed description of actions	Responsibility	Target date	Status
25/04	Revise the Work Plan of MET/R to take the lead in developing the proposed amendment to ANP Volume III in coordination with MET/IE and MET/S [Ref: para. 2.5.]	Secretariat and MET/R WG	Nov 2021	To commence
25/05	Reach out to States concerned with air navigation deficiencies to identify and record target dates for resolving their respective air navigation deficiencies [Ref: para. 4.3.]	Secretariat	Nov 2021	In progress
25/06	Finalise the proposals for amendment of the APAC ANP (Vol I and II) and ROBEX Handbook as agreed in previous meetings to ensure accuracy of the requirements specifications against which the OPMET monitoring is analysed [Ref: para. 4.6.-4.7.]	Secretariat	Nov 2021	In progress
25/07	Finalise a proposal for amendment of the APAC ANP (Table MET II-1) and consequential amendment to the APAC Regional SIGMET Guide as necessary to ensure the correct use of FIR indicator for Port Moresby [Ref: para. 4.12.-4.14.]	Secretariat	Nov 2021	In progress; ANP amendment pending; SIGMET Guide amended, 9 th Ed.
25/09	Review SIGMET Guide as necessary to guide MWOs to handle cases when VAAC would not hand over to the neighbouring VAAC even if the ash cloud is expected to cross the AoR [Ref: para. 4.12.-4.14.]	MET/S	Mar 2023	To commence

MET SG/26
Appendix C – List of Actions

MET SG – LIST OF ACTIONS				
Action No.	Detailed description of actions	Responsibility	Target date	Status
25/10	Assist the Solomon Islands in aligning procedures with ICAO Annex 3, conducting SIGMET monitoring by RODBs and follow-up SIGMET tests to demonstrate ICAO-compliant content, format and timeliness of SIGMET information service and its sustainability [Ref: para. 4.15.-4.18.]	Solomon Islands, Secretariat, Australia and New Zealand	Feb 2022	In progress; Ref: MET/S WG/12 IP/11
25/11	Coordinate removal of AN deficiency AP-MET-23 from the open list with the relevant ICAO bodies (MET/S WG, MET SG and APANPIRG) after receipt of the additional evidence and report from Solomon Islands [Ref: para. 4.19.]	Secretariat	Mar 2022	To commence
25/12	Provide updates to the contact lists in the ICAO Doc 9766-AN/968 (Handbook on the International Airways Volcano Watch (IAVW)) to the ICAO METP [Ref: para. 5.15.]	MET SG, MET/S WG, MET/IE WG	Mar 2022	To commence
25/13	Coordinate possible SWX advisory exercise/s and training workshop/s with the appropriate body under METP for [Ref: para. 5.28.]	Secretariat MET/S WG, MET/IE WG	Nov 2021	In progress; ICAO APAC webinar on space weather information service (TBD in Q3/Q4 2022); Secretariat to coordinate with Australia [MET/IE WG/20 - ACTION 01]; MET/R WG new deliverable #7 to promote user education on SWX service.
25/14	Finalise the proposed amendment to the ROBEX Handbook, Table A, Appendix A , to reflect the requirement of China for regular exchange of OPMET bulletins with Sri Lanka, Indonesia, Malaysia and India in consultation with States concerned [Ref: para. 6.1.-6.2.]	Secretariat	Nov 2021	In progress

APPENDIX D

Terms of Reference for APANPIRG Meteorology Sub-Group (MET SG)

(Updated 16 December 2020, Decision APANPIRG/31/16 refers)¹

1. Objectives of the MET SG

- a) Ensure the continuous and coherent development of the MET parts of the Asia/Pacific Regional Air Navigation Plan (APAC ANP) and other relevant regional documentation in a manner that is harmonized with adjacent regions, consistent with ICAO standards and recommended practices (SARPs), the Global Air Navigation Plan and the Global Aviation Safety Plan and reflects global requirements;
- b) Facilitate the implementation of aeronautical meteorological systems and services, as identified in the APAC ANP, Aviation System Block Upgrade (ASBU) priority modules and Asia/Pacific Seamless ANS Plan elements, with due observance to the primacy of air safety, regularity and efficiency; and
- c) Identify and address specific air navigation deficiencies in the field of aeronautical meteorological (MET) services.

2. Functions of the MET SG:

- a) Review MET parts of the APAC ANP, prepare amendment proposals as necessary to reflect updates and changes in the operational and global requirements;
- b) Monitor the level of and, as necessary, facilitate the implementation of aeronautical meteorological services to support the effective implementation of ASBU priority modules and the Asia/Pacific Seamless ANS Plan elements;
- c) Identify air navigation deficiencies in the field of aeronautical meteorology, e.g., through systems performance monitoring) and, where necessary, propose appropriate corrective action and facilitate the development and implementation of action plans by States to resolve identified deficiencies;
- d) Review and update the APANPIRG list of air navigation deficiencies in the field of aeronautical meteorology, as necessary, to reflect the current situation;
- e) Monitor research and development and trials and demonstrations in the field of aeronautical meteorology and other relevant areas and facilitate the transfer of this information and expertise, as necessary, between States;
- f) Make specific recommendations and develop guidance materials aimed at improving aeronautical meteorological services through the use of existing and/or new procedures, facilities and technologies;
- g) Review and identify inter-regional and intra-regional coordination issues in the field of aeronautical meteorology and, as necessary, recommend actions to address those issues; and

¹ Extracted from the APANPIRG Procedural Handbook, Sixth Edition — 1 June 2020, A/L No 01

- h) Identify and progress environmental initiatives related to aeronautical meteorology.

3. Establishment of the MET SG

3.1. The Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG) established the MET SG to assist in its planning and implementation work, charging MET SG with preparatory work on specifically defined problems in the field of aeronautical meteorology requiring expert advice for their resolution. APANPIRG also appointed MET SG as the 'parent' group for other contributory bodies working in the field of aeronautical meteorology for APANPIRG.

4. Membership of the MET SG

4.1. Membership of the MET SG comprises experts provided by States, whether Members or not of the APANPIRG, International Organizations and bodies having experience in the provision of aeronautical meteorological information and services.

5. Chairing and Secretary of the MET SG

5.1. The MET SG shall elect a Chairperson, and Vice-Chairperson if needed, from the experts provided by States. The maximum term of the Chairperson and Vice Chairperson is four years. The Secretary of APANPIRG will appoint the Secretary of the MET SG.

6. Meetings of the MET SG

6.1. The Chairperson of the MET SG, in consultation with Members and the Secretary, shall decide the date and duration of Meetings. As a rule, the MET SG should agree, at each Meeting, on the date and duration of the next Meeting and on a tentative schedule of future Meetings.

7. Documentation and Record of Meetings of the MET SG

7.1. The MET SG shall record the proceedings of its Meetings in the form of a Report or a Summary and submit the Report or Summary for review and consideration by APANPIRG. A Meeting Report should cover completed action on any part of the MET SG work plan and outline the needs of MET SG for further directives or guidance from the APANPIRG to proceed in its work. Reports on Meetings shall be of a simple layout and as concise as practicable and should normally cover:

- a) Short introduction;
- b) Summary of findings (presented in the order of discussion of the agenda items, including any proposals for action); and
- c) Work plan and schedule for future Meetings.

7.2. The Secretary should publish the Report as early as practicable (21-days) after the Meeting.

7.3. The Secretary should disseminate the meeting invitation as early as practicable, i.e., not less than 3-months before the Meeting, and reminders for submission of papers approx. 6-weeks and 1-week before the due date for submission of papers.

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Appendix D – Terms of Reference

7.4. Contributors should submit papers to the ICAO Secretariat as early as practicable, i.e., 28-days before the Meeting at which they are intended to be considered. The Secretary should publish papers, and send a notification of their availability, as early as practicable, i.e., 14-days before the Meeting at which they are intended to be considered.

7.5. The Secretary, in consultation with the Chairperson, may decide to accept papers submitted less than 28-days before the Meeting at which they are intended to be considered when there is a clear benefit to the Meeting in doing so.

8. Delegated authority of the MET SG

8.1. The MET SG may propose actions for further consideration by APANPIRG and record these in the MET SG Report as either draft Conclusions or draft Decisions of APANPIRG.

8.2. Additionally, APANPIRG has empowered MET SG to adopt proposals for action on technical matters (especially those concerning guidance to States in the implementation of ICAO SARPs and global and regional plans) that do not have additional economic, environmental, inter-regional or political effects, which should be considered by APANPIRG. The MET SG shall record these in its Meeting Report as Conclusions or Decisions of MET SG.

MET SG/26
Appendix E – Work Plan

APPENDIX E

**METEOROLOGY SUB-GROUP (MET SG)
WORK PLAN**

ToR Ref*	Detailed description of deliverable	Responsibility	Target date	Status of progress
a) to h)	Coordination meeting for the Chairs of MET SG, MET/R WG, MET/IE WG, MET/S WG, VOLCEX/SG	Chair MET SG and Secretariat	Dec 2021 Mar 2022 Jun 2022 Sep 2022	In progress
a)	Draft amendment proposal for APAC ANP to fulfil missing data in Tables MET	MET/S WG and Secretariat	Mar 2022	In progress
a)	Draft amendment proposal for APAC ANP to clarify the MET-related implementation planning guidance in the ANRF and other parts of Volume III	MET/R WG MET/IE WG MET/S WG with guidance from ICAO	May 2022	In progress
b) c) g)	Organisation and Analysis of APAC Regional SIGMET test	MET/S WG (Activity 1 and 3) MET/IE WG (Activity 3)	Mar 2022	In progress
b) c) g)	Analysis of APAC Regional OPMET-availability monitoring exercise	MET/IE WG (Activity 1)	Mar 2022	In progress
b) c)	Analysis of APAC Regional OPMET-timeliness, -compliance and -regularity monitoring exercises	MET/IE WG (Activity 2)	Mar 2022	In progress
b) g)	Analysis of APAC Regional VAAC backup tests	MET/IE WG (Activity 4)	Mar 2022	In progress
b) g)	Analysis of APAC Regional IROG backup tests	MET/IE WG (Activity 5)	Mar 2022	In progress
b)	Revised draft regional guidance material on MET information needed to support the elements of the APAC Seamless ANS Plan	MET/R WG (Deliverable 3)	May 2022	In progress
b) c) g)	Final report on ICAO volcanic ash exercises APAC VOLCEX TBD (Papua New Guinea, North-east Asia, Philippines, etc.)	APAC VOLCEX/SG (Milestone 5)	TBD	Not started
b) e) g)	Final report on ICAO volcanic ash exercise APAC VOLCEX TBD (North-east Asia)	APAC VOLCEX/SG (Milestone 9)	TBD	Not started
b) e) g)	Final report on ICAO volcanic ash exercise APAC VOLCEX TBD (Philippines)	APAC VOLCEX/SG (Milestone 8)	TBD	Not Started
c) d)	Update the reporting form on APANPIRG AN deficiencies database to reflect progress to add/remove deficiencies in the MET field	MET SG Chair, Secretariat	Jun 2022	In progress

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Appendix E – Work Plan

ToR Ref*	Detailed description of deliverable	Responsibility	Target date	Status of progress
c) d)	Reporting form updates showing the status of implementation of corrective action for the resolution of AN deficiencies in the MET field	MET/S WG (Activity 2 and 6)	Mar 2022	In progress
f)	Progress report on implementation and testing of IWXXM exchange	MET/IE WG (Activity 7 5)	Jun 2022	In progress
g)	Information on ICAO provisions related to meteorological authority and quality assurance, cost recovery, competency, training and qualifications for meteorological service provision shared with States	MET SG Chair, Secretariat	Jun 2022	In progress
g)	Analysis of MET information used in the Region specifically to support ATM operations	MET/R WG (Deliverable 2)	May 2022	In progress
g)	Plan and organise a seminar on regional implementation of MET information to support ATM operations	MET/R WG (Deliverable 5)	May 2022	In progress
h)	Environmental Issues Identify issues in the field of aeronautical meteorology related to environmental issues	MET SG Chair, Secretariat	Jun 2022	In progress
b) e) g)	Consideration of a MET-focused SWIM IWXXM workshop Plan and conduct the IWWXM workshop based on outcomes from a survey of States' requirements for IWXXM implementation support	Secretariat, MET/IE WG Chair	TBD	Not started
e) f) g)	SIGMET coordination activities in APAC Region Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.	MET/R WG (Deliverable 7) MET/S WG (Activity 8)	Jun 2022	In progress
	Update Regional Guidance for Tailored Met Information and Services to Support ATM Operations	MET/R WG	May 2022	In progress
	Develop User Requirements for SWIM-based MET Information Services Supporting ATFM	MET/R WG	May 2022	In progress
	MET expert contribution to SWIM/TF – Identify meteorological expert/s to contribute to the APAC SWIM/TF to ensure meteorological aspects are fully considered	MET SG	Nov 2021	In progress

* Corresponding functions of the MET SG, as listed in the *Terms of Reference of the MET SG* (Ref: APANPIRG Procedural Handbook, Sixth Edition — 1 June 2020, A/L No 01)

— END —