INTERNATIONAL CIVIL AVIATION ORGANIZATION

REPORT OF THE THIRTEENTH MEETING OF THE METEOROLOGICAL SERVICES WORKING GROUP (MET/S WG/13)

(Bangkok, Thailand, 29 - 31 March 2023)

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

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

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HISTORY OF THE MEETING

1. Dates and venue

1.1. The ICAO Asia and Pacific (APAC) Office hosted the Thirteenth Meeting of the Meteorological Services Working Group (MET/S WG/13) in Bangkok, Thailand, from 29 to 31 March 2023.

1.2. The first meeting day, 29 March 2023, included a conjoint session with the Twenty-first Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/21) to jointly discuss agenda items relevant to both the MET/IE WG and MET/S WG.

2. Attendance

2.1. Forty-Eight (48) participants attended the Meeting from sixteen (16) States/Administrative Regions and one (1) International Organization, including Australia, Bhutan, Brunei Darussalam, Cambodia, Hong Kong China, Fiji, India, Indonesia, Japan, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Thailand, Viet Nam and ICAO. The list of participants is in **Appendix D** of the Report.

3. Officers and Secretariat

3.1. Ms Paula Acethorp, Chief Meteorological Officer, Civil Aviation Authority of New Zealand, presided as Meeting Chair.

3.2. Mr Tim Hailes, National Manager, Transport Customer Engagement, Bureau of Meteorology, Australia, and Mr Marco Mang-Hin Kok, Acting Senior Scientific Officer, Hong Kong Observatory, assisted as Co-Chairs for the conjoint Meeting session.

3.3. Mr Peter Dunda, Regional Officer Aeronautical Meteorology and Environment, ICAO APAC Office, acted as Secretary for the Meeting.

4. Language and Documentation

4.1. The working language of the Meeting was English, inclusive of all documentation and this Report. The Meeting considered three (3) Working Papers (WPs) in the MET/IE WG/21 and MET/S WG/13 conjoint meeting session between, plus thirteen (13) WPs, ten (10) Information Papers (IPs) and one Flimsy in the MET/S WG/13 meeting session. The list of papers is in **Appendix E** of this Report.

5. Outcomes

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

a) Draft Conclusions: formulated by the Working Group for further consideration by the Meteorology Sub Group (MET SG), deal with matters of a technical nature and of regional applicability that, according to the MET SG's terms of reference, require the attention of States, or action by the ICAO, following established APANPIRG procedures;

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

c) Decisions: adopted by the Working Group, relate solely to matters dealing with the internal working arrangements of the Working Group.

5.2. The Meeting formulated the following three (03) Draft Conclusions:

Draft Conclusions

Draft Conclusion MET/S WG/13-01: ***PUBLICATION AND FURTHER DEVELOPMENT OF THE DOCUMENT ON CASES OF SIGMET COORDINATION PRACTICES IN THE APAC REGION***
That, the MET SG approves publishing the document on Cases of SIGMET Coordination Practices in the APAC Region on the ICAO APAC Office website as a living document and States are invited to provide further input to the document in order to facilitate more efficient and better coordinated SIGMET service to meet aviation users' expectations and operational requirements in the Region.

Draft Conclusion MET/S WG/13-02: ***DISESTABLISHMENT OF THE VOLCEX SG AND PROPOSED MET EXERCISE PLANNING***	
What: That, the MET SG approves the disestablishment of the VOLCEX Steering Group and instead includes in its work plan the establishment of ad hoc groups to undertake specific exercises on either volcanic ash or space weather scenarios, reporting back under a new MET SG agenda item for MET exercises. Further, States are encouraged to report under this agenda item on activities within their countries on aviation-focused MET exercises.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒Economic ☒ Environmental ☒ Ops/Technical
Why: There is a need to conduct space weather exercises; however, given that the VOLCEX Steering Group (which reports to the MET Services WG) has been unable to find a new chair to continue leading the group's work, it is not considered appropriate to expand the remit of the VOLCEX SG. Instead, it would be more valuable to create ad hoc groups to plan specific exercises focused on both volcanic ash and space weather scenarios and to report back to the MET SG (and any other interested APANPIRG WG) on their results. Further, by creating an agenda item on MET exercises, States can share any lessons learnt from exercises conducted within their countries.	Follow-up: ☐Required from States
When: September 2023	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: ROs	

Draft Conclusion MET/S WG/13-03: ***METEOROLOGICAL SEMINARS***

What: That, MET SG coordinate the provision of meteorological seminars, covering topics related to ICAO changes, new procedures and policies, future services and information exchange to support States implementing ICAO Annex 3 requirements and education.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒Economic ☒eEnvironmental ☒ Ops/Technical
Why: Currently only a subset of APAC States attend ICAO meteorological related meetings. Attendance (virtually) at ICAO meetings during COVID demonstrated that there is significant demand from States for further information. Attendance at ICAO meetings comes at an environmental and financial cost. The provision of Meteorological Seminars will enable a wider group of stakeholders, from more States, to receive advice and stay informed of the latest ICAO developments, offering both financial and environmental benefits.	Follow-up: ☐Required from States
When: September 2023	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: ROs	

Draft Decisions

[Nil]

Decisions

[Nil]

Action Items

5.3. In addition, the Meeting recorded four (4) new action items, including two (2) from the conjoint session, as indicated throughout the Report on Agenda Items below and presented in the List of Actions in **Appendix A** to this Report.

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REPORT ON AGENDA ITEMS – CONJOINT SESSION OF MET/IE WG/21 AND MET/S WG/13

1. Volcanic ash advisory centre (VAAC) backup tests

1.1 No papers were discussed under this agenda item. However, the MET/S WG/13 meeting session reviewed IP/09 under agenda item 6 in which the VAACs Darwin, Tokyo and Wellington reported information on VAAC backup tests conducted between VAACs Darwin-Wellington, Darwin-Tokyo, Washington-Montreal, and Darwin-Washington.

2. SIGMET tests

WP/C01 – REVIEW OF WS SIGMET TEST 2022 (Singapore)

2.1 The ICAO APAC Regional SIGMET Test 2022 for weather and other phenomena (apart from tropical cyclone and volcanic ash) was conducted on 23 November 2022.

2.2 Data from the test, as compiled, analyzed and presented by the SIGMET test focal point from Singapore, indicated the following results:

- The rate of participation in the SIGMET test by States was 86%, which is an improvement compared to 79% in 2021 and 2020;
- SIGMET test messages were not received from four (4) States: Afghanistan, DPR Korea, Nauru and Papua New Guinea;
- The average rate of reception of SIGMET test messages at APAC RODBs, Bangkok, Brisbane, Singapore and Tokyo, and ROC London was 99%; however, the rate of reception at RODB Nadi was considerably lower at 65%; and
- A few errors were identified in the test messages: one (1) incorrect priority indicator in a message header; and two (2) messages with invalid formats.

2.3 The 2022 SIGMET test was the first test to include IWXXM format SIGMETs, in addition to the traditional alphanumeric format. Nine MWOs issued IWXXM format SIGMETs during the test: Hong Kong, Taibei, Nadi, Tokyo, Wellington, Manila, Singapore, Honiara and Bangkok.

2.4 The Meeting noted the MET/IE WG and MET/S WG activities concerning follow-up on the SIGMET test results. The Secretariat, in coordination with the (MET/S WG) ad hoc group on air navigation deficiencies, would advise States concerned of the deficiencies identified in the SIGMET test (i.e., non-participation in the test, message reception issues, and message errors) and propose corrective actions.

2.5 In addition, the Meeting was reminded that ICAO Annex 3, Table A6-1A, *Template for SIGMET and AIRMET messages*, enables States to use the status indicator TEST* to indicate that a SIGMET test is taking place and the message may contain information that should not be used operationally. Therefore, States are able to send SIGMET test messages as required at any time throughout the year, e.g., to validate the rectification of deficiencies in their systems, or to ensure effective dissemination following system upgrades.

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

* Applicable from 7 November 2019

2.6 The ICAO APAC Regional SIGMET Tests 2022 for tropical cyclone and volcanic ash were conducted on 9 and 16 November 2022, respectively.

2.7 Data from the tests, as compiled, analyzed and presented by the SIGMET test focal point from Japan, indicated the following results:

- WC SIGMET test bulletins were not received from four (4) (APAC) States: DPR Korea, Myanmar, Nauru and Papua New Guinea;
- WV SIGMET test bulletins were not received from five (5) (APAC) States: Afghanistan, Cambodia, DPR Korea, Nauru and Papua New Guinea;
- The overall availability of WC and WV test bulletins was 78% and 87%, respectively, which was slightly better than in 2021 (76% and 86%);
- Few errors were identified in the (APAC[†]) WC and WV test bulletins: one (1) incorrect priority indicator in a message header; and eight (8) messages with errors in the SIGMET code elements; and
- SIGMET test messages in the IWXXM form were received from some (APAC) States, including: Australia, China (MWO Hong Kong and MWO Taibei), Fiji, Japan, Singapore, Solomon Islands and Thailand.

2.8 The Meeting noted the follow-up activities by New Zealand, French Polynesia, Australia and Mongolia in resolving issues related to the availability of IWXXM test format SIGMETs. Further, the Meeting noted Fiji's explanation of the early date-time group in their TCA and WV/WC SIGMET headers relating to each of the messages being prepared ahead of time.

2.9 The Meeting appreciated the efforts of RODB Tokyo to extend the WV and WC test analysis to include information on the number of test SIGMETs issued by each MWO, relating to the number of separate advisories they received from each of their related VAACs or TCACs (ref: MET/IE WG/19 and MET/S WG/11 action item 02, which the Meeting considered was now closed).

2.10 Regarding the data on SIGMET test messages in IWXXM form, the Meeting noted that the designated ad hoc group had developed updates in the ICAO APAC Regional SIGMET Test Procedures 2022 to include guidance on SIGMET test messages disseminated in the IWXXM form (ref: MET/IE WG/20 action item 16, which the Meeting considered was now completed).

2.11 The Chair encouraged States to utilize the SIGMET test functionality to validate SIGMET capability following system changes.

2.12 To take full advantage of the IWXXM test messages and consider the IWXXM-specific statistics (ref: MET/IE WG/21 IP/07), the Meeting requested Thailand, in coordination with the SIGMET test focal points (Japan and Singapore), to include the IWXXM-specific statistics, such as IWXXM versions, in future SIGMET test results. [**ACTION MET/IE WG 21 – 17**]

2.13 The Meeting further requested the Secretariat and Chair in coordination with the designated ad hoc group to ensure that the APAC Regional SIGMET Guide be updated to include MWO Ulaan Baatar in the MWO list and to include the additional headers used by MWO Tahiti for their SIGMETs. [**ACTION MET/S WG 13 – 01**]

[†] In addition to the participation by APAC Region States, the ICAO APAC SIGMET Test procedures, and the SIGMET test results presented, include test messages sent by TCACs, VAACs and MWOs in neighbouring ICAO Regions.

3. Any other business

MET/IE WG/21 WP/16 and MET/S WG/13 – PROPOSALS FOR THE AMENDMENT OF ICAO ANNEX 3 (Secretariat)

3.1 ICAO State letters Ref.: AN 10/1-23/1 and AN 2/36-23/6, dated 26 January and 13 February 2023, respectively, presented several proposals for the amendment of ICAO Annex 3. Accordingly, States and appropriate international organizations that wished to provide ICAO with any comments on the amendment proposals presented in the State letters were requested to do so no later than 26 July and 14 August 2023, respectively.

3.2 State letter, ref.: AN 10/1-23/1 presented proposals for the amendment of Annex 3, the new PANS-MET and consequential amendments to Annex 6 (Parts I, II and III), Annex 10 (Vol. II), Annex 11, Annex 15, PANS-ABC, PANS-AIM and PANS-ATM, arising from the fifth Meeting of the Meteorology Panel (METP/5).

3.3 State letter, ref.: AN 2/36-23/6 presented proposals for the amendment of Annex 3, Annex 4, Annex 10 (Vol. II and III), Annex 15, PANS-ABC, PANS-AIM, and the first edition of PANS-IM, arising from the Information Management Panel (IMP).

3.4 The proposed amendments presented in the State letters were envisaged for applicability on 28 November 2024 or, for proposed amendments related to quantitative volcanic ash information, on 27 November 2025.

3.5 State letter Ref.: AN 10/1-23/1 sets out details on the development of the restructured Annex 3 and the new PANS-MET and the amendments related to the following:

a) space weather information services;
b) quantitative volcanic ash concentration information;
c) the international airways volcano watch (IAVW);
d) the ICAO meteorological information exchange model (IWXXM);
e) the world area forecast system (WAFS); and
f) improved definition of meteorological authority and introduction of a new definition of meteorological service provider.

3.6 State letter Ref.: AN 2/36-23/6 sets out, among other proposals, details on the proposed amendment to Annex 3 concerning system-wide information management (SWIM) and a first edition of PANS-IM concerning aeronautical information management, SWIM and information security.

3.7 Background information and details of the proposals for the amendment of Annex 3 are provided in Attachments A to C of the State letter Ref.: AN 10/1-23/1 and Attachments A and H of the State letter Ref.: AN 2/36-23/6.

3.8 The Meeting noted that the proposals might require States, operators and service providers in the aviation system to implement significant changes, including the following:

- The transfer of the means of compliance for SARPs in Annex 3 into a separate PANS-MET;
- Increase the responsibility of the State's designated meteorological authority to include providing oversight and regulation of the meteorological service;
- Provide forecasts of quantitative volcanic ash concentration information;
- Provide the volcano observatory notice for aviation (VONA); and

- Provide meteorological information to users[‡] through information services (SWIM).

3.9 The Meeting was reminded that Initial Proposal 1 in Attachments B and C simply referred to the proposed restructured Annex 3 and new PANS-MET – with no new or changed provisions included. Initial Proposals 2-6 then build upon Initial Proposal 1 to introduce changes to the Standards and Recommended Practices (SARPs).

3.10 To help inform the APAC States on the proposed new provisions for quantitative volcanic ash concentration information, the Meeting invited the VAACs Darwin, Tokyo and Wellington to present explanatory information to the MET SG. [**ACTION MET/S WG 13 – 02**]

3.11 Concerning the proposals for amendment to Annex 3 concerning SWIM, the Meeting was informed that the METP was considering the removal of Annex 3 requirements for global exchange of MET information in the traditional alpha-numeric code form in 2029.

3.12 The Meeting was also informed that the proposed changes to the World Meteorological Organization qualification and competency requirements relating to Aeronautical Meteorological Forecasters and Aeronautical Meteorological Observers is available at the following website: https://community.wmo.int/en/activity-areas/aviation/resources/amp-qual-comp-amendments.

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[‡] Users including: operators, flight crew members, air traffic services units, search and rescue services units, airport managements and others concerned with the conduct or development of international air navigation

REPORT ON AGENDA ITEMS – MET/S WG/13

1. Organizational matters

WP/01 – Provisional Agenda (Secretariat)

1.1 The Meeting adopted the agenda as listed below:

Conjoint session of MET/IE WG/21 and MET/S WG/13 (29 March 2023)
Agenda Item 1: Volcanic ash advisory centre (VAAC) backup tests
Agenda Item 2: SIGMET tests

MET/S WG/13 (29-31 March 2023)
Agenda Item 1: Organizational matters
Agenda Item 2: Review of follow-up from previous meetings
Agenda Item 3: Planning and implementation of meteorological services
Agenda Item 4: Quality management of meteorological services
Agenda Item 5: Deficiencies in the provision of meteorological services
Agenda Item 6: Guidance and education related to the provision of meteorological services
Agenda Item 7: Future work programme and terms of reference
Agenda Item 8: Any other business
Agenda Item 9: Next Meeting

2. Review of follow-up from previous meetings

WP/02 – FOLLOW-UP ACTION FROM MET/S WG/12 (Secretariat)

2.1 The Meeting reviewed and updated the List of Actions as recorded by MET/S WG/12, which included unresolved actions from previous MET/S WG meetings, as presented in **Appendix A** of this Report.

2.2 The Meeting was pleased to consider one (1) action item was completed and eight (8) closed (due to the action being integrated into the work plan or superseded by other activities).

2.3 In addition, the Secretariat reported the recent completion of one amendment to the ICAO APAC Air Navigation Plan (ANP) concerning Table MET II-2 (originated by New Zealand) and expected to complete unresolved ANP-amendment action items prior to MET SG/27, including MET/S WG/12 action items 03 and 04, and MET/S WG/10 action item 21.

WP/03 – FOLLOW-UP ACTION FROM MET SG/26 (Secretariat)

2.4 MET SG/26 adopted the 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*, based on the Draft Conclusion MET/S WG/12/01 – *Updating the online repository on SIGMET Coordination and the consolidation document on SIGMET Coordination Practices in the APAC region*, formulated by MET/S WG/12, and updated information provided by the ad hoc group on the online repository and consolidation document (ref: MET SG/26, WP/15).

2.5 In addition, MET SG/26 adopted the Decision MET SG/26/01 – *Updates to Regional SIGMET Guide*, approving the updates provided by the designated ad hoc group (ref: MET SG/26, WP/09).

2.6 The Meeting noted that, as a follow-up to the above Conclusion and Decision, the Online repository for APAC SIGMET Coordination activities and APAC Regional SIGMET Guide, Tenth Edition — October 2022, published on the ICAO APAC website at: https://www.icao.int/APAC/Pages/eDocs.aspx.

WP/04 – FOLLOW-UP ACTION FROM APANPIRG/33 (Secretariat)

2.7 The Thirty-third Meeting of the Asia and Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG/33) adopted three (3) Conclusions of direct relevance to the work plan of the MET SG and MET/S WG:

- Conclusion 33/12 – WAFS, SADIS and WIFS upgrades;
- Conclusion 33/13 – 0.25-degree WAFS hazard data; and
- Conclusion 33/14 – Update of Information in APANPIRG Air Navigation Deficiencies Reporting Form.

2.8 The Meeting noted that, with the adoption of Conclusion 33/14, APANPIRG/33 agreed to remove the air navigation deficiency AP-MET-23, concerning the lack of SIGMET issued for the Honiara FIR, from the air navigation deficiencies Open list. The Meeting then congratulated Solomon Islands (not present in the Meeting) for this achievement.

2.9 The Meeting noted that the APANPIRG/33 Conclusions 33/12 and 33/13 were adopted from the Draft Conclusions MET SG/26/03 and MET SG/26/04. Furthermore, the Meeting recalled the November 2023 and 2024 timeframe for States to make necessary changes for the WAFS-related upgrades in Conclusions 33/12 and 33/13, particularly the discontinuation of 1.25-degree hazard data in November 2023.

2.10 Given the above, the Meeting highlighted the urgency for completing the Secretariat follow-up action on the State letter urging States to take recommended action on APANPIRG/33 Conclusions 33/12 and 33/13.

2.11 Furthermore, the Meeting highlighted the urgency for ICAO to arrange additional assistance, such as the advertised Aviation Meteorology Officer secondment from the States, to provide adequate Secretariat support for progressing the MET/S WG actions.

3. Planning and implementation of meteorological services

IP/02 – PROVISION OF THREE-HOURLY TAF FOR VHHH (Hong Kong, China)

3.1 The Meeting noted Hong Kong, China had increased the frequency of issuing TAF for the Hong Kong International Airport (VHHH) from once every six hours to once every three hours since 03Z of 8 September 2022. The additional TAF updates could provide more timely and accurate weather forecasts for better flight planning and air traffic control. Positive feedback from pilots and stakeholders has been received since the launch of the three-hourly update of TAF.

WP/10 – PROGRESS OF THE AD HOC GROUP ON SIGMET COORDINATION (Ad hoc group)

3.2 The Meeting noted the work progress of the ad hoc group on SIGMET Coordination, which consists of China, Fiji, India, Indonesia, Malaysia, Thailand, Vietnam and IFALPA as group members and Hong Kong China, Japan and Singapore as the joint rapporteurs.

3.3 The Meeting noted the updates on the online repository of the SIGMET Coordination activities, and as compared with last year, 20 FIRs were establishing additional SIGMET Coordination. States/Administrations were invited to provide updates when necessary.

3.4 The Meeting also noted the enrichment in content in the document on Cases of SIGMET Coordination practices in the APAC Region since last year and encouraged further input from States which could be made at any time by emailing the ad hoc group joint rapporteurs. The Meeting agreed to formulate the following Draft Conclusion:

Draft Conclusion MET/S WG/13-01: ***PUBLICATION AND FURTHER DEVELOPMENT OF THE DOCUMENT ON CASES OF SIGMET COORDINATION PRACTICES IN THE APAC REGION***
That, the MET SG approves publishing the document on Cases of SIGMET Coordination Practices in the APAC Region on the ICAO APAC Office website as a living document and States are invited to provide further input to facilitate more efficient and better coordinated SIGMET service to meet aviation 'users' expectations and operational requirements in the Region.

IP/03 – SIGMET COORDINATION UPDATES IN INDONESIA (Indonesia)

3.5 Indonesia provided updates on SIGMET Coordination activities carried out by Jakarta and Ujung Pandang MWO with the directly adjacent FIR area.

3.6 The Meeting congratulated Indonesia on the extensive work carried out to ensure coordination with their neighboring MWOs and was pleased to see the intention to initiate coordination with MWO Port Moresby.

IP/04 – UPDATE ON THE SOUTH AND SOUTH-EASTERN ASIA SIGMET COORDINATION PROJECT (Hong Kong China, India, Indonesia, Nepal and Sri Lanka)

3.7 The Meeting noted the progress and updates of the South and South-eastern Asia SIGMET Coordination project. The SIGMET coordination between the four MWOs of India and other neighboring MWOs in the group, namely Colombo and Jakarta, transitioned to operational status on 24 October 2022. Nepal also joined the coordination group as a trial member in October 2022. The Project has expanded to seven flight information regions (FIRs) in South and South-eastern Asia. 236 SIGMET coordination cases were conducted under the Project in the three years since the Project commenced.

3.8 The Meeting was pleased to see the inclusion of Nepal in the coordination group, supporting the continual improvement of their SIGMET service and the plans for their deficiency resolution.

IP/05 – SIGMET COORDINATION WORK BETWEEN THE PEOPLE'S REPUBLIC OF CHINA AND THE REPUBLIC OF KAZAKHSTAN (China and Kazakhstan)

3.9 This paper presented the progress of SIGMET Coordination between the People's Republic of China and the Republic of Kazakhstan.

IP/06 – ACHIEVEMENTS AND FUTURE PLANS OF THE PILOT PROJECT ON SIGMET COORDINATION BETWEEN THE REPUBLIC OF KOREA AND THE PEOPLE'S REPUBLIC OF CHINA (Republic of Korea and China)

3.10 This paper outlined the commencement, progress, achievements, and plans of the Pilot Project on SIGMET Coordination between the Republic of Korea and the People's Republic of China.

WP/14 – SIGMET ISSUANCE FOR CONVECTIVE SYSTEMS OVER MULTIPLE FIRS (Japan)

3.11 The Meeting noted discussions from the Collaborative SIGMET Issuance (CSI) Project[§] on coordinating SIGMET with neighbouring MWOs when a thunderstorm extends across flight information region (FIR) boundaries.

3.12 The CSI Project members identified the following two potential comprehensive solutions to facilitate the issuance of harmonized SIGMET:

a) Special criteria for areas near FIR boundaries; and
b) Issuance of single SIGMETs for whole convective systems on behalf of all the MWOs concerned (when part of the system is larger/smaller than a certain proportion).

3.13 The Meeting noted that option b) above would not conform to Annex 3, which does not include provisions for a SIGMET message to cover more than one FIR.

3.14 In addition, the Meeting noted Annex 3 requires that an MWO whose area of responsibility encompasses more than one FIR shall issue separate SIGMET messages for each FIR within its area of responsibility.

3.15 Furthermore, one State (Australia), whose MWO is responsible for two FIRs, informed the Meeting that when a thunderstorm extends across the FIR boundaries, the MWO issues a SIGMET containing the same information on the areas and flight levels affected for each FIR.

3.16 The Meeting also discussed as a potential third solution, that when considering the size of hazardous phenomena, rather than just focusing on the geographic size within their FIR, States should consider the size of the entire phenomena, to ensure the risk to aviation is considered when deciding whether to issue a SIGMET. Other factors such as intensity, movement and cloud tops may also need to be considered.

3.17 The Meeting noted the importance of communication and information exchange between neighbouring MWOs in different coordination projects to facilitate the issuance of harmonized SIGMETs while adhering to the Annex 3 requirements.

3.18 The Meeting encouraged members to share information on their practices with the CSI Project (a survey was available) and requested the CSI Project members to keep the MET/S WG informed of any developments.

4. Quality management of meteorological services

WP/05 – QMS UPDATES FROM SOLOMON ISLANDS AND OTHER PACIFIC ISLANDS STATES (Solomon Islands)

[§] Conducted by the Japan Meteorological Agency (JMA), Department of Meteorology and Hydrology of Lao PDR (LDMH), Department of Meteorology and Hydrology of Myanmar (MDMH), Philippine Atmospheric Geophysical and Astronomical Services Administration (PAGASA), Thai Meteorological Department (TMD) and Vietnam Air Traffic Management Corporation (VATM).

4.1 The Meeting noted progress by Solomon Islands and other Pacific Island States on implementing a quality management system (QMS) for MET information. A survey of those States showed that the Solomon Islands and Fiji MET service providers had implemented QMS, and Kiribati had partly implemented QMS, including internal and external audits and assigned full-time staff. However, Papua New Guinea had not implemented QMS. All the States indicated a need for training on QMS.

IP/07 – QUALITY MANAGEMENT SYSTEM FOR AVIATION WEATHER SERVICES IN HONG KONG, CHINA (Hong Kong, China)

4.2 The Meeting noted the Hong Kong Observatory's experience obtaining ISO 9000 certification for implementing a quality management system for the Airport Meteorological Office in 2002 and its subsequent improvements in response to changing regulatory requirements and user expectations over the past two decades.

IP/08 – IMPLEMENTATION OF QMS IN AERONAUTICAL METEOROLOGY SERVICE IN INDONESIA (Indonesia)

4.3 This paper presented an overview of QMS implementation in aeronautical meteorology services in Indonesia, including the practices, status, benefits, and plans.

IP/10 – PROGRAM OF COMPETENCY QUALIFICATION AND COMPETENCY-BASED TRAINING FOR AERONAUTICAL METEOROLOGICAL PERSONNEL IN VIETNAM (Vietnam)

4.4 This paper presented the new version (2021) of the competency assessment program and consequent competency-based training decision and the three-year MET CAS program 2022-2025 for aeronautical forecasters and observers in Vietnam. The program helps improve the professional and practical qualification of aeronautical meteorological personnel and contribute to improving the quality of meteorological services for aviation.

5. Deficiencies in the provision of meteorological services

WP/06 – REVIEW OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD (Secretariat)

5.1. As endorsed by APANPIRG/33, the current list of air navigation deficiencies contains twelve (12) open deficiencies in the MET field (a copy is provided in **Appendix C** of this Report). The MET deficiencies are related to facilities and services in seven (7) APAC States, as listed in **Table 1** below:

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

MET facilities and services	Asia/Pacific States	Def. ID	Status
Aerodrome meteorological observations or reports	Kiribati Nauru	AP-MET-02 AP-MET-21	open open
Meteorological watch office (MWO) or SIGMET information	Democratic Peoples' Republic of Korea Nauru Nepal Papua New Guinea Papua New Guinea	AP-MET-16 AP-MET-24 AP-MET-14 AP-MET-08 AP-MET-22	open open open open open
Volcanic ash/activity information	Papua New Guinea	AP-MET-04	open

	Tonga	AP-MET-17	open
WAFS forecasts or flight briefings	Kiribati Nauru Solomon Islands	AP-MET-18 AP-MET-19 AP-MET-20	open open open

5.2. Regarding the open MET deficiencies, the Meeting was informed that the designated ad hoc group on air navigation deficiencies had noted significant progress towards rectifying the deficiencies AP-MET-02, -17 and -04 by Kiribati, Tonga and Papua New Guinea.

WP/07 – RESOLUTION OF MET DEFICIENCY AP-MET-14 (Nepal) and FLIMSY/01 – STATISTICS OF SIGMET ISSUANCE OF NEPAL (Hong Kong, China)

5.3. The Meeting congratulated Nepal (not present in the Meeting) on its progress towards rectifying the APANPIRG air navigation deficiency AP-MET-14 concerning issuing and disseminating SIGMET information for Kathmandu FIR.

5.4. The Meeting noted that Nepal had implemented systems to prepare and disseminate SIGMET messages in the format provided in Annex 3, Table A6-1A, *Template for SIGMET and AIRMET messages*.

5.5. The Meeting noted that from January 2022 to February 2023, 490 SIGMETs were issued by VNKT and received by Hong Kong, with 444 WS SIGMETs and 44 cancelled SIGMETs. Kathmandu also participated in the APAC Regional SIGMET tests held in November 2022.

5.6. In addition, Nepal had coordinated SIGMET with neighbouring MWOs under the SSEA SIGMET Coordination Project (reported in IP/04) to ensure the provision of harmonized SIGMET.

5.7. The Meeting also noted that, although Nepal had upgraded its systems to produce SIGMET in the IWXXM format, it was still awaiting upgrading its AMHS, as needed to disseminate the SIGMET in IWXXM format.

5.8. Nepal was also seeking confirmation from ATS, CAAN, and airline operators of its SIGMET information's regular and timely receipt.

5.9. Given the above, the Meeting encouraged the ad hoc group to continue to support Nepal in reporting to ICAO the rectification of the deficiency as stated in AP-MET-14.

6. Guidance and education related to the provision of meteorological services

WP/08 – APAC VOLCEX 22/01 FINDING: EXERCISE INDICATOR INCONSISTENCY IN THE GUIDANCE (Indonesia)

6.1. The volcanic ash exercise, APAC VOLCEX 22/01, organized by BMKG Indonesia and Sri Lanka highlighted the issue of inconsistent guidance on identifying the MET information exchanged for volcanic ash exercises.

6.2. With applicability from 7 November 2019, ICAO Annex 3, Table A2-1, *Template for advisory message for volcanic ash*, and Table A6-1A, *Template for SIGMET and AIRMET messages*, has enabled States to use the status indicator EXER to indicate that an exercise is taking place and the message may contain information that should not be used operationally.

6.3. However, the relevant guidance in the Handbook on the IAVW (ICAO Doc 9766-AN/968) and the ICAO APAC Regional SIGMET Guide, Seventh Edition — October 2019, did not reflect the guidance in Annex 3 (above). As a result, there was inconsistency in the use of exercise indicators among different exercise messages; however, these differences did not cause substantial problems to the exercise nor interrupt the actual operations.

6.4. The Meeting congratulated Indonesia and Sri Lanka on conducting the exercise and welcomed the feedback highlighting the inconsistency in the guidance material.

6.5. Furthermore, the Meeting was encouraged, to be informed that an update to the Doc 9766 – Handbook on the International Airways Volcano Watch (IAVW), was due to be published in approx. 3 months, which would address the issue identified above and realign the guidance on exercise messages with Annex 3. The Meeting requested the Secretariat to share information on the update of the IAVW Handbook at MET SG/27. [**ACTION MET/S WG 13 – 03**]

6.6. In addition, the Meeting recalled that the latest version of the APAC Regional SIGMET Guide, Tenth Edition — October 2022, is also aligned with Annex 3 on using TEST or EXER to indicate test or exercise messages.

WP/09 – UPDATES TO REGIONAL SIGMET GUIDE (Australia)

6.7. Updates prepared by the designated ad hoc group were endorsed at the MET SG/26 meeting for inclusion and publishing in the tenth edition of the SIGMET Guide (ref: Decision MET SG/26/01). The updates include a change of the location indicator for FIR Port Moresby to AYPM to align with ICAO Doc 7910/186 Location Indicators (ref: MET SG action 26/05).

6.8. Several planned changes for the next version of the SIGMET Guide include:

- Add VAAC Darwin/VAAC Wellington backup procedures;
- Review of VAAC backup procedures;
- Guidance on SIGMET for volcanic ash crossing FIR boundaries; and
- Alignment of APAC and EUR SIGMET Guides

6.9. The Meeting noted that ad hoc group members and rapporteur Elizabeth Heba and Domenic Panuccio had moved on to other roles. However, the Meeting acknowledged their contributions and leadership in the ad hoc group's work.

6.10. The following MET/S WG members remained or joined the ad hoc group:

- David House (Australia)
- Christy Leung (Hong Kong, China)
- Chan Ho Sun (Hong Kong, China)
- Michiko Ikeda (Japan)
- Goh Wee Poh (Singapore) - Rapporteur
- Chiam Keng Oon (Singapore)
- Mr. Dang Duc Anh (Vietnam)
- Mr. Le Quang Hung (Vietnam)

WP/11 – SPACE WEATHER EXERCISE AND EDUCATION (Australia)

6.11. Australia (Bureau of Meteorology), supported by New Zealand (Civil Aviation Authority), conducted space weather exercises in October 2022. The exercises focussed on the space weather impacts on HF communication (HF COM).

6.12. Australia and New Zealand plan to conduct another space weather exercise by the end of 2023, focusing on the impact of space weather on GNSS. The exercise would include two sessions:

- Session 1: Educational focus (optional – intended for those who did not attend the first exercise)
    - what space weather is and how it might affect aviation;
    - how the space weather advisory system works; and
    - what information the space weather advisories will contain, and how they are made available.
- Session 2: Issuance and evaluation of receipt of a GNSS Exercise (EXER) SWXA
    - an evaluation of the participant's receipt of EXER SWXA;
    - working through a GNSS event exercise in a collaborative format; and
    - discuss any issues, improvements and resulting recommendations.

6.13. The exercise is proposed to include participants from airlines, air traffic services, the ICAO regional office, meteorological service providers and the Australian Space Weather Centre.

6.14. The Meeting requested the attendees be expanded to include any APAC State. Australia agreed that the first session, covering education could be expanded to include APAC States, but further consideration was required about the scope of attendees at the second session (exercise).

6.15. Australia also provided the following an outline of the proposed Space Weather (SWX) Seminar and sought feedback from members.

- What is SWX and the solar cycle
- SWX impacts on aviation (HF Com, GNSS, Satellite Com and Radiation)
- ICAO SWX Advisory (SWXA) system overview
- Content of SWXA
- How are SWXA disseminated
- SWX Education Materials

6.16. It was agreed that the Secretariat would coordinate with Australia and New Zealand to incorporate the ICAO input into the exercise, as agreed by MET SG/25 (ref: action item 25/13).

6.17. The paper also recalled discussion from MET/S WG/12 on an ad hoc group to investigate further opportunities for educating users on the ICAO SWX service (e.g., education material or activities) (ref: MET/S WG/12 action item 05). Finally, the paper invited the Meeting to consider formulating a Draft Conclusion for MET SG to create a space weather exercise steering-group to develop educational materials and conduct exercises.

6.18. Given the broader discussion in the Meeting on the future work plan, the Meeting deferred a decision on the proposal above until agenda item 7.

IP/09 – COMBINED APAC VAAC MANAGEMENT REPORT (Australia, Japan and New Zealand)

6.19. This paper presented an International Airways Volcano Watch (IAVW) focused management report describing activities for the three APAC Volcanic Ash Advisory Centres (VAAC), Darwin, Tokyo, and Wellington, covering 1 January 2022 to 31 December 2022.

6.20. The Meeting agreed the combined VAAC management report was useful and looked forward to the inclusion of information on other VAAC activities in future years.

7. Future work program and terms of reference

WP/12 – REVIEW MET/S WG WORK PROGRAM AND TERMS OF REFERENCE (Secretariat)

7.1. The Meeting reviewed the MET/S WG terms of reference and work plan document in **Appendix B** of this Report.

7.2. Following the Chair's request to consider conducting the WG activities by virtual rather than in-person meetings, to further progress the activities of the working group and to facilitate participation – where possible – by members who are unable to travel to in-person meetings. The Meeting further noted the benefits from in-person meetings. However, the Meeting also discussed that seminars in virtual mode can have broader attendance of participants from more States/Administrations and from different aviation communities.

7.3. Given the above, the Meeting developed the following Draft Conclusions for consideration by the MET SG:

Draft Conclusion MET/S WG/13-02 – DISESTABLISHMENT OF THE VOLCEX SG AND PROPOSED MET EXERCISE PLANNING	
What: That, the MET SG approves the disestablishment of the VOLCEX Steering Group and instead includes in its work plan the establishment of ad hoc groups to undertake specific exercises on either volcanic ash or space weather scenarios, reporting back under a new MET SG agenda item for MET exercises. Further, States are encouraged to report under this agenda item on activities within their own countries on aviation focused MET exercises.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒Economic ☒ Environmental ☒ Ops/Technical
Why: There is a need for the conducting of space weather exercises, however given that the VOLCEX Steering Group has been unable to find a new chair to continue leading the work of the group and so it is not considered appropriate to expand the remit of the VOLCEX SG. Instead, it would be more valuable to create ad hoc groups to plan specific exercises focused on both volcanic ash and space weather scenarios and to report back to the MET SG (and any other interested APANPIRG WG) on their results. Further, by creating an agenda item on MET exercises, States can share any lessons learnt from exercises conducted within their own countries.	Follow-up: ☐Required from States
When: September 2023	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: ROs	

Draft Conclusion MET/S WG/13-03 – METEOROLOGICAL SEMINARS

What: That, MET SG coordinate the provision of meteorological seminars, covering topics related to ICAO changes, new procedures and policies, future services and information exchange to support States implementing ICAO Annex 3 requirements and education.	Expected impact: ☐ Political / Global ☐ Inter-regional ☒Economic ☒Environmental ☒ Ops/Technical
Why: Currently only a subset of APAC States attend ICAO meteorological related meetings. Attendance (virtually) at ICAO meetings during COVID demonstrated that there is significant demand from States for further information. Attendance at ICAO meetings comes at an environmental and financial cost. The provision of Meteorological Seminars will enable a wider group of stakeholders, from more States, to receive advice and stay informed of the latest ICAO developments, offering both financial and environmental benefits.	Follow-up: ☐Required from States
When: September 2023	Status: Adopted by Subgroup
Who: ☐Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☐Other: ROs	

7.4. The meeting further requested the Chair MET/S WG, in coordination with the Chair MET/IE WG, to develop a proposal for the MET/S WG work plan, balancing the advantages of virtual and in-person activities and to consider the role of VOLCEX SG going forward to be presented at a virtual meeting of the MET/S WG members before MET SG/27. [**ACTION MET/S WG 13 – 04**]

8. Any other business

8.1. No discussion under this item.

9. Next Meeting

9.1. Following the MET/IE WG/21 proposals, the Meeting proposed the following (tentative) dates for the next Meeting of the MET/S WG:

- 20-22 March 2024 (potentially aligned with MET/IE WG)

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MET/S WG/13
Appendix A to the Report
LIST OF ACTIONS

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

New action items recorded by MET/S WG/13

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
MET/S WG/13 **01**	Ensure that the APAC Regional SIGMET Guide be updated to include MWO Ulaan Baatar in the MWO list and to include the additional headers used by MWO Tahiti for their SIGMETs. [Ref: MET/IE WG/21 and MET/S WG/13 Conjoint Session Report, para 2.13]	MET SG/27	Secretariat and Chair in coordination with the ad hoc group on the APAC Regional SIGMET Guide	**TO COMMENCE**
MET/S WG/13 **02**	Present explanatory information to help inform the APAC States on the proposed new provisions for quantitative volcanic ash concentration information. [Ref: MET/IE WG/21 and MET/S WG/13 Conjoint Session Report, para 3.10]	MET SG/27	VAACs Darwin, Tokyo and Wellington	**TO COMMENCE**
MET/S WG/13 **03**	Share information on the update of the IAVW Handbook (due to be published in approx. 3 months) which would realign the guidance on exercise messages with Annex 3. [Ref: MET/S WG/13 Report, para 6.5]	MET SG/27	Secretariat	**TO COMMENCE**
MET/S WG/13 **04**	Develop a proposal for the MET/S WG work plan, balancing the advantages of virtual and in-person activities and to consider the role of VOLCEX SG going forward to be presented at a virtual meeting of the MET/S WG members before MET SG/27 [Ref: MET/S WG/13 Report, para 7.4]	MET SG/27	Chair MET/S WG, in coordination with the Chair MET/IE WG	**TO COMMENCE**

Unresolved action items recorded by MET/S WG/12

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
MET/S WG/12 **01**	Prepare and disseminate the ICAO letter advising States of SIGMET test deficiencies. *[Ref: Report of Conjoint Session of MET/IE WG/20 and MET/S WG/12, para. 2.25.]*	Before the next SIGMET test	Secretariat, in coordination with the ad hoc group (on AN deficiencies)	**IN PROGRESS**
MET/S WG/12 **02**	Publish the link to the *online repository of SIGMET coordination activities* on the ICAO APAC Office website. *[Ref: Report of MET/S WG/12, para. 3.22.]*	Before MET SG/26	Secretariat	**COMPLETED** https://www.icao.int/APAC/Pages/eDocs.aspx
MET/S WG/12 **03**	Prepare and process proposals for amendment to the ANP and other Regional Guidance to reflect the change in Phnom Penh FIR's location indicator from VDPP to VDPF. *[Ref: Report of MET/S WG/12, para. 3.34.]*	Before MET SG/~~26~~27	Secretariat, in coordination with participants from Cambodia	**IN PROGRESS**
MET/S WG/12 **04**	Prepare and process proposals for amendment to the ANP (Table MET II-1 – Meteorological Watch Offices) and the APAC Regional SIGMET Guide, Appendix D, to reflect the changes in Jakarta and Ujung Pandang FIR's location indicators from WIIZ to WIIF and WAAZ to WAAF, respectively. *[Ref: Report of MET/S WG/12, para. 6.4.]*	Before MET SG/~~26~~27	Secretariat, in coordination with participants from Indonesia	**IN PROGRESS** The ANP amendment is still pending
MET/S WG/12 **05**	Delegate an ad hoc group to investigate further opportunities for educating users on the ICAO SWX service (e.g., education material or activities). *[Ref: Report of MET/S WG/12, para. 6.8.]*	Before MET SG/~~26~~27	Secretariat and Chair	**IN PROGRESS**

Unresolved action items recorded by the conjoint session of MET/IE WG/19 and MET/S WG/11

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
01	State letter request to user States to ensure the relevant operational units participate in the VAAC back-up tests and provide the VAACs with their current, valid AFTN addresses for receipt of the VAA messages.*[Ref: para. 1.1.-1.3., MET/IE WG/19 and MET/S WG/11 conjoint session]*	Before next scheduled test	Australia, New Zealand, Secretariat	**TO COMMENCE**
02	Investigate possible improvements to the template for the SIGMET test summary table to enable a more detailed analysis of the SIGMET tests, including analysis of more than one WC and/or WV SIGMET test message issued by the same MWO (which receives TCA and/or VAA from more than one TCAC and/or VAAC). *[Ref: para. 2.16., MET/IE WG/19 and MET/S WG/11 conjoint session]*	Before next scheduled test	SIGMET test Focal Points, Secretariat	~~**TO COMMENCE**~~ **CLOSED**

Unresolved action items recorded by MET/S WG/11

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/
02	State letter to: a) Inform States of the need to prepare for the proposed WAFS and SADIS changes planned for November 2023; and b) Invite States to inform ICAO of any need for related technical assistance. *[Ref: para. 2.15., MET/S WG/11]*	Before MET SG/~~26~~27	Secretariat	**IN PROGRESS** Ref: Decision MET SG/24-07
04	Continue to develop the proposed guidance for possible inclusion in the APAC Regional SIGMET Guide on SIGMET issuance where volcanic ash is forecast to cross FIR boundaries, taking into consideration the need for input from the end user community and consider global coordination with ICAO regions. *[Ref: para. 6.2.-6.3., MET/S WG/11]*	Before MET SG/~~26~~27	Ad hoc group	**IN PROGRESS**

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

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
	Terms of Reference and Work Program			
01	**Terms of Reference and Work Program – online coordination:** Make use of regular online coordination meetings to facilitate progress on follow-up on the action items in the Task List/s [Ref: para. 2.3. and 7.3.]	As necessary	Secretariat and WG Chairs and members	~~**IN PROGRESS**~~ **CLOSED** Superseded by other activities
	OPMET Monitoring			
07	**OPMET performance indices – States' follow-up:** Inform States concerned of the locations with low performance indices and advise the States to take appropriate corrective actions; address the above communication also the Regional OPMET Centres (ROCs) responsible for the collection of OPMET messages from the originating stations [Ref: para. 3.4. and 3.5.]	Before MET SG/26	Secretariat	~~**IN PROGRESS**~~ ~~Ref: MET/IE WG, 5. Work Plan, Activity 1 and Activity 2~~ **CLOSED** Superseded by other activities
	Regional Guidance Materials			
21	**ANP updates – State Volcano Observatories:** Designate an ad-hoc group consisting of the Secretariat and members from the VAACs and RODBs to identify the APAC States with active or potential active volcanoes, which do not have a designated State volcano observatory listed in the APAC ANP, Vol I, Table MET I-1; conduct the necessary coordination to facilitate the States concerned with the designation of a State volcano observatory and listing it in the APAC ANP; coordinate the action above with the development of a comprehensive proposal for amendment of the ANP to reflect APAC States' current requirements for State volcano observatories [Ref: para. 4.17., 8.3. and 8.4.]	Before MET SG/~~26~~27	MET/S WG and Secretariat	**IN PROGRESS** Amendment of ANP still pending
	SIGMET test			
28	**SIGMET test results – corrective action plan:** Investigate the reason for the reduced reception of SIGMET test messages at Regional OPMET Centre (ROC) London compared to APAC RODB's and share the results with MET/S for potential corrective action [Ref: para. 6.12.]	Before MET SG/26	MET/IE WG	~~**IN PROGRESS**~~ ~~Ref: MET/IE WG, 5. Work Plan, Activity 3~~ ~~AND~~ ~~Ref: MET/S WG, 5. Work Plan, Activity 3~~ **CLOSED** Superseded by other activities
	Other			
30	**VAAC back-up test procedures – review and update:** Refer to the pertinent information from IP/08 and determine appropriate action for the next review and update of the VAAC back-up test procedures [Ref: para. 8.25.]	Before MET SG/~~26~~27	MET/IE WG and MET/S WG	**IN PROGRESS** Ref: MET/IE WG, 5. Work Plan, Activity 4

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILTY	STATUS/ REMARKS
31	**Special air-reports – promoting issuance of:** Continue to coordinate the required follow-up action (outstanding action item no. 8) concerning promoting the issuance of special air-reports; publicise by way of State letter (and/or other channels) the importance of exchanging special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices) [Ref: para. 7.2. and 8.21.]	Before MET SG/26	Secretariat	~~**IN PROGRESS** Ref: Action Item MET/R WG 9/1; Webinar on Special Air-Reports, 17 June 2021~~ **CLOSED** Superseded by other activities
32	**Air navigation deficiencies – resolution of:** Continue to support States, as necessary, such as Nepal, with developing and implementing their corrective action plans for the resolution of air navigation deficiencies [Ref: para. 9.4.]	Before MET SG/26	Secretariat	~~**IN PROGRESS** Ref: MET/S WG, 5. Work Plan, Activity 6~~ **CLOSED** Superseded by other activities
33	**WAFS and SADIS – preparation for proposed changes:** Develop appropriate actions in the work program to facilitate States' awareness of and planning for the proposed (WP/25) WAFS and SADIS changes in November 2023 [Ref: para. 10.5.]	Before MET SG/26	MET/S WG	~~**IN PROGRESS**~~ **CLOSED** Superseded by other activities

Unresolved action items recorded by MET/S WG/09

ACTION ITEM	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/ REMARKS
9/5	Submit a proposal to MET/SG/23 for further review and possible adoption of the proposed update to the Asia/Pacific Regional SIGMET Guide developed by the designated ad-hoc group, incorporating the consequential changes identified by the meeting arising from the following: i. Development of MWO Phnom Penh in Cambodia (MET/IE WG/17 – WP/03, Appendix II, refers); ii. Proposals made by Australia in relation to WV SIGMET (MET/IE WG/17 – MET/ S WG/9 – WP/C4, para. 3.1, (b) and (c), refers); and iii. Introduction of space weather advisory information (MET/IE WG/17 – WP/05, para. 3.1 (c), refers). *[Report of MET/S WG/9, para. 6.8 – 6.9, refers]*	Before MET SG/26	Designated ad-hoc group and Secretariat	~~**IN PROGRESS** Amendment of ANP Vol. II still pending~~ **CLOSED** Superseded by other activities

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TERMS OF REFERENCE AND WORK PROGRAM

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

TERMS OF REFERENCE

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

State or Org. and Name	Title/Organization	Contact information
AUSTRALIA ~~Ms. Elizabeth HEBA~~ Mr David House	~~Aviation Quality Assurance Lead~~ Operational Systems Specialist Australian Bureau of Meteorology GPO Box 1289, Melbourne VIC 3001, AUSTRALIA	~~Tel: +61 3 9669 4313~~ E-mail: ~~elizabeth.heba@bom.gov.au~~ david.house@bom.gov.au
~~**AUSTRALIA**~~ ~~Mr. Domenic PANUCCIO~~	~~Senior Aviation Meteorologist~~ ~~Australian Bureau of Meteorology~~ ~~GPO Box 1289, Melbourne VIC 3001, AUSTRALIA~~	~~Tel: +61 3 9669 4379~~ ~~E-mail:~~ ~~domenic.panuccio@bom.gov.au~~
CHINA Mr. WANG Fengyun	Engineer, MET Office, Air Traffic Management Bureau of East China Shanghai 200335, CHINA	Ph: +86 (21) 2232 7505 Fax: +86 (21) 6268 3667 Em: wangfy@atmb.cn
CHINA Mr. JI Pengfei	Meteorologist, Meteorology Division Air Traffic Management Bureau 12 East Sanhuan Road Middle Chaoyang District Beijing 100022 PEOPLE'S REPUBLIC OF CHINA	Tel: +86 (10) 8778 6033 Fax: +86 (10) 8778 6820 Email: jipengfei@atmb.net.cn
HONG KONG, CHINA Mr. Sai-Tick CHAN	Acting Assistant Director, Hong Kong Observatory, 134A Nathan Road, Tsim Sha Tsui, HONG KONG CHINA	Ph: +852 2926 8232 Fax: +852 2375 2645 Em: stchan@hko.gov.hk
HONG KONG, CHINA Ms. Christy LEUNG Yan-yu	Scientific Officer, Hong Kong Observatory, 134A Nathan Road, Tsim Sha Tsui, HONG KONG CHINA	Ph: +852 2926 5013 Fax: +852 2375 2645 Em: yyleung@hko.gov.hk
INDIA (TBC)		
INDONESIA ~~(TBC)~~ Ms Ashriah Jumi Putri Andani	Aeronautical Meteorological Officer, Agency for Meteorology, climatology, and Geophysics(BMKG), Jl. Angkasa 1 no.2, Kemayoran, Jakarta Pusat, 10720, Jakarta, Indonesia	Phone: +6289693477303 Email: ashriah.andani@bmkg.go.id
JAPAN Ms. Erika HAYAMI	Senior Coordinator for International Aeronautical Meteorology Planning Division, Administration Department, Japan Meteorological Agency (JMA) 3-6-9 Toranomon, Minato City, Tokyo 105-8431, JAPAN	E-mail: e-hayami@met.kishou.go.jp
JAPAN Ms. Michiko Ikeda	Scientific Officer, Office of Aviation Weather Forecasting Forecast Division, Forecast Department, Japan Meteorological Agency (JMA), 1-3-4 Otemachi, Chiyoda-ku, Tokyo 1008122	Tel: +81 3 3212 8341 (ex. 3524) Fax: +81 3 3212 8377 Email: michi-ikeda@met.kishou.go.jp
~~**JAPAN**~~ ~~MATSUURA Yuu (Mr)~~	~~Assistant Scientific Officer, Office of Aeronautical Meteorology, Planning Division, Administration Department, Japan Meteorological Agency (JMA)~~	~~E-mail:~~ ~~yuu_matsuura@met.kishou.go.jp~~
MALAYSIA Mr. Mr. Muhammad Helmi bin Abdullah	Senior Director, National Meteorological Aviation Centre, Kuala Lumpur International Airport, 1st Floor, Airport Management Centre, 64000 Sepang Selangor Darul Ehsan, MALAYSIA	Ph: +603 8787 2360 Fax: +603 8787 1019 Email: helmi@met.gov.my
MALDIVES Mr. Ali SHAREEF	Deputy Director General, Maldives Meteorological Service, Hulhule, 22000 MALDIVES	Ph: +960 332 6200 Fax: +960 334 1797, 332 0021 Em: ali.shareef@met.gov.mv
NEW ZEALAND **(Chair)** Ms Paula ACETHORP	Chief Meteorological Officer Civil Aviation Authority of New Zealand P.O. Box 3555, Wellington 6140 NEW ZEALAND	Ph: +64 4 830 2611 Em: paula.acethorp@caa.govt.nz
REPUBLIC OF KOREA Ms. Ka-Young Byen	Assistant Director, Aviation Meteorological Office (AMO) of Korea Meteorological Administration (KMA) 272 Gonghang-ro, Jung-gu, Incheon, REPUBLIC OF KOREA 22382	Tel: +82 (32) 740 2855 Fax: +82 (32) 740 2817 E-mail: bky2012@korea.kr

TERMS OF REFERENCE AND WORK PROGRAM

1. MEMBERSHIP – The MET/S WG comprises experts provided by States, International Organizations and bodies and organizations having experience in the provision of aeronautical meteorological services.		
State or Org. and Name	**Title/Organization**	**Contact information**
PHILIPPINES ~~(TBC)~~ Ms. Hannagrace Cristi	~~(TBC)~~ Assistant Weather Services Chief Philippines Atmospheric, Geophysical and Astronomical Services Administration Civil Aviation Authority of the Philippines	~~(TBC)~~ E-mail: hannagrace.cristi@pagasa.dost.gov.ph; hannacristi@yahoo.com
SINGAPORE ~~Mr.~~ **~~Cheong~~** ~~Wee Kiong~~ Mr. **Goh** Wee Poh	~~Deputy Director (Forecast Operations Department)~~ Head, Customer Services, Meteorological Service Singapore, P.O. Box 8, Singapore Changi Airport, Singapore 918141 SINGAPORE	Tel: +65 ~~6545 7196~~ 6542 9224 Fax: +65 6542 5026 Email: ~~cheong_wee_kiong@nea.gov.sg~~ goh_wee_poh@nea.gov.sg
SINGAPORE ~~Mr.~~ **~~Tham~~** ~~Yap Fung~~ Mr. **Chiam** Keng Oon	~~Executive~~ Senior Meteorologist, Meteorological Service Singapore, P.O. Box 8, Singapore Changi Airport, Singapore 918141 SINGAPORE	Tel: +65 ~~6542 5059~~ 6244 6133 Fax: +65 6542 5026 Email: ~~tham_yap_fung@nea.gov.sg~~ chiam_keng_oon@nea.gov.sg
THAILAND Ms Rassmee Damrongkietwattana	Director, Aeronautical Weather Monitoring Sub-Division, Aeronautical Meteorology Division, Thai Meteorological Department, 6th Floor, ATC Complex Suvarnabhumi International Airport Bang Pli, Samut Prakarn, 10540 THAILAND	Ph: +66 (2) 1340011 Ext 213 Fax: +66 (2) 1340009 +66 (2) 1340010 Em: rassmee@hotmail.com
UNITED STATES ~~Mr. Pat MURPHY~~	~~Federal Aviation Administration, Senior Meteorologist, Programmeme Lead International, FAA Headquarters, 800 Independence Ave, S.W., Washington, D.C. 20591 UNITED STATES~~	~~Tel: +1 (202) 267 2788~~ ~~Email: michael.murphy@faa.gov~~
VIETNAM Ms. Lan Oanh Nguyen (Lana)	Deputy Director, Air Navigation Department, Civil Aviation Authority of Vietnam, 119 Nguyen Son street, Long Bien district, Hanoi, VIET NAM	Ph: Fax: Email: lanoanh@caa.gov.vn
ICAO (Secretariat) Mr. Peter DUNDA	Regional Officer Aeronautical Meteorology/Environment International Civil Aviation Organization 252/1 Vibhavadi Rangsit Road Chatuchak, THAILAND	Ph: +66 (2) 537-8189 Ext. 153 Fax: +66 (2) 537-8199 Email: pdunda@icao.int

2. DESCRIPTION	
Objective	Improve the availability, timeliness and quality of meteorological services, in particular, observations, forecasts, advisories and warnings, and facilitate the implementation of new meteorological services in support of the global air navigation plan framework and the aviation system block upgrade (ASBUs) methodology.
Benefits	Improve the safety and efficiency of flight and ground operations.
Functions of the group	Under guidance from ICAO APAC MET Secretariat: a) Promote the implementation of meteorological services, in particular, observations, forecasts, advisories and warnings, in support of the aviation system block upgrades (ASBUs), System Wide Information Management (SWIM), MET support to Air Traffic Management, etc.; b) Promote the requirement for, and benefits of, QMS for MET services and competency of aeronautical meteorological personnel; c) Maintain awareness of and identify new meteorological deficiencies and formulate strategies to resolve these deficiencies; d) Continually seek ways to improve the quality, compliance against SARPs and operational effectiveness of the meteorological services; Monitor the implementation and use of products and services under the framework of the World Area Forecast System (WAFS), the International Airway Volcano Watch (IAVW) and the International Tropical Cyclone Watch (ITCW); e) Monitor the relevant activities of the MET Panel and appropriate bodies; f) Monitor the relevant activities of VOLCEX/SG; and g) Provide advice and report to the MET Sub-group on the above issues for further coordination through the ICAO Secretariat with other appropriate bodies.
Work Programme	The work to be addressed by the ASIA/PAC MET/S WG includes: • Review procedures for the issuance of meteorological observations, forecasts, advisories and warnings in the region and propose actions for their improvement to related performance objectives; • In conjunction with MET/IE WG, investigate the deficiencies in the format and dissemination of meteorological observations, forecasts, advisories and warnings and propose remediation plans; • Respond to the needs of the guidance and training related to the implementation of meteorological observations, forecasts, advisories and warnings and inform MET/IE WG of changes required to the SIGMET guide;

2. DESCRIPTION	
	• In conjunction with MET/R WG and to support the ASBUs, provide meteorological input for operational planning for specific phenomena, including volcanic ash cloud, radioactive cloud, tropical cyclone, tsunami and space weather; • Follow the developments in the States related to the improvement of meteorological observations, forecasts, advisories and warnings and provide regional input on these matters to relevant ICAO and WMO groups and gather user requirements from ANSPs, IATA, IFATCA and IFALPA; • Investigate options for rectification of air navigation deficiencies in the field of meteorological services in the APAC States; • Provide support for the ICAO APAC volcanic ash exercises; • Report on its work to the MET Sub-group of APANPIRG; and • Maintain a link to the Regional ATM Contingency Plan through the ATM SG.

3. COMMUNICATION STRATEGIES				
Description	**Target Audience**	**Delivery Method**	**Frequency/ Date**	**Responsibility**
Interim Work Programme Progress Report	MET/S WG Members	Email and web-conference	Quarterly/as determined by Chair	Chair and Secretariat
MET Chairs Coordination Meeting	Chairs of MET SG and its contributory working groups	Web-conference E-mail	Quarterly	Chair and Secretariat
Major Work Programme Progress Report	MET/S WG Members	Working Paper (MET/S WG meeting)	Annually/published 14-days or more before the meeting	Chair and Secretariat
General correspondence	MET/S WG Members	Email	As required	MET/S WG Members
New, specific proposal for action (WP)	MET/S WG Meeting	Working Paper (MET/S WG meeting)	Annually/submitted 28-days or more before the meeting (published 14-days or more before the meeting)	MET/S WG Members or States
New, specific information (IP)	MET/S WG Meeting	Information Paper (MET/S WG meeting)	Annually/submitted 28-days or more before the meeting (published 14-days or more before the meeting)	MET/S WG Members or States
Working Group Meeting Report	MET/S WG Members and all APAC States	MET/S WG Meeting Report	Annually/published 21-days or less after the meeting	Chair and Secretariat
Working Group Progress Report	MET SG Meeting	Working Paper (MET SG meeting)	Annually/submitted 28-days or more before the meeting (published 14-days or more before the meeting)	Chair and Secretariat

WORK PROGRAM

Activity	**Time Frame**	**Responsibility**	**Status**
Activity 1: Monitor and provide assistance to the regional implementation of meteorological observations, forecasts, warnings and advisories	Ongoing	MET/S WG	In progress
Activity 2: Track and investigate deficiencies in the format and dissemination of meteorological observations, forecasts, warnings and advisories and propose corrective action and provide information to ICAO and WMO groups for possible assistance	Ongoing	MET/S WG and MET/IE WG	In progress
Activity 3: Review WC, WV & WS SIGMET test results and implement improvements.	Ongoing	MET/S WG	In progress
Activity 4: Provide guidance and/or training related to the implementation of meteorological observations, forecasts, warnings and advisories, including input to the Regional SIGMET Guide as they relate to the Annex 3 amendment cycle and SIGMET tests.	Ongoing	R/O, MET/S WG and MET/IE WG	In progress
Activity 5: Provide input into regional-operational plans as required for specific phenomenon, including VA, radioactive cloud, TC, Tsunami and Space Weather, with consideration to global ICAO groups and WMO developments.	Ongoing	MET/S WG and MET/R WG	In progress
Activity 6: Investigate, and implement as appropriate, options to assist States in resolving air navigation deficiencies in the field of meteorological service.	Ongoing	MET/S WG	In progress
Activity 7: Cost recovery – assist the PMC with development of an effective cost recovery strategy for the Pacific SIDS.	2023-2024	MET/S WG	To commence
Activity 8: SIGMET coordination	2023-2026	MET/S WG	In progress

5. WORK PLAN				
Activity / Milestone	**Accountability**	**Predecessors**	**Date**	**Status**
Activity 1: Monitor and provide assistance to the regional implementation of meteorological observations, forecasts, warnings and advisories (details to be provided)				
Activity 2: Track and investigate deficiencies in the format and dissemination of meteorological observations, forecasts, warnings and advisories and propose corrective action and provide information to ICAO and WMO groups for possible assistance (details to be provided)				
Activity 3: Review SIGMET test results and implement improvements				
Activity 3.1: Review SIGMET tests (conjoint session with MET/IE WG)	MET/S WG	-	Annually Mar	
Activity 3.2: Develop action plan to fix identified deficiencies	MET/S WG	3.1	Annually Mar	
Activity 3.3: Report back to MET SG on regional performance and action plan	Chair	3.2	Annually May	
Activity 3.4: Advise States of SIGMET deficiencies	Secretariat	3.3	Annually Jun	
Milestone 3***:*** *Improved issuance and compliance of SIGMETs*	MET/S WG	3.4	*Annually*	
Activity 4: GUIDANCE AND EDUCATIONAL MATERIAL				
Activity 4.1: Review the regional SIGMET Guide in coordination with the other ICAO Regions to be in line with Amendment 81 to Annex 3	**Goh Wee Poh (Singapore) (Rapporteur),** David House (Australia), Christy Leung (Hong Kong China). Chan Ho Sun (Hong Kong China), Michiko Ikeda (Japan), Chiam Keng Oon (Singapore), Dang Duc Anh (Vietnam), Le Quang Hung (Vietnam)		2024	
Activity 4.2: develop proposals for SIGMET Guide updates to include guidance relevant to SIGMET information in IWXXM form	**Goh Wee Poh (Singapore) (Rapporteur),** David House (Australia), Christy Leung (Hong Kong China). Chan Ho Sun (Hong Kong China), Michiko Ikeda (Japan), Chiam Keng Oon (Singapore), Dang Duc Anh (Vietnam), Le Quang Hung (Vietnam)		2023 ~~2022~~	
Activity 4.3: Develop and implement a plan to educate MET service providers and aviation users on the new ICAO SWX provisions – based on SWXC coordination group (METP)	Secretariat		2023 ~~2022~~	
Activity 4.4: Develop proposal to amend the ROBEX Handbook to facilitate the exchange of routine TAF for locations where States issue routine TAF every three hours instead of the recommended practice of every six hours [Report of MET/S WG/8, paragraph 3.5 refers].	Chair, Secretariat and State/s concerned		As advised by State/s concerned	
Activity 4.5: Develop proposal to amend ANP Volume III to clarify MET-related implementation planning guidance.	Chair, Secretariat		2023 ~~2022~~	
Milestone 4: Guidance and educational material available	MET/S WG		*TBD*	
Activity 5: Provide input into regional operational plans as required for specific phenomenon, including VA, radioactive cloud, TC, Tsunami and Space Weather, with consideration to global ICAO groups and WMO developments (details to be provided)				

Activity 6 – Air Navigation Deficiencies				
Activity 6.1: Assist the ICAO Secretariat with the following: a) Define a process, based on the APANPIRG Procedural Handbook, for identifying, analysing, removing and proposing MET Deficiencies; b) Develop templates to be used for Deficiency Corrective Action Plans (CAP), Progress Reports and Final Reports; c) Develop thresholds for Deficiencies based on OPMET Monitoring performance indicators and SIGMET testing; d) Review the analysis of the annual, and any ad hoc, OPMET Monitoring, and SIGMET Tests against agreed thresholds; e) Identify deficiencies from the OPMET Monitoring and SIGMET Test analysis, along with other tests and exercises, mission reports, analysis of differences against ICAO provisions, aircraft accident and incident reports and reports provided by users of air navigation services; f) Work with States concerned to develop a CAP, arrange for testing and monitoring and assist with the reporting to ICAO on the resolution of air navigation deficiencies; and g) Report recommended updates to MET Deficiencies, through MET/S WG, to MET SG.	**Paula ACETHORP (Rapporteur)** Secretariat CHEONG Wee Kiong Jarrad DENMAN Mike GRAF Keiko ITO Christy Y.Y. LEUNG Sujin PROMDUANG THAM Yap Fung Kentaro TSUBOI	4.1	Ongoing	
Activity 6.2: Monitor the implementation of the solution/s to remove deficiencies.	MET/S WG	4.2	Ongoing	
Activity 6.3: Monitor global development on the establishment of a hazardous weather information system.	MET/S WG		Ongoing	
Activity 6.4: Report progress to MET SG	Secretariat	4.3	Ongoing	
Milestone 6: Reduction in air navigation deficiencies.	MET/S WG		2023 ~~2022~~	
Activity 7 – Cost recovery strategy				
Activity 7.1: Cost recovery – assist the PMC with development of an effective cost recovery strategy for the Pacific SIDS.	Secretariat		2023 ~~2022~~	
Activity 8 – SIGMET coordination activities in APAC Region Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.				
Activity 8.1 Update the online repository on SIGMET coordination activities in the APAC Region. Activity 8.2 Update the living document on Cases of SIGMET Coordination practices with further inputs from States and update the SIGMET coordination guidance in the Regional SIGMET Guide. Activity 8.3 Review, organise and support surveys on user requirements of SIGMET coordination.	**Christy Leung (Hong Kong China), Michiko Ikeda (Japan), Goh Wee Poh (Singapore) (Joint Rapporteurs),** Lin Caiyan (China), Resa Pratikasari (Indonesia), Nurul Hidayati (Indonesia), Malaysia, India, Rassmee Damrongkietwattana (Thailand), Vietnam, Fiji, and IFALPA, Coordinated by the Chairperson and Secretariat		2023-2026 ~~2022~~	

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Appemdix C to the Report

LIST OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

Adapted from APANPIRG/33, Appendix D to the Report on Agenda Item 4.
Updates endorsed by APANPIRG/33 show deleted text using strikeout (~~text to be deleted~~) and added text with grey shading (text to be inserted).

REPORTING FORM ON (OPEN) AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ Facilities** (Index No.)	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
MWO and SIGMET service (Annex 3: Chapter 3, 3.4 and Chapter 7)	**Democratic Peoples' Republic of Korea** (DPRK) (AP-MET-16)	Requirements for MWO and SIGMET service not established for Pyongyang FIR	2008	Reported by ICAO Regional Office mission	Establish MWO to provide required service, including SIGMET information for Phnom Penh FIR. **See notes below for more information.**	GACA, Democratic Peoples' Republic of Korea	TBC	A
Meteorological observations and reports. (Annex 3: Chapter 4)	**Kiribati** (AP-MET-02)	METAR from Kiribati not available on regular basis.	1998	Reported by airlines	Equipment to be installed and arrangements to be made for regular observations and reports, including: training of personnel; maintenance of equipment; calibration and verification of meteorological observations; and proper/secure transmission of data. **See notes below for more information.**	State designated MET authority	TBC	A
Meteorological information for operators and flight crew members, including forecasts provided by the WAFCs (Annex 3: Chapter 9)	**Kiribati** (AP-MET-18)	WAFC forecasts not available for inclusion in flight briefings and documentation	2008	Reported by TCB CAEMSA-SP Technical Expert	Implement procedures and systems for the required meteorological information to be supplied to operators and flight crew members, including forecasts generated from the digital forecasts provided by the WAFCs. **See notes below for more information.**	State designated MET authority	TBC	U
Meteorological information for operators and flight crew members, including forecasts provided by the WAFCs (Annex 3: Chapter 9)	**Nauru** (AP-MET-19)	WAFC forecasts not available for inclusion in flight briefings and documentation	2008	Reported by TCB CAEMSA-SP Technical Expert	Implement procedures and systems for the required meteorological information to be supplied to operators and flight crew members, including forecasts generated from the digital forecasts provided by the WAFCs. **See notes below for more information.**	State designated MET authority	TBC	U
Meteorological observations and reports. (Annex 3: Chapter 4)	**Nauru** (AP-MET-21)	METAR/SPECI service not provided	2008	Reported by TCB CAEMSA-SP Technical Expert	Equipment to be installed and arrangements to be made for regular observations and reports, including: training of personnel; maintenance of equipment; calibration and verification of meteorological observations; and proper/secure transmission of data. **See notes below for more information.**	State designated MET authority	TBC	U

LIST OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

REPORTING FORM ON (OPEN) AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ Facilities** (Index No.)	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Provision of SIGMET information (Annex 3, Chapter 7)	**Nauru** (AP-MET-24)	Lack of SIGMET issued for the Nauru FIR.	Sep 2011	IATA deemed this situation unsafe and unacceptable to airline operations.	Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. **See notes below for more information.**	State designated MET authority	TBC	U
Provision of SIGMET information (Annex 3: Chapter 7)	**Nepal** (AP-MET-14)	Requirements for issuance and dissemination of SIGMET information for Kathmandu FIR have not been fully implemented	2000		Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. **See notes below for more information.**	State designated MET authority	TBC	A
Reporting of information on volcanic eruptions to civil aviation units. (Annex 3, 3.6, 4.8)	**Papua New Guinea** (AP-MET-04)	Information on volcanic activity not provided regularly to ATS units, MWOs and VAACs.	1995	Observed by States concerned. Reported at the WMO/ICAO Workshop on Volcanic Ash Hazards (Darwin, 1995)	Establish arrangements for State volcano observatories to send the required volcano observation information as quickly as practicable to the associated ACC/FIC, MWO and VAAC. **See notes below for more information.**	Rabaul Volcano Observatory, NWS and ASL of Papua New Guinea	TBC	A
Provision of SIGMET for volcanic ash (Annex 3: Chapter 7)	**Papua New Guinea** (AP-MET-08)	Requirements for issuance and proper dissemination of SIGMET for volcanic ash have not been fully implemented	Dec 2003	Reported by airlines, noted by Volcanic Ash Advisory Centres and confirmed by ICAO mission	Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of volcanic ash. **See notes below for more information.**	NWS of Papua New Guinea	TBC	U

LIST OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

REPORTING FORM ON (OPEN) AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ Facilities** (Index No.)	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Provision of SIGMET information (Annex 3, Chapter 7)	**Papua New Guinea** (AP-MET-22)	Lack of SIGMET issued for the Port Moresby FIR.	Sep 2011	IATA deemed this situation unsafe and unacceptable to airline operations.	Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. **See notes below for more information.**	State designated MET authority	TBC	U
Meteorological information for operators and flight crew members, including forecasts provided by the WAFCs (Annex 3: Chapter 9)	**Solomon Islands** (AP-MET-20)	WAFC forecasts not available for inclusion in flight briefings and documentation	2008	Reported by TCB CAEMSA-SP Technical Expert	Implement procedures and systems for the required meteorological information to be supplied to operators and flight crew members, including forecasts generated from the digital forecasts provided by the WAFCs. **See notes below for more information.**	State designated MET authority	TBC	U
~~Provision of SIGMET information (Annex 3, Chapter 7)~~	~~**Solomon Islands** (AP-MET-23)~~	~~Lack of SIGMET issued for the Honiara FIRs.~~	~~Sep 2011~~	~~IATA deemed this situation unsafe and unacceptable to airline operations.~~	~~Implement procedures for SIGMET information to be issued by the designated meteorological watch office/s concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations.~~ ~~**See notes below for more information.**~~	~~State designated MET authority~~	~~TBC~~	~~U~~
Reporting of information on volcanic eruptions to civil aviation units. (Annex 3: 3.6, 4.8)	**Tonga** (AP-MET-17)	Information on volcanic activity not provided regularly to ATS units, MWOs and VAACs	2008	Reported by TCB CAEMSA-SP technical expert	Establish arrangements for State volcano observatories to send the required volcano observation information as quickly as practicable to the associated ACC/FIC, MWO and VAAC. **See notes below for more information.**	MOI and MEIDECC	TBC	U

NOTES ON THE (<u>OPEN</u> AND <u>CLOSED</u>) AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION				
Index No.	**State**	**Update Date**	**NOTES ON <u>OPEN</u> AND <u>CLOSED</u> DEFICIENCIES**	**Status**
AP-MET-01	Solomon Islands	December 2020	Removed from the open List; APANPIRG/31 Conclusion 31/19, refers.	Closed

LIST OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

NOTES ON THE (OPEN AND CLOSED) AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION				
Index No.	**State**	**Update Date**	**NOTES ON OPEN AND CLOSED DEFICIENCIES**	**Status**
AP-MET-02	Kiribati	September 2017	APANPIRG/28 noted that Kiribati should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-03	Indonesia	September 2017	Removed from the open List, APANPIRG/28 Conclusion 28/29 refers.	Closed
AP-MET-04	Papua New Guinea	November 2022 September 2017	APANPIRG/33 noted MET SG/26 recommended that Papua New Guinea: • Conduct additional corrective actions, including seeking confirmation from the recipient operational units and providing evidence of the relevant established procedures; and • Submit an official report to ICAO providing complete details of the action taken. APANPIRG/28 noted that Papua New Guinea should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-05	–	–	This Index No. is not used.	Closed
AP-MET-06	Indonesia	September 2017	Removed from the open List, APANPIRG/28 Conclusion 28/29 refers.	Closed
AP-MET-07	Philippines	November 2019	Removed from the open List, Conclusion APANPIRG/30/19, refers.	Closed
AP-MET-08	Papua New Guinea	September 2017	APANPIRG/28 noted that Papua New Guinea should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-09	Cambodia	September 2018	Removed from the open List, APANPIRG/29 Decision 29/23 refers	Closed
AP-MET-10	–	–	This Index No. is not used.	Closed
AP-MET-11	Cambodia	September 2018	Removed from the open List, APANPIRG/29 Decision 29/24 refers	Closed
AP-MET-12	Lao PDR	September 2018	Removed from the open List, APANPIRG/29 Decision 29/24 refers	Closed
AP-MET-13	–	–	This Index No. is not used.	Closed
AP-MET-14	Nepal	September 2017	APANPIRG/28 noted that Nepal should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-15	–	–	This Index No. is not used.	Closed

LIST OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

NOTES ON THE (OPEN AND CLOSED) AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION				
Index No.	**State**	**Update Date**	**NOTES ON OPEN AND CLOSED DEFICIENCIES**	**Status**
AP-MET-16	Democratic People's Republic of Korea	September 2017	APANPIRG/28 noted that DPRK should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-17	Tonga	November 2022	APANPIRG/33 noted MET SG/26 recommended that Tonga: • Conduct additional corrective actions, including seeking confirmation from the recipient operational units and providing evidence of the relevant established procedures; and • Submit an official report to ICAO providing complete details of the action taken.	**Open**
		September 2017	APANPIRG/28 noted that: • Removal of the Deficiency from the open List is subject to the concurrence of the ATS units, MWOs and VAACs concerned that the Deficiency is resolved.	
		June 2018	MET SG/22 noted that: • VAAC Wellington was coordinating with Tonga on the validation of corrective action taken to resolve the Deficiency.	
		29 May 2017	MOI, Civil Aviation Division, advised that: • Relevant operating procedures implemented in the units concerned and case studies of real volcanic events presented as evidence of the State volcano observatory's issuance of the required volcano observation information.	
		10 May 2013	Ministry of Infrastructure (MOI), Civil Aviation Division, advised that: • MOU established between the national authority providing volcano monitoring (Ministry of Lands, Environment, Climate Change and Natural Resources – MLECCNR) and the national authority providing meteorological service for international air navigation (MOl) for the reporting of volcanic activity to the associated ACCs, MWOs and VAACs in accordance with the relevant ICAO SARPs.	
AP-MET-18	Kiribati	September 2017	APANPIRG/28 noted that Kiribati should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-19	Nauru	September 2017	APANPIRG/28 noted that Nauru should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-20	Solomon Islands	September 2017	APANPIRG/28 noted that Solomon Islands should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
		June 2019	MET SG/23 requested the Secretary in conjunction with support from other States to provide Solomon Islands with assistance in preparing the full report on rectification of the Deficiency.	

LIST OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

NOTES ON THE (OPEN AND CLOSED) AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION				
Index No.	**State**	**Update Date**	**NOTES ON OPEN AND CLOSED DEFICIENCIES**	**Status**
AP-MET-21	Nauru	September 2017	APANPIRG/28 noted that Nauru should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-22	Papua New Guinea	September 2017	APANPIRG/28 noted that Papua New Guinea should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**
AP-MET-23	Solomon Islands	November 2022	Removed from the open List; refer to: • Conclusion APANPIRG/33/14 – *Update of information in APANPIRG Air Navigation Deficiencies Reporting Form*; • APANPIRG/33 WP/14 – *STATUS OF AIR NAVIGATION DEFICIENCIES IN THE ASIA/PAC REGION*; • APANPIRG/33 WP/13 – *METEOROLOGY SUB-GROUP (MET SG/26) REPORT*; and • APANPIRG/33 IP/08 – *RECTIFICATION OF APANPIRG AN DEFICIENCY AP-MET-23*	Closed
		October 2021	MET SG/25 requested the Solomon Islands, with assistance from its partner States, to conduct additional corrective action to enable the MET SG to confirm that Solomon Islands had fully resolved the Deficiency; maintain a log of all SIGMETs issued over at least one month to capture the operational WC-, WS- and WV-SIGMETs, plus any test WV-SIGMETs; pass the details [of the log] to the ad hoc group [on AN Deficiencies] to compare against SIGMETs received by RODB Brisbane [MET SG/25, Action No. 25/10]. Subject to Solomon Islands demonstrating resolution of the issues concerning content, format and timeliness of SIGMET information (as discussed in MET SG/25, WP/12) and sustainable provision of ICAO-compliant SIGMET service, MET SG would support the removal of Deficiency AP-MET-23 from the APANPIRG open list. Therefore, to facilitate the removal of the Deficiency from the open List, MET SG/25 requested the Secretariat coordinate with the Solomon Islands to report the resolution of the Deficiency to APANPIRG [MET SG/25, Action No. 25/11].	
		June 2019	MET SG/23 requested the Secretary in conjunction with support from other States to provide Solomon Islands with assistance in preparing the full report on rectification of the Deficiency.	
		September 2017	APANPIRG/28 noted that Solomon Islands should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	
AP-MET-24	Nauru	September 2017	APANPIRG/28 noted that Nauru should: • Verify the status of implementation of CAP; and • Work together with ICAO to develop and properly record the remaining steps of the CAP to resolve the Deficiency.	**Open**

Acronyms/Abbreviations/Definitions (used in this document)

ACC — Area control centre
ASL — Air Services Ltd.
ATS — Air traffic services

LIST OF AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

Acronyms/Abbreviations/Definitions (used in this document)

CAEMSA-SP	— Cooperative Agreement for the Enhancement of Meteorological Services to Aviation - South Pacific
CAP	— Corrective action plan
FIC	— Flight information centre
FIR	— Flight information region
GACA	— General Administration of Civil Aviation
IATA	— International Air Transport Association
MEIDECC	— Ministry of Meteorology, Energy, Information, Disaster Management, Environment, Climate Change and Communication
MET	— Meteorological
METAR	— Aerodrome routine meteorological report *(in meteorological code)*
MWO	— Meteorological watch office
NWS	— National Weather Service
SIGMET	— Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations
SPECI	— Aerodrome special meteorological report *(in meteorological code)*
TBC	— To be confirmed
TCB	— Technical Cooperation Bureau (of ICAO)
VAAC	— Volcanic ash advisory centre
WAFC	— World area forecast centre
WMO	— World Meteorological Organization

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List of Participants

	STATE/NAME		TITLE/ORGANIZATION	TEL/FAX/E-MAIL
1.	**AUSTRALIA (2)**			
	1.	Mr. David House	Operational Systems Specialist Australian Bureau of Meteorology	david.house@bom.gov.au;
	2.	Mr. Tim Hailes	National Manager - Transport Customer Engagement Australian Bureau of Meteorology	tim.hailes@bom.gov.au;
2.	**BHUTAN (1)**			
	3.	Ms. Ugyen Lhamo	Meteorology/Hydrology Officer National Centre for Hydrology and Meteorology (NCHM)	ulhamo@nchm.gov.bt;
3.	**BRUNEI DARUSSALAM (2)**			
	4.	Mr. Hassanul Kamal Haji Adam	Meteorological Officer Brunei Darussalam Meteorological Department	hassanul.adam@met.gov.bn;
	5.	Mr. Shahalmie Emran	Meteorological Coordinator and Technical Officer Brunei Darussalam Meteorological Department	shahalmie.embran@met.gov.bn;
4.	**CAMBODIA (2)**			
	6.	Mr. Sivarak Chutipong	Director of Technical Development Cambodia Air Traffic Services	sivarakc@cats.com.kh;
	7.	Mr. Heang Vandy	Aeronautical Services Department State Secretariat of Civil Aviation – Cambodia	heangvandy@ssca.gov.kh;
5.	**HONG KONG CHINA (1)**			
	8.	Ms. Christy Leung	Scientific Officer Hong Kong Observatory	yyleung@hko.gov.hk;

	STATE/NAME		TITLE/ORGANIZATION	TEL/FAX/E-MAIL
6.	**FIJI (2)**			
	9.	Mr. William Reece	Manager - Air Navigation Engineering Services Fiji Airports	williamr@fijiairports.com.fj;
	10.	Mr. Makiti Raratabu	Air Navigation Services Inspector - ATM/MET CAA Fiji	makiti.raratabu@caaf.org.fj;
7.	**INDIA (1)**			
	11.	Mr. Gajendra Kumar	Scientist F India Meteorological Department	gajendra71.kumar@imd.gov.in;
8.	**INDONESIA (4)**			
	12.	Mr. Mufti Kamil	Dissemination Information for Aviation Meteorology BMKG Indonesia	mufti.kamil@bmkg.go.id;
	13.	Mr. Iqbal Maududi	Air Navigation Inspector DGCA Indonesia	iqbal.maududi8909@gmail.com;
	14.	Mr. Rydnovelles -	Air Navigation Inspector DGCA Indonesia	rydnov@yahoo.co.id;
	15.	Mr. Rajasain Edralin	Weather Forecaster Indonesian Agency for Meteorology, Climatology and Geophysics	sainsr2f@gmail.com;
9.	**JAPAN (3)**			
	16.	Ms. Erika Hayami	Senior Coordinator for International Aeronautical Meteorology Japan Meteorological Agency	e-hayami@met.kishou.go.jp;
	17.	Ms. Michiko Ikeda	Scientific Officer Japan Meteorological Agency	michi-ikeda@met.kishou.go.jp;

	STATE/NAME		TITLE/ORGANIZATION	TEL/FAX/E-MAIL
	18.	Mr. Tomohiro Nozawa	Assistant Scientific Officer Japan Meteorological Agency	tomohiro.nozawa@met.kishou.go.jp;
10.		**NEW ZEALAND (1)**		
	19.	Ms. Paula Acethorp	Chief Meteorological Officer Civil Aviation Authority of New Zealand	paula.acethorp@caa.govt.nz;
11.		**PAKISTAN (1)**		
	20.	Mr. Zulfiqar Alam	Joint Director (ATM AANS) Civil Aviation Authority of Pakistan	Zulfiqar.Alam@caapakistan.com.pk; aviatorphy@gmail.com;
12.		**PHILIPPINES (3)**		
	21.	Mr. Jose V Festejo. Jr	Aviation Services Safety Inspector Civil Aviation Authority of the Philippines	jadper_fr@yahoo.com;
	22.	Ms. Hannagrace Cristi	Assistant Weather Services Chief Philippines Atmospheric, Geophysical and Astronomical Services Administration Civil Aviation Authority of the Philippines	hannagrace.cristi@pagasa.dost.gov.ph; hannacristi@yahoo.com;
	23.	Mr. Florian S. Atienza	Division Chief III Air Navigation Service (ANS) Civil Aviation Authority of the Philippines	
13.		**REPUBLIC of KOREA (2)**		
	24.	Ms. Mijeong Shim	Assistant Director Aviation Meteorological Office of Korea Meteorological Administration	mjshim@korea.kr;
	25.	Ms. Hansol Lee	Assistant Director Korea Meteorological Administration	dlgkth@naver.com;
14.		**SINGAPORE (3)**		

	STATE/NAME		TITLE/ORGANIZATION	TEL/FAX/E-MAIL
	26.	Mr. Yi Wei Yeoh	Senior Manager (CNS/MET Regulation) Civil Aviation Authority of Singapore (CAAS)	yeoh_yi_wei@caas.gov.sg;
	27.	Mr. Goh Wee Poh	Head, Customer Services Branch, Forecast Operations Department Meteorological Service Singapore	goh_wee_poh@nea.gov.sg;
	28.	Mr. Keng Oon Chiam	Senior Meteorologist National Environment Agency	chiam_keng_oon@nea.gov.sg;
15.	**THAILAND (14)**			
	29.	Mr. Suttipong Kornrapat	Air Traffic Engineer Aeronautical Radio of Thailand (Aerothai)	suttipong.kr@aerothai.co.th;
	30.	Mr. Auttaphud Suebnuang	Executive Air Traffic Systems Engineer Aeronautical Radio of Thailand Ltd.	auttaphud.se@aerothai.co.th;
	31.	Mr. Bunpot Kujaphun	International NOTAM Office Aerothai, Aeronautical Radio of Thailand Ltd.	bunpot.ku@aerothai.co.th;
	32.	Ms. Narissara Na Rangsri	Aeronautical Information Assistant Manager Aerothai, Aeronautical Radio of Thailand Ltd.	comm.future@gmail.com;
	33.	Mr. Pongpob Mongkolpiyathana	Engineer Aerothai, Aeronautical Radio of Thailand Ltd.	pongpob.mo@aerothai.co.th;
	34.	Mr. Prinya Viyasilpa	Air Traffic Engineering Manager Aerothai, Aeronautical Radio of Thailand Ltd.	prinya.vi@aerothai.co.th;
	35.	Mr. Wanchai Rattanasing	Aeronautical Information Manager Aerothai, Aeronautical Radio of Thailand Ltd.	wanchai.ra@aerothai.co.th;

	STATE/NAME		TITLE/ORGANIZATION	TEL/FAX/E-MAIL
	36.	Mr. Worapong Jirojkul	Senior Air Traffic Systems Engineer Aerothai, Aeronautical Radio of Thailand Ltd.	jworapong@gmail.com;
	37.	Mr. Somchai Yimsricharoenkit	Meteorological Specialist Civil Aviation Authority of Thailand (CAAT)	somchai.y@caat.or.th;
	38.	Ms. Paweena Panikodom	Meteorologist Thai Meteorological Department	pavna55@hotmail.com;
	39.	Mr. Pongkhun Maneesri	Meteorologist Thai Meteorological Department	pongkhun@gmail.com;
	40.	Mr. Putchaphan Sirisap	Meteorologist Thai Meteorological Department	siri_putch@hotmail.com;
	41.	Ms. Rassmee Damrongkietwattana	Director of Aeronautical Weather Monitoring Sub-Division Thai Meteorological Department	rassmee@hotmail.com;
	42.	Mr. Chaiwat Saekhew	Officer The Civil Aviation Authority of Thailand	chaiwat.s@caat.or.th;
16.	**VIET NAM (4)**			
	43.	Mr. Hung Phan Ba	Deputy Director of AMC Aviation Meteorological Centre (AMC)- VATM	hungphb@yahoo.com;
	44.	Ms. Vu Thi Thanh Tam	MET Official Vietnam Air Traffic Cooperation	vuthithanhtam86@gmail.com;
	45.	Ms. Nguyen Lan Oanh	Deputy Director of Air Navigation Department (AND) Civil Aviation Authority of Vietnam (CAAV)	lanoanh@caa.gov.vn;

	STATE/NAME		TITLE/ORGANIZATION	TEL/FAX/E-MAIL
17.	**ICAO (2)**			
	46.	Mr. Peter Dunda	Regional Officer MET International Civil Aviation Organization Asia and Pacific Office	pdunda@icao.int;
	47.	Ms. Varapan Meefuengsart	Program Assistant International Civil Aviation Organization Asia and Pacific Office	vmeefuengsart@icao.int;

LIST OF WORKING AND INFORMATION PAPERS

WORKING/INFORMATION PAPERS			
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1	WP/01	Provisional Agenda	Secretariat
2	WP/02	Follow-up Action from MET/IE WG/20	Secretariat
2	WP/03	Follow-up Action from MET SG/26	Secretariat
2	WP/04	Follow-up Action from APANPIRG/33	Secretariat
5	WP/05	QMS Updates from Solomon Islands and Other Pacific Islands States	Solomon Islands
4	WP/06	Review of Air Navigation Deficiencies in the MET Field	Secretariat
6	WP/07	Resolution of MET Deficiency AP-MET-14	Nepal
6	WP/08	APAC VOLCEX 22/01 Finding: Exercise indicator inconsistency in the Guidance	Indonesia
7	WP/09	Updates to Regional SIGMET Guide	Australia
5	WP/10	Progress of the Ad Hoc Group on SIGMET Coordination	Ad hoc Group
5	WP/11	Space Weather Exercise and Education	Australia
7	WP/12	Review MET/S WG Work Program and Terms of Reference	Secretariat
8	WP/13	Proposals for the Amendment of ICAO Annex 3	Secretariat
3	WP/14	SIGMET Issuance for Convective Systems Over Multiple FIRS	Japan
Conjoint session of MET/IE SG/21 and MET/S WG/13			
C2	WP/C01	Review of WS SIGMET Test 2022	Singapore
C2	WP/C02	Results of SIGMET Tests 2022 - TC and VA	Japan

INFORMATION PAPERS			
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1	IP/01	Meeting Bulletin	Secretariat
3	IP/02	Provision of Three-Hourly TAF for VHHH	Hong Kong China
4	IP/03	SIGMET Coordination Updates in Indonesia	Indonesia
4	IP/04	Update on the South and South-Eastern Asia SIGMET Coordination Project	Hong Kong China, India, Indonesia, Nepal and Sri Lanka

WORKING/INFORMATION PAPERS			
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5	IP/05	SIGMET Coordination Work between the People's Republic of China and the Republic of Kazakhstan	China and Kazakhstan
4	IP/06	Achievements and Future Plans of the Pilot Project on SIGMET Coordination between the Republic of Korea and the People's Republic of China	Republic of Korea and China
4	IP/07	Quality Management System for Aviation Weather Services in Hong Kong, China	Hong Kong, China
4	IP/08	Implementation of QMS in Aeronautical Meteorology Service in Indonesia	Indonesia
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4	IP/10	Program of Competency Qualification and Competency-Based Training for Aeronautical Meteorological Personnel in Vietnam	Vietnam

FLIMSY			
Agenda Item	**Flimsy No.**	**Title**	**Presented by**
5	Flimsy/01	Statistics of SIGMET Issuance of Nepal	Hong Kong China

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