

INTERNATIONAL CIVIL AVIATION ORGANIZATION



**REPORT OF THE NINETH MEETING OF THE ASIA AND PACIFIC
METEOROLOGICAL REQUIREMENTS WORKING GROUP
(MET/R WG/9)**

Web-conference, 7 May and 11 – 14 May, 2020

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

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

MET/R WG/9
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INTRODUCTION

1. Meeting

1.1. The ICAO Asia and Pacific (APAC) Regional Office hosted the Ninth Meeting of the Meteorological Requirements Working Group (MET/R WG/9) via web-conference from Bangkok, Thailand on 7 May and 11 to 14 May, 2020.

1.2. The previously planned Meteorology (MET)/Air Traffic Flow Management (ATFM) Seminar and Joint Plenary Session of MET/R WG/9 and Tenth Meeting of Air Traffic Flow Management Steering Group (ATFM/SG/10) was postponed until further notice due to the global COVID-19 pandemic.

2. Attendance

2.1. Sixty-nine (69) participants attended the meeting from sixteen (16) States and Administrations, including Australia, China, Hong Kong China, Indonesia, Japan, Lao People's Democratic Republic, Malaysia, Mongolia, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Thailand, United States and Viet Nam, and the International Air Transport Association (IATA), International Federation of Air Line Pilot's Associations (IFALPA) and ICAO. The list of participants is at **Appendix E** to this Report.

3. Officers and Secretariat

3.1. Mr. Ashwin Naidu, Senior Aviation Customer Lead, Australian Bureau of Meteorology, presided as Chair of the meeting, assisted by Ms. Naoko Komatsu, Senior Scientific Officer, Office of International Affairs, Japan Meteorological Agency (JMA), as Vice-Chair.

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

4. Language and Documentation

4.1. The working language of the meeting was English, inclusive of all documentation and this Report. The meeting considered nine (9) Working Papers (WPs), four (4) Information Papers (IPs) and one (1) Discussion Paper (DP). The list of papers is at **Appendix D** to this Report.

5. Outcomes from the meeting

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

- a) **Draft Conclusions:** formulated 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, in accordance with established APANPIRG procedures;

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

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

Decision MET/R WG/9/1 – Updates to the terms of reference

That, the MET/R WG adopts the proposed updates to the terms of reference, as highlighted at the Appendix A to this Report.

Draft Conclusion MET/R WG/9/2 – Survey of State Meteorological Information Supporting Air Traffic Management

That, the MET SG approve the proposed terms of reference (ToR) and the survey questionnaire and inform ATM SG/7 (in August 2020) and then circulate the survey questionnaire for States to respond in October/November 2020 or at an appropriate time

Draft Conclusion MET/R WG/9/3 – Update on Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations

That, the MET SG approve the proposed updates to the Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations

Decision MET/R WG/9/4 – Updates to the Plan of Work

That, the MET/R WG adopts the proposed updates to the plan of work, as highlighted at the Appendix B to this Report.

5.3. In addition, the meeting agreed to two (2) action items, as indicated in the *Report on Agenda Items*, below, and list of agreed actions at the **Appendix C** to this Report.

REPORT ON AGENDA ITEMS

1. Opening of the meeting and organizational matters

1.1. The Secretary hosted a meeting web-conference introductory session on 7 May 2020 to facilitate participants' familiarization with the web-conference format and modalities for conducting the meeting.

1.2. The Secretary and Chair officially opened the meeting web-conference discussion session at 10:00 hrs. in Bangkok on 11 May 2020. The Chair provided opening remarks and welcomed all participants to the meeting.

Adoption of the agenda (WP/01)

1.3. The meeting adopted the provisional agenda as circulated to participants prior to the meeting and as shown below:

- Agenda Item 1: Opening of the meeting and organizational matters
- Agenda Item 2: Review outcomes from related meetings
- Agenda Item 3: Review progress on the work programme
- Agenda Item 4: MET information required to support end-user systems
- Agenda Item 5: Coordination between MET and ATM services
- Agenda Item 6: Review work programme and terms of reference
- Agenda Item 7: Any other business
- Agenda Item 8: Next meeting

Review the Terms of Reference (WP/02)

1.4. The meeting reviewed the terms of reference (ToR) of the MET/R WG to ensure the Group remains aligned with the broader objectives of the Meteorology Sub-Group (MET SG) and the APAC Air Navigation Planning and Implementation Regional Group (APANPIRG).

1.5. The meeting proposed several updates to the membership details listed in the ToR document, as advised by meeting participants, to reflect the current status of membership on the Group by experts from China, Japan, New Zealand, Pakistan, Singapore, Thailand and United States. The proposed updates are highlighted in the ToR at the **Appendix A** to this Report.

1.6. In view of the discussion above, the meeting adopted the following Decision:

Decision MET/R WG/9/1 – Updates to the terms of reference

That, the MET/R WG adopts the proposed updates to the terms of reference, as highlighted at the Appendix A to this Report.

2. Review outcomes from related meetings

Review Outcomes from MET/R WG/8 and MET SG/23 (WP/03)

2.1. The meeting reviewed relevant outcomes from the Eighth Meeting of the Meteorological Requirements Working Group (MET/R WG/8) and the Twenty-Third Meeting of the Meteorology Sub-Group (MET SG/23), and, in particular, the status of follow-up action on the following subject matters:

- *Regional Guidance for Tailored MET to Support ATM Operations;*
- *Regional guidance for the alignment of cross-FIR-boundary SIGMET information;*
- *APAC Regional Document for SWIM-based MET Information Services Supporting ATFM;*
- *Survey of State Meteorological Information Supporting Air Traffic Management;*
and
- *MET/R WG plan of work and terms of reference document.*

2.2. Based on the progress of follow-up action on the MET/R WG/8 and MET SG/23 outcomes, as presented in WP/03, the meeting agreed to update the MET/R WG plan of work as follows:

2.2.1. Close the deliverables 4.4 and 4.5 and the follow-up action on Decision MET/R WG/8/1 – *Update on Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations;*

2.2.2. Close the deliverables 1.3 and 1.4 and the follow-up action on Decision MET/R WG/8/2 – *Regional guidance for the alignment of cross-FIR-boundary SIGMET information;*

2.2.3. Establish a new deliverable 8 as follow-up to Decision MET SG/23/7 – *Development of APAC User Requirements for SWIM-based MET Information Services Supporting ATFM;*

2.2.4. Close the deliverables 2.4 and 2.5 and revise the follow-up action on Decision MET/R WG/8/4 – *Survey of State Meteorological Information Supporting Air Traffic Management;* and

2.2.5. Revise the deliverable 7, related to SIGMET coordination activities in APAC Region, to focus more on tasks that determine the [end-]users' requirements in relation to the SIGMET coordination activities.

2.3. The proposed updates to the MET/R WG plan of work are highlighted at the **Appendix B** to this Report. The meeting also noted that additional proposals, which may lead to additional updates to the plan of work in relation to the above deliverables, would be addressed to the meeting in WP/04, WP/05, WP/06 and WP/09, which are discussed further in the Report, below.

3. Review progress on the work programme

APAC User Requirements for SWIM-based MET Information Services Supporting ATFM (WP/04)

3.1. The meeting reviewed a proposal, presented by Australia, Hong Kong, China, and Thailand, on the development of APAC use-cases and user-requirements for System-Wide Information Management (SWIM)-based meteorological (MET) information services supporting air traffic flow management (ATFM).

3.2. The proposal represented follow-up action on Decision MET SG/23/7 – *Development of APAC User Requirements for SWIM-based MET Information Services Supporting ATFM*, which is also discussed at para. 2.1 to 2.3, above, and Action Item 7/7 from the Seventh Meeting of the Air Traffic Management Sub-Group (ATM/SG/7), Bangkok, Thailand, 05 – 09 August 2019, which call for the MET/R WG, in conjunction with the ATFM SG, to prepare a more mature terms of reference and establish an ad-hoc group of subject matter experts from the MET and ATFM fields for the above mentioned development work.

3.3. The proposal in WP/04 included a list of proposed terms of reference for the work, as well as examples of use-cases and data catalogues and a draft table of contents of user-requirements for SWIM-based MET information services supporting ATFM.

3.4. Considering the ICAO Meteorology Panel’s established and ongoing work in this area, including the development of a (global) *Plan for Meteorology in System Wide Information Management (SWIM)*, the meeting noted that the proposed ad-hoc group’s work shall be supplementary to the global initiatives and specifically focused on regional requirements. The meeting, therefore, suggested appropriate editorial changes to the proposed terms of reference at para. 2.6 of WP/04, items 3), 5) and 6), as shown below:

Note: Proposed updates to the terms of reference at para. 2.6 of WP/04 are arranged to show deleted text using ~~strikeout~~ (text to be deleted), and added text with grey shading (text to be inserted)

- 1) To focus on SWIM-based MET information services specifically addressing the needs of ATFM in the APAC Region;
- 2) To document user requirements and use cases from ATFM in the APAC Region to facilitate the development of future SWIM-based MET information services;
- 3) To supplement the global concept described in the MET-SWIM Plan, prepared by the METP WG-MIE, and support the MET requirements being developed by the METP Working Group on Meteorological Requirements and Integration (WG-MRI) in a global sense and IWXXM development by METP WG-MIE for effective exchange of MET information supporting AFTM operation;

- 4) To assist SWIM TF in identifying and developing the specifications of information services required to support operations based on user needs;
- 5) To identify MET and ATFM data to be exchanged using SWIM-based Information Exchange Services in the Region (examples shown in Appendix B [of WP/04]) to enable the effective MET/ATM integration and to provide the baseline for further development of the regional SWIM data catalogue and service catalogue; and
- 6) To identify other granular MET-related requirements from ATFM perspective such as update frequency and forecast lead time of MET information to better support the development of future MET Information Exchange Services in the Region.

3.5. In addition, considering the broad scope of MET information user groups, which includes, but is not limited to, users in the ATFM field, the meeting noted it would be appropriate for the proposed ad-hoc group to coordinate aspects of its work with other relevant bodies of APANPIRG.

3.6. For example, the meeting noted that ongoing work on the *Survey of State Meteorological Information Supporting Air Traffic Management*, which is further discussed at para. 3.10 – 3.16, below, and is being conducted under the MET/R WG plan of work, would provide an opportunity for coordination between relevant groups on the proposed ad-hoc group's work on the assessment of user-requirements for SWIM-based MET information.

3.7. The meeting also noted that the ATFM/SG/10, web-conference, on 04 to 08 May 2020, reviewed and supported the above proposal and nominated subject matter experts from the ATFM field to participate in the proposed ad-hoc group.

3.8. In view of the discussion above, the meeting established an ad-hoc group and endorsed the terms of reference, subject to the proposed changes at para. 3.4, above, for the development of APAC use-cases and user-requirements for SWIM-based MET information services supporting ATFM, as proposed in WP/04.

3.9. Relevant updates by the meeting to the MET/R WG plan of work, including membership details of the ad-hoc group, are proposed and highlighted under deliverable 8 in the plan of work at the **Appendix B** to this Report. The meeting also noted that the proposed updates to the plan of work in relation to the above deliverable would be addressed to the meeting in WP/09, which is discussed further at para. 6.1 to 6.4, below.

Survey of State Meteorological Information Supporting Air Traffic Management (WP/05)

3.10. The meeting reviewed progress of the designated ad-hoc group on the proposed terms of reference and the revised, draft questionnaire for the survey of current and future MET information services provided by States to support Air Traffic Management (ATM) and, in particular, Air Traffic Flow Management (ATFM).

3.11. The meeting recalled that the ad-hoc group had previously intended to circulate the survey questionnaire for States to respond in October/November 2019 (Decision MET/R WG/8/4, refers). However, in the interim, MET SG/23 requested the ad-hoc group to further develop the survey questionnaire, and develop the terms of reference for the survey (MET SG/23: task 23/13, refers). This was also discussed in WP/02 and at para. 2.1 to 2.3 above.

3.12. The meeting provided the following suggestions with respect to the survey questionnaire for the ad-hoc group's further consideration:

- Clarify how a State/Administrative Region should specify its ‘level of implementation of ATFM’;
- Pose the question (Part C2) (8), on aerodrome MET information, to both ATM and Airspace User respondents;
- Include, at question (Part C2) (9) in the table of airspace (en-route) MET information, the parameter ‘Deep Convection’ or ‘Convective Clouds’ or ‘Towering Cumulus Clouds’, in addition to the parameter ‘Thunderstorms’;
- Provide some clarification on the use of the term ‘Rating’ at questions (Part C2) (8) – (12); and include the impact of weather elements on ATM operations by adding “impact” as another dimension of the importance of information, apart from “usefulness”, in questions (Part C2) (8) – (10);
- Include weather-related runway condition monitoring (Note, however, that Annex 3 provisions for reporting information on the state of the runway are only applicable up until 4 November 2020; following which runway condition reporting provisions fall under Annex 14 Volume 1 – *Aerodrome Design and Operations*, from 5 November 2020);
- Include special air reports; and
- Change "Start time and duration" in the characteristic description of MET in the question (Part C2) (10) to "Time of issuance and validity".

3.13. The meeting noted that, although the draft survey questionnaire had already undergone extensive development and reviews, MET SG/23 had suggested conducting a small trial-run of the survey questionnaire to gain feedback and make adjustments as necessary. Therefore, the meeting considered it would be beneficial for the ad-hoc group to conduct some form of trial of the survey questionnaire before presenting it to MET SG/24 for final endorsement and conducting the Regional survey.

3.14. In view of the discussion above, the meeting endorsed the proposed terms of reference and the revised survey questionnaire in WP/05. The meeting proposed that the ad-hoc group continues to take into consideration the meeting’s feedback, at para.3.12, above, and any further comments on the questionnaire from the MET/R WG up until 29 May 2020, including feedback from trial-runs, to make final adjustments to the survey questionnaire no later than 29 June 2020.

3.15. Relevant updates by the meeting to the MET/R WG plan of work are proposed and highlighted under deliverable 2 in the plan of work at the **Appendix B** to this Report. The meeting also noted that the proposed updates to the plan of work in relation to the above deliverable would be addressed to the meeting in WP/09, which is discussed further at para. 6.1 to 6.4, below.

3.16. In view of the discussion above, the meeting also formulated the following Draft Conclusion:

Draft Conclusion MET/R WG/9/2 – Survey of State Meteorological Information Supporting Air Traffic Management:

That, the MET SG approve the proposed terms of reference (ToR) and the survey questionnaire and inform ATM SG/7 (in August 2020) and then circulate the survey questionnaire for States to respond in October/November 2020 or at an appropriate time.

4. MET information required to support end-user systems

Updates of Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations (WP/06)

4.1. The meeting reviewed progress of the designated ad-hoc group on the proposed updates to the *Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management (ATM) Operations*.

4.2. The meeting recalled that MET SG/23 had previously endorsed the above guidance as a reference for [use by] States and Organizations concerned (Conclusion MET SG/23/6, refers). This was also discussed in WP/02 and at para. 2.1 to 2.3 above.

4.3. However, subsequent to the MET SG's endorsement of the guidance, the meeting noted that the ad-hoc group proposes updates to the examples in Appendix 1 of the guidance to reflect recent developments in MET/ATM support activities in Hong Kong, China, Republic of Korea and Singapore. The ad-hoc group also proposed some changes of an editorial nature to the main part of the guidance.

4.4. The meeting noted that, while the format of Appendix 1 of the guidance currently purposefully supports the easy presentation of examples of MET/ATM support activities by States, it may need further revision in the future in order to accommodate the presentation of examples of more enhanced MET/ATM support activities in States.

4.5. In view of the discussion above, the meeting proposed that the ad-hoc group continues to take into consideration any further comments on the guidance from the MET/R WG, up until 12 June 2020, and then prepare a final version of the proposed updates to the guidance for presentation to and possible approval by MET SG/24.

4.6. Relevant updates by the meeting to the MET/R WG plan of work are proposed and highlighted under deliverable 4 in the plan of work at the **Appendix B** to this Report. The meeting also noted that the proposed updates to the plan of work in relation to the above deliverable would be addressed to the meeting in WP/09, which is discussed further at para. 6.1 to 6.4, below.

4.7. In view of the discussion above, the meeting also formulated the following Draft Conclusion:

Draft Conclusion MET/R WG/9/3 – Update on Regional Guidance for Tailored Meteorological Information and Services to Support ATM Operations

That, the MET SG approve the proposed updates to the *Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations*.

Encouragement to Transmit Special Air-Reports to Meteorological Watch Offices for Improvement of SIGMET (WP/07)

4.8. The meeting noted that the Collaborative SIGMET Issuance (CSI) scheme, conducted by States in the Southeast Asian region, enabled the participating meteorological watch offices (MWOs) to examine and compare the number of special air-reports received, in 2019, by the respective MWOs.

4.9. The CSI member States considered the special air-reports to be essential data for the process of preparing and evaluating SIGMET information – especially for severe turbulence and/or icing conditions. The comparison (of the number of special air-reports received) showed a huge contrast between Tokyo and all the other participating MWOs, as indicated in the table below:

MWO (FIR)	Number of received special air-reports in 2019		
	Turbulence	Icing	Thunderstorm
Bangkok (Bangkok)	89	3	0
Hanoi (Hanoi)	162	1	0
Ho Chi Minh (Ho Chi Minh)	70	0	2
Manila (Manila)	0	0	0
Tokyo (Fukuoka)	3502	76	43
Vientiane (Vientiane)	0	0	0
Yangon (Yangon)	0	0	0

4.10. The meeting noted the CSI member States had collectively recognized that the receipt of special air-reports varied greatly from State to State. Furthermore, the lack of special air-reports in some CSI member States resulted in significant difficulties in the preparation and evaluation of SIGMET information; in particular for severe turbulence and/or icing conditions, which, unlike other phenomena represented in SIGMET information, are generally very difficult to verify without reports from aircraft.

4.11. To improve the availability and reception of special air-reports, and hence MWOs' capabilities for the preparation and evaluation of SIGMET information, CSI member States recognized that cooperation between the MWOs, airlines and the air traffic services (ATS) units responsible for relaying special air-reports is essential.

4.12. The meeting recalled that similar discussion has occurred previously, in this and other relevant international forums, and noted that any progress the Group could facilitate on this issue would likely be beneficial to aviation safety in the CSI member States and elsewhere in the Region.

4.13. The meeting noted the importance of encouraging the exchange of special air-reports and suggested a number of actions, including an ICAO State letter highlighting the pilot and ATS unit responsibilities, which each State could then forward, as appropriate, to pilots and ATS units, to encourage the exchange of more special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices (AMOs)).

4.14. Recalling that the importance of the exchange of special air-reports is specifically reflected in the ICAO Asia/Pacific Regional SIGMET Guide para. 2.1.2, i.e., "... special air-reports are among the most valuable sources of information for the MWOs in the preparation of SIGMET ...", the meeting suggested that the ICAO APAC Office might further publicise the SIGMET Guide, especially to pilots and ATS units, in order to emphasize the importance of special air-reports for improved SIGMET service and flight safety (**Action agreed: 9/1**, at the **Appendix C** to this Report, refers).

Current status of Indonesian SIGMET Coordination with neighbouring FIRs (WP/08)

4.15. The meeting reviewed the progress, outcomes and plans of Indonesia with regards to the development of SIGMET coordination activities between Indonesia and its neighbouring States. Indonesia noted the ICAO Annex 3 (Amendment 79) provision (para. 3.4.4), with applicability date: 5 November 2020, which requires that an MWO should coordinate SIGMET with neighbouring MWO(s), especially when the en-route weather phenomenon extends or is expected to extend beyond the MWO's specified area of responsibility, in order to ensure harmonized SIGMET provision.

4.16. The meeting noted that Indonesia's specified area of responsibility borders with ten other neighbouring States' MWOs' areas of responsibility and that Indonesia was actively engaged in SIGMET coordination activities with most of those States and investigating expanding its SIGMET coordination efforts to include its remaining, neighbouring MWOs.

4.17. With reference to the earlier discussion at para. 2.1 to 2.3, above, on WP/03 and the relevant outcomes from MET SG/23, the meeting recalled that, as a result of the follow-up action by MET-Group Chairs on MET SG/23: task 23/02, concerning the next steps to promote integration and expansion of SIGMET coordination, the lead group taking action to support States with the implementation of SIGMET coordination activities is now the Meteorological Services Working Group (MET/S WG). Therefore, the meeting invited Indonesia to address its proposals regarding this matter to the MET/S WG (**Action agreed: 9/2**, at the **Appendix C** to this Report, refers).

Development of Meteorological Products for new ATC Operation in the Tokyo Approach Control Area (IP/01)

4.18. The meeting noted new ATM-tailored MET products launched by the Tokyo Metropolitan Area Team (TMAT) of the Japan Meteorological Agency (JMA) to support ATM operation by the Traffic Management Units (TMUs). Route-based and impact-based weather information is required and provided in the *Estimated convective CLOUD impact on AIR-routes* (ECLAIR) product, which is a numerical weather prediction (NWP)-based, automated product, adjusted by other manually processed products, that compensates for weaknesses in NWP forecasting. In addition, TMAT provides information on weather phenomena that could not be presented in deterministic forecasting, but may greatly impact air traffic based on the requirements from TMUs. It is important for MET officers to identify requirements of ATM officers and strive to improve MET service methods and information to support ATM operation.

Preparation of Tailored MET-ATM Implementation in Indonesia (IP/02)

4.19. The meeting noted MET information services tailored to the needs of ATM operation provided by BMKG (Indonesia). The system provides graphical representation of MET information, including categorized, impact-based weather information, to meet the needs of flight operations in Indonesia.

Introduction to the Web-Based Visibility and Weather Information at Indonesian Aerodromes for Aviation Users (IP/03)

4.20. The meeting noted the introduction of web-based visibility and weather information at Indonesian aerodromes provided through BMKG Indonesia's official website on aviation MET information. The website provides geographical representation of the weather information integrated with MET satellite imagery to support aviation users, in particular to set up flight plans, and for the take-off and landing operations.

Enhanced Capabilities of Aviation Thunderstorm Nowcast System (IP/04)

4.21. The meeting noted enhanced capabilities of the Aviation Thunderstorm Nowcast System developed by Hong Kong Observatory. Enhancements included increased period of weather forecast validity, customized overlay of weather information on significant way-points and routes, and vertical cross-section of weather radar imagery along significant routes. The system is designed to assist tactical decision making in ATC using rapid update, short period forecasts of thunderstorm impacts on airspace and ATC points and along routes.

5. Coordination between MET and ATM services

5.1. No papers discussed under this agenda item.

6. Review work programme and terms of reference

Review the Plan of Work (WP/09)

6.1. The meeting reviewed the plan of work to ensure the MET/R WG remains aligned with the broader objectives of the MET SG and APANPIRG.

6.2. Taking into account outcomes from the discussion on WP/03, WP/04, WP/05 and WP/06, which are already discussed elsewhere in the Report, above, the meeting agreed on a number of proposed updates to the plan of work with regards to the following deliverables:

- Deliverable 1 – concerning the guidance for SIGMET coordination in the Regional SIGMET Guide;
- Deliverable 2 – concerning the survey of MET information supporting ATM;
- Deliverable 4 – concerning the Regional Guidance for tailored MET to Support ATM;
- Deliverable 7 – concerning next steps to promote SIGMET coordination activities, and
- Deliverable 8 – concerning the development of Regional user-cases and user-requirements for SWIM-based MET information supporting ATFM.

6.3. On Deliverable 7, the meeting, in the presence of MET/S WG Chair, discussed that another ad-hoc group might need to be established to progress the work under the MET/S WG. The work to promote the integration and expansion of SIGMET coordination activities among

States/Administrations would require ongoing collaboration between the MET/S WG and MET/R WG. To further assist this work, the meeting welcomed the submission of relevant papers on user requirements for discussion at future meetings of the MET/R WG.

6.4. The proposed updates to the MET/R WG plan of work, based on outcomes of the above discussion, are highlighted at the **Appendix B** to this Report.

6.5. In view of the discussion above, the meeting adopted the following Decision:

Decision MET/R WG/9/4 – Updates to the Plan of Work

That, the MET/R WG adopts the proposed updates to the plan of work, as highlighted at the Appendix B to this Report.

7. Any other business

7.1. No papers discussed under this agenda item.

8. Next meeting

8.1. The meeting noted that the plan of work of MET/R WG includes, at deliverable 5, a seminar on regional implementation of MET information to support ATM operations. This was previously planned – as a MET/ATFM seminar in May 2020 – in conjunction with a joint plenary session of the MET/R WG/9 and ATFM SG/10 meetings. However, due to the global COVID-19 pandemic, ICAO, in conjunction with the respective Chairs, decided to postpone the proposed seminar until further notice.

8.2. Taking into account the ongoing uncertainty with regards to the ICAO’s, States’ and partner Organizations’ capacity to plan for and participate in a Regional seminar event in the near- to medium-term future, the meeting considered it appropriate to wait for the global pandemic situation to improve to develop more firm plans for the seminar.

8.3. Furthermore, the MET/R WG would need to wait for further advice from the MET SG and ATFM SG concerning the plan for the proposed MET/ATFM seminar.

8.4. In the meantime, the meeting decided to tentatively schedule the next meeting, MET/R WG/10, in approximately one-year (May 2021) and noted that this, too, would be subject to change, depending on the global situation.

APPENDIX A – AGREED UPDATES TO THE TERMS OF REFERENCE

MET/R WG/9, web-conference, 11 – 14 May 2020, agreed to the following updates to the MET/R WG terms of reference, which was previously updated by MET/R WG/8, Singapore, 30 – 31 May 2019:

Addendum: The Secretary removed the PIAWS Panel member from membership list (Ref: e-mail to ICAO, 15 May 2020)

Note: Updates to the MET/R WG terms of reference are arranged to show deleted text using ~~strikeout (text to be deleted)~~, and added text with grey shading (text to be inserted).

MET/R WG – TERMS OF REFERENCE

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

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

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DESCRIPTION	
	<p>the priorities defined in the ASIA/PAC Seamless ATM Plan;</p> <p>e) Promote coordination between the MET and ATM communities in the Asia/Pacific Region to enhance the level of understanding of MET requirements and capabilities in support of ATM; and</p> <p>f) Report to the MET SG for further co-ordination through the ICAO Secretariat with APANPIRG and other relevant bodies.</p>

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COMMUNICATION STRATEGIES				
Description	Target Audience	Delivery Method	Frequency / Date	Responsibility
Work Plan	MET/R WG, MET SG	Document via e- mail and MET/R WG meeting	As required, but reviewed at MET/R WG and MET SG meetings	Chair and Secretariat
General correspondence	MET/R WG Members	E-mail	As required	MET/R WG Members
MET/R WG Meeting	MET/R WG Members	Meeting (face-to- face or tele- /web-conference)	As required; may be supplemented by tele- web-conference	Chair and Secretariat
Status and Milestone Reports	MET/R WG Members	E-mail and working paper at MET/R WG meeting	At least annually	Chair and Secretariat
MET/R WG Report	MET SG (and ATM/SG, through MET SG) and all APAC States	ICAO website and working paper at MET SG meeting	Following each MET/R WG meeting	Chair and Secretariat

APPENDIX B – AGREED UPDATES TO THE PLAN OF WORK

MET/R WG/9, web-conference, 11 – 14 May 2020, agreed to the following updates to the MET/R WG plan of work, which was previously updated by MET/R WG/8, Singapore, 30 – 31 May 2019:

Note: Updates to the MET/R WG plan of work are arranged to show deleted text using strikethrough (~~text to be deleted~~), and added text with grey shading (text to be inserted).

MET/R WG – PLAN OF WORK

DELIVERABLES
1. Input to the draft update to the Regional SIGMET Guide to assist States in aligning cross-FIR-boundary SIGMET information in coordination with MET/S WG
2. Documented analysis of MET information used in the Region specifically to support ATM operations
3. Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan
4. Draft regional guidance material for tailored MET information supporting ATM operations
5. Seminar on regional implementation of MET information to support ATM operations
6. Coordinated review of the APAC ANP Volume III, including proposals for improvements to the ANRF and other parts of Volume III, to clarify the MET-related implementation planning guidance
7. SIGMET coordination activities in APAC Region; Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.
8. * Development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM

* Proposed updates arising from discussion on WP/03 – Review Outcomes from MET/R WG/8 and MET SG/23

MILESTONES	By date	Responsibility	Status
Deliverable 1: Input to the draft update to the Regional SIGMET Guide to assist States in aligning cross-FIR-boundary SIGMET information in coordination with MET/S WG			
1.1 Input to First draft of guidance for inclusion in Regional SIGMET Guide for review by MET/R WG members (taking into consideration lessons learnt from the SIGMET coordination projects occurring in the Region)	next meeting of MET/R WG	Ad hoc group 1: Japan, Singapore and Secretariat in coordination with MET/S WG	Completed
1.2 First draft of guidance for inclusion in Regional SIGMET Guide for review by MET SG	MET SG/22	Secretariat in coordination with MET/S WG, MET SG	Completed
1.3 Submit the latest version of the guidance for possible approval by MET SG	MET SG/23	Ad hoc group 1: Japan, Singapore and Secretariat in coordination with MET/S WG	In progress Closed-Completed
*1.4 Review the guidance and propose updates as necessary for possible approval by MET SG [MET SG/23 task: 23/12, tasked the MET/S WG (rather than the MET/R WG) to keep the guidance under review and propose updates as necessary]	*meeting of MET/R WG	*Ad hoc group 1: Japan, Singapore and Secretariat in coordination with MET/S WG	*To begin Closed-Redundant

* Proposed updates arising from discussion on WP/03 – Review Outcomes from MET/R WG/8 and MET SG/23

MILESTONES	By date	Responsibility	Status
Deliverable 2: Analysis of MET information used in the Region specifically to support ATM operations			

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2.1 Survey on regional requirements for MET information to support ATM operations	Oct/Nov 2015	Secretariat	Completed
2.2 Preliminary draft documented analysis of MET information used in the Region specifically to support ATM operations	Jun 2016	Secretariat and Chair	Completed
2.3 Final draft documented analysis of MET information used in the Region specifically to support ATM operations	Next meeting	Ad hoc group 2: Australia (Rapporteur), Singapore, New Zealand, China, Japan, Thailand, Hong Kong China, Viet Nam	Completed
2.4 Develop a revised questionnaire and conduct a survey, taking into account outcomes from the review of the survey results by the MET SG and ATM/SG and how this can support the next MET/ATM seminar	By 10 June 2019	Ad hoc group 2	* In progress Closed-Completed
2.5 Submit draft survey questionnaire to MET SG/23 for approval	By 10 June 2019 for MET SG/23 on 17 June	As above	* In progress Closed-Completed
* [Revise the follow-up action on Decision MET/R WG/8/4 – <i>Survey of State Meteorological Information Supporting Air Traffic Management</i> , taking into account additional proposals to be presented in MET/R WG/9: WP/05 – <i>Survey of State Meteorological Information Supporting Air Traffic Management</i>] Note: this row will be removed after agreement by the meeting on the points below		*As above	*In progress
# 2.6 Revise questionnaire taking into account outcomes from MET/R WG/9 and further feedback and comments from the WG members	#29 May 2020	#As above	#To begin
#2.7 Conduct a small trial-run of the survey questionnaire	#29 Jun 2020	#As above	#To begin
#2.8 Submit final draft survey questionnaire to MET SG/24 for approval	#29 Jun 2020	#As above	#To begin
#2.9 Conduct the Regional survey	#Q3-4 2020 or as decided by MET SG	#As above	#To begin

* Proposed updates arising from discussion on WP/03 – *Review Outcomes from MET/R WG/8 and MET SG/23*
Proposed updates arising from discussion on WP/05 – *Survey of State Meteorological Information Supporting Air Traffic Management*

MILESTONES	By date	Responsibility	Status
Deliverable 3: Draft regional guidance material on MET information needed to support the elements of the APAC Seamless ATM Plan			
3.1 First draft of a list on the MET information or services necessary to support implementation of each element of the Asia/Pacific Seamless ATM Plan	Jul 2016 ATM/SG	Ad hoc group 3: Australia, China, Hong Kong, China, and Japan, Thailand, Singapore (Rapporteur)	Completed

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3.2 Revise the draft list and present to ATM/SG/5	17 July 2017	Ad hoc group 3	Completed
3.3 Further development pending outcomes of ICAO A40 review of GANP 2019	TBD	TBD	On hold

MILESTONES	By date	Responsibility	Status
Deliverable 4: Draft regional guidance material for tailored MET information supporting ATM operations			
4.1 List of tailored MET information or services used in the region to support ATM operations	Jun 2016	Ad hoc group 4: Australia, China, Hong Kong, China, IATA, Japan (Rapporteur), Republic of Korea, Singapore, Thailand and Viet Nam	Completed
4.2 List of sub-regional exchange of MET information and associated agreements that facilitate ATM operations, particularly where major traffic flows affect multiple FIRs	Jun 2016	As above	Completed
4.3 First draft of regional guidance material for tailored MET information supporting ATM operations	Aug 2016	As above	Completed
4.4 Draft of version 2 produced, based on survey results and outcomes/recommendations provided by MET SG and/or ATM/SG	Jun 2018	As above	* In progress Completed
4.5 Submit the regional guidance material for tailored MET information supporting ATM operations for possible approval by MET SG and inform the ATM/SG	By 10 June 2019 for MET SG/23 on 17 June	As above	* To begin Closed- Completed
4.6 Review the regional guidance material for tailored MET information supporting ATM operations and propose updates as necessary for possible approval by MET SG	Next meeting of MET/R WG	As above	† To begin Closed- Completed
†4.7 Review the working draft guidance and provide comment to the ICAO RO MET	†12 June 2020	†MET/R WG	†To begin
†4.8 Finalize the updated guidance for approval at the MET SG in July 2020	†29 June 2020	†Ad-hoc group, consisting of Australia, China, Hong Kong, China, Japan (rapporteur), Republic of Korea, Singapore, Thailand, Vietnam and IATA	†To begin

* Proposed updates arising from discussion on WP/03 – *Review Outcomes from MET/R WG/8 and MET SG/23*
† Proposed updates arising from discussion on WP/06 – *Updates of Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations*

MILESTONES	By date	Responsibility	Status
Deliverable 5: Seminar on regional implementation of MET information to support ATM operations			
5.1 Plan for future seminar on regional implementation of MET information to support ATM operations (May 2020) – initial proposal for MET SG/23 to consider	By 10 June 2019 for MET	Chair and Secretariat (organizing committee)	To begin On hold pending further

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	SG/23 on 17 June		advice from MET SG
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MILESTONES	By date	Responsibility	Status
Deliverable 6: Coordinated review of the APAC ANP Volume III, including proposals for improvements to the ANRF and other parts of Volume III, to clarify the MET-related implementation planning guidance			
6.1 First draft of proposed APAC ANP Volume III improvements (pending outcomes from the ICAO eANP WG development on ANP Vol III common template)	TBD	TBD	On hold

MILESTONES	By date	Responsibility	Status
Deliverable 7: SIGMET coordination activities in APAC Region; Coordinate on the next steps to promote integration and expansion of SIGMET coordination activities among States/Administrations.			
*7.1 Consolidated progress report on SIGMET coordination activities in the APAC Region and recommendations based on lessons learnt: – new and existing SIGMET coordination activities – WP (MET/R WG) and SP (MET/ATM Seminar) – key lessons learnt/recommendations for regional guidance on SIGMET coordination – identify opportunities for integration and expansion of SIGMET coordination activities [Revise the deliverable to focus on determining the end-users’ requirements; and taking into account the additional proposals to be presented in MET/R WG/9: WP/09 – <i>Review and update of the Work Programme</i>]	*Next meeting of MET/R WG and MET/ATM Seminar	*Ad-hoc group (Japan and Singapore, Hong Kong China, Malaysia, India, Viet Nam, Thailand, Fiji, IFALPA...) coordinated by the Chairperson and Secretary MET-group Chairs considered this task is more appropriate to be included under the work plan of MET/S WG	*To begin

* Proposed updates arising from discussion on WP/03 – *Review Outcomes from MET/R WG/8 and MET SG/23*

MILESTONES	By date	Responsibility	Status
*Deliverable 8: Development of APAC Use Case and User Requirements for SWIM-based MET Information Services Supporting ATFM			
*[Establish a new deliverable taking into account the proposals to be presented in MET/R WG/9: WP/04 – <i>APAC User Requirements for SWIM-based MET Information Services Supporting ATFM</i>] Note: this row will be removed after agreement by the meeting on the points below		*An ad-hoc group comprising SMEs from both MET/R WG and ATFM/SG	*To begin
**8.1 In coordination with SWIM TF, identify and develop the specifications of future SWIM-based MET information services required to support ATFM operations		**Ad-hoc group 8 (see below)	**To begin
**8.2 Identify MET and ATFM data to be exchanged using SWIM-based Information Exchange Service		**Ad-hoc group 8 (see below)	**To begin
**8.3 Based on the findings (above), develop APAC use cases and user requirements document for future SWIM-based MET information services supporting ATFM		**Ad-hoc group 8 (see below)	**To begin

* Proposed updates arising from discussion on WP/03 – *Review Outcomes from MET/R WG/8 and MET SG/23*

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** Proposed updates arising from discussion on WP/04 – APAC User Requirements for SWIM-based MET Information Services Supporting ATFM

Ad-hoc group 8

State / Administration / IO	NamePosition	Position and/or Organisation	Expertise
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Australia	Ashwin Naidu	BOM	MET
CANSO	Stuart Ratcliffe	CANSO	ATFM
Hong Kong China	Marco Kok	HKO	MET/SWIM
Hong Kong China	(Rapportuer) Peter Chadwick	Senior Air Traffic Control Specialist (Strategic Planning) / HKCAD	ATFM
Hong Kong China	(Mr) Anfernee Poon	Project Officer / HKCAD	ATFM
IATA	John Moore	IATA	ATFM/MET
Japan	SHIGENOBU Toshiya	JCAB	ATFM
Japan	YASUI Kazuki	JMA	MET
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APPENDIX C – AGREED ACTIONS

MET/R WG/9, web-conference, 11 – 14 May 2020, agreed to the following actions:

MET/R WG – AGREED ACTIONS

TASK No.	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS/ REMARKS
9/1	Publicise the SIGMET Guide and, in particular, the guidance indicating the importance of exchanging special air-reports between airlines, ATS units and MWOs (and aerodrome meteorological offices (AMOs)) in support of improved SIGMET service and flight safety, by way of ICAO State letter (and/or other channels) with distribution to pilots and ATS units supported by States and relevant organizations, as appropriate.	July 2020	Secretary and MET/R WG members	To begin
9/2	Present a paper on Indonesia's proposals to expand SIGMET coordination activities between neighbouring MWOs to the MET/S WG	12 June 2020	Indonesia and Secretary	In progress

LIST OF PAPERS AND PRESENTATIONS

WP/IP/ DP No.	Agenda item	Subject	Presented by
WORKING PAPERS			
WP/1	1	Adoption of the Agenda	Secretariat
WP/2	1	Review the Terms of Reference	Secretariat
WP/3	2	Review Outcomes from MET/R WG/8 and MET SG/23	Secretariat
WP/4	3	APAC User Requirements for SWIM-based MET Information Services Supporting ATFM	Australia, Hong Kong China, and Thailand
WP/5	3	Survey of State Meteorological Information Supporting Air Traffic Management	Ad- hoc Group
WP/6	4	Updates of Asia/Pacific Regional Guidance for Tailored Meteorological Information and Services to Support Air Traffic Management Operations	Ad-hoc Group
WP/7	4	Encouragement to Transmit Special Air-Reports to Meteorological Watch Offices for Improvement of SIGMETs	Japan, Lao PDR, Myanmar, Philippines, Thailand and Viet Nam
WP/8	4	Current status of Indonesian SIGMET Coordination with neighbouring FIRs	Indonesia
WP/9	6	Review the Plan of Work	Secretariat
INFORMATION PAPERS			
IP/1	4	Development of Meteorological Products for new ATC Operation in the Tokyo Approach Control Area	Japan
IP/2	4	Preparation of Tailored MET-ATM Implementation in Indonesia	Indonesia
IP/3	4	Introduction to the Web-Based Visibility and Weather Information at Indonesian Aerodromes for Aviation Users	Indonesia
IP/4	4	Enhanced Capabilities of Aviation Thunderstorm Nowcast System	Hong Kong, China
DISCUSSION PAPERS			
DP/1	8	Proposal for Next Meeting	Secretariat

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