INTERNATIONAL CIVIL AVIATION ORGANIZATION ASIA AND PACIFIC OFFICE

REPORT OF

THE NINETEENTH MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/19) OF APANPIRG

03 – 06 August 2015
Bangkok, Thailand

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

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

HISTORY OF THE MEETING

REPORT ON AGENDA ITEMS

LIST OF ATTACHMENTS

1. Introduction

1.1 The Nineteenth Meeting of the Meteorology Sub-group (MET SG/19) of the Asia/Pacific (APAC) Air Navigation Planning and Implementation Regional Group (APANPIRG) was held at the International Civil Aviation Organization – APAC Office in Bangkok, Thailand from 3 to 6 August 2015.

2. Attendance

2.1 The meeting was attended by 56 experts from Australia, Bangladesh, China, Hong Kong-China, Macao-China, Indonesia, Japan, Lao (Peoples Democratic Republic), Malaysia, Maldives, New Zealand, Pakistan, Philippines, Republic of Korea, Thailand, United Kingdom, United States, International Air Transport Association (IATA), International Federation of Airline Pilot's Associations (IFALPA), World Meteorological Organization (WMO) and the International Civil Aviation Organization (ICAO). The List of Participants is provided at **Attachment 1** to this Report.

3. Chair and Secretariat

3.1 Ms. Sue O'Rourke presided over the meeting in the role as chairperson and was assisted by Dr. Cheng Cho Ming in the role as vice chairperson. Mr. Peter Dunda, ICAO Regional Officer for Aeronautical Meteorology, acted as secretary of the meeting.

4. Organization and language of the meeting

4.1 The meeting met as a single body. The working language was English, including all documentation. The meeting considered 24 working papers, 29 information papers, 2 special presentations and 7 flimsies. A list of papers is provided at **Attachment 2** to this Report.

5. Draft Conclusions, Draft Decisions and Decisions

5.1 The MET SG recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

a) Draft Conclusions deal with matters that, according to APANPIRG terms of reference, require the attention of States, or action by the ICAO, in accordance with established APANPIRG procedures;

b) Draft Decisions deal with the matters of concern only to APANPIRG and itscontributory bodies; and

c) Decisions relate solely to matters dealing with the internal working arrangements of the MET SG.

Draft Conclusions

5.2 MET SG/19 formulated the following 9 Draft Conclusions:

Draft Conclusion 19/3 — SIGMET Training

Draft Conclusion 19/5 — SADIS user States and SADIS users to prepare for cessation of SADIS 2G

Draft Conclusion 19/7 — Tropical Cyclone Advisory (TCA) and SIGMET messages

Draft Conclusion 19/13 — Improvement of OPMET data availability for aerodromes listed in AOP tables and aerodromes not listed in AOP tables

Draft Conclusion 19/14 — IWXXM and AMHS Survey

Draft Conclusion 19/15 — Capacity building workshop to facilitate planning and implementation of digital exchange of aeronautical meteorological information

Draft Conclusion 19/16 — Survey of State Meteorological Information Supporting Air Traffic Management

Draft Conclusion 19/17 — Competency of aeronautical meteorological personnel

Draft Conclusion 19/18 — SIGMET Pamphlets

Draft Decisions

5.3 MET SG/19 formulated no Draft Decisions.

Decisions

5.4 MET SG/18 formulated the following 11 Decisions:

Decision 19/1 — MET SG Terms of Reference

Decision 19/2 — Expert working groups of the Meteorology Sub-group (MET SG)

Decision 19/4 — SIGMET Deficiencies in the APAC Region

Decision 19/6 — Darwin TCAC Boundary

Decision 19/8 — Tropical Cyclone Advisory (TCA) messages

Decision 19/9 — Back up of TCACs

Decision 19/10 — WMO Abbreviated Headers for VAAC Wellington/Tokyo backup of VAAC Darwin

Decision 19/11 — Change to Darwin VAAC telephone number

Decision 19/12 — Observations including air-reports of VA

Decision 19/19 — SIGMET Pamphlets

Decision 19/20 — Regional guidance on SIGMET (radioactive cloud)

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Agenda Item 1: Opening of the meeting

1.1 Mr. Peter Dunda, ICAO Regional Officer for Aeronautical Meteorology, welcomed all participants on behalf of the ICAO Regional Director, Mr. Arun Mishra.

Agenda Item 2: Organizational matters

WP/01 — Provisional Agenda

2.1 The meeting adopted the provisional agenda, which was distributed prior to the meeting, and noted that under Agenda Item 6.3*: MET/ATM coordination*, discussions would cover similar issues to the meteorology-related agenda item of the Third Meeting of the Air Traffic Management Sub-group (ATM/SG/3), which was being held concurrently in the ICAO APAC Regional Office (i.e., at Agenda Item 6: AOP, MET, AIM, SAR).

2.2 The agenda was adopted by the meeting as follows:

Agenda Item 1: Opening of the meeting
Agenda Item 2: Organizational matters
Agenda Item 3: Review outcomes from other ICAO groups
Agenda Item 4: Planning and monitoring
Agenda Item 5: Air navigation deficiencies in the MET field
Agenda Item 6: Research, development and implementation issues in the MET field
- 6.1 WAFS (including WAFS TF Report)
- 6.2 Observations and reports
- 6.3 Forecasts, advisories and warnings (including MET/H TF Report)
- 6.4 OPMET exchange (including ROBEX WG Report)
- 6.5 MET/ATM coordination (including MET/R TF Report)
- 6.6 Climatological information
- 6.7 Governance and training (incl. quality management, cost recovery, qualification and competencies of meteorological personnel)
- 6.8 Other

Agenda Item 7: Regional guidance material
Agenda Item 8: Future work programme
Agenda Item 9: Any other business

Order of business

2.3 The Secretariat proposed an order of business for the meeting as provided at the meeting website (http://www.icao.int/APAC/Meetings/Pages/2015-METSG19.aspx). The meeting noted that the MET SG discussions were expected to finish on day 4 of the meeting; enabling MET SG participants to attend the concurrent ATM/SG/3 meeting and observe the scheduled ATM/SG/3 discussions related to MET/ATM coordination (as discussed above; 2.1 refers).

IP/01 — Terms of reference of the Meteorology Sub-group

2.4 The Secretariat provided an overview of the current terms of reference for the MET SG but noted that there had been a recent review of these by APANPIRG and this would be

discussed in IP/19. *Note: IP/02 and WP/02 under agenda item 2 were discussed as part of agenda item 3.*

Agenda Item 3: Review outcomes from ICAO groups

IP/03 — Eighteenth Meeting of the Meteorology Sub-group

3.1 The Secretariat provided an overview of follow-up to MET SG/18, which included 6 Draft Conclusions and 4 Decisions.

Draft conclusion 18/2 – Follow-up to APANPIRG/24 decisions and conclusions

Draft Conclusion 18/4 – Improvement of OPMET data format

Draft conclusion 18/6 – Initiatives to reduce deficiencies in SIGMET information

Draft Conclusion 18/7 – Improvement of OPMET data availability for AOP aerodromes, and for non-AOP aerodromes listed in FASID Table MET 2A

Draft conclusion 18/8 – Establishment of a volcanic ash exercises steering group in the APAC region

Draft conclusion 18/9 – APAC MET/ATM seminar

Decision 18/1 – Follow-up to MET SG/17 decisions

Decision 18/3 – Status of OPMET provision in Bhutan

Decision 18/5 – Updates to the requirements for WIFS of APAC States

Decision 18/10 – Contact information for approving officials in WIFS user States

IP/04 — Twenty Fifth Meeting of the APANPIRG

3.2 The Secretariat provided an overview of APANPIRG/25 which included 9 Conclusions and 5 Decisions that can be considered of direct or indirect relevance to the MET SG.

Conclusion 25/2 – APAC Regional Air Navigation Priorities and Targets

Conclusion 25/3 – Air Navigation Report Forms (ANRFs) and Responsibility Matrix

Conclusion 25/4 – Seamless ATM Implementation Guidance

Conclusion 25/14 – Access to ICAO Annexes and Documents

Conclusion 25/43 – Promote Understanding of SWIM in APAC Region

Conclusion 25/45 – Improvement of OPMET Data Format

Conclusion 25/46 – Improvement of OPMET Data Availability for Aerodromes Listed in ANP FASID Table MET 2A

Conclusion 25/48 – APAC MET/ATM Seminar

Conclusion 25/49 – Update of ATM/AIS/SAR, AOP, CNS and MET Deficiency List

Decision 25/1 – Development of the New APAC eANP

Decision 25/10 – ATFM/SG Terms of Reference

Decision 25/12 – Amend Regional ATM Contingency Plan Task Force (RACP/TF) Terms of Reference

Decision 25/47 – Establishment of a Volcanic Ash Exercises Steering Group in the APAC Region

Decision 25/50 – APANPIRG Contributory Bodies Structure Review Task Force (ABSRTF)

IP/05 — Review of the first meeting of the ICAO Meteorology Panel

3.3 The ICAO Meteorology Panel (METP) conducted its first meeting in Montréal from 20-24 April 2015. The METP agreed to a structure that included four (4) working groups and an ad hoc group as follows:

- Working Group on Meteorological Requirements and Integration (WG-MRI);
- Working Group on Meteorological Information and Service Development (WG-MISD):
    - Radioactive Material Sub-group;
    - World Area Forecast System Sub-group;
    - Volcanic Ash Sub-group;
    - Space Weather Sub-group; and
    - Regional Hazardous Weather Advisory Centres Sub-group;
- Working Group on Meteorological Information Exchange (WG-MIE);
- Working Group on Meteorological Operations Group (WG-MOG); and
- Ad hoc group on Cost Recovery.

3.4 Some members and advisers of the METP were present at MET SG/19 and it was noted that APAC States have nominated members and/or advisers in each working group of the METP. In response to an observation from the WMO that the METP represents a completely new structure for ICAO's meteorology-related work at the global level, the Secretariat clarified that the existing coordination strategies would still be effective in so far that suggestions promulgated through APANPIRG concerning the ICAO world-wide provisions and related issues would be submitted to the Air Navigation Commission (ANC) for consideration and further action as necessary, e.g. through the work programme of the ANC Panels including METP as appropriate.

IP/19 — Second meeting of the APANPIRG contributory bodies structure review task force

3.5 APANPIRG/25 established an APANPIRG contributory bodies structure review task force (ABSRTF) to align its working arrangements with the revised Global Air Navigation Plan (GANP). APANPIRG noted that in light of the performance based approach to air navigation planning and implementation there is a need to align the work programme of States, Regions and ICAO and as such due consideration should be given to planning, implementation, and performance measurement, monitoring and reporting aspects and that a project based approach. The Second Meeting of the ABSRTF (ABSRTF/2), which was held in Bangkok, Thailand from 24 to 25 June 2015, formulated the following Draft Decisions:

- Draft Decision ABSRTF/2/1 — Empowerment of Sub Groups
- Draft Decision ABSRTF/2/2 — Reorganization of APANPIRG Structure
- Draft Decision ABSRTF/2/3 — Revised Terms of Reference of APANPIRG Sub Groups
- Draft Decision ABSRTF/2/4 — Review Terms of Reference of Contributory Bodies under the APANPIRG Sub Groups
- Draft Decision ABSRTF/2/5 — Dissolution of ABSRTF

3.6 In response to a query from the United States on the intention of the deliverable No. 6 under the proposed terms of reference of the MET SG (MET SG/19, IP/19, par. 2.2 refers), the Secretariat clarified that the reference to *"research and development, trials and demonstrations in the field of MET and other relevant areas"* is to be taken in the context of the APANPIRG objective to *facilitate the implementation of air navigation systems and services* and, as such, should not be taken to mean that the MET SG *conducts* research and development, trials and demonstrations in the field of meteorology and other relevant areas, but rather that it *monitors* these and *facilitates* the transfer of this information and expertise in order to *facilitate implementation* of appropriate aeronautical meteorological services.

3.7 The meeting noted that the ABSRTF/2 Draft Decisions had been circulated to Chairpersons of APANPIRG contributory bodies for review and comments prior to adoption at ABSRTF/2. Nonetheless the meeting agreed that objective No. 3 under the proposed terms of reference of the MET SG (MET SG/19, IP/19, par. 2.2 refers), and other Sub-groups of APANPIRG, could be improved and would better reflect the safety-related benefit of addressing deficiencies if the objective included the word "effective" in addition "efficient" to describe the meteorological services. The meeting requested the Secretariat to consult with the other APANPIRG Sub-groups with respect to possible revision of the Draft Decision ABSRTF/2/3 – *Revised Terms of Reference of APANPIRG Sub Groups.*

Decision 19/1 — MET SG Terms of Reference

That, to promote safety-related objectives of APANPIRG, the word "effective", in addition to "efficient", should be considered for inclusion in the terms of reference proposed by Draft Decision ABSRTF/2/3 – *Revised Terms of Reference of APANPIRG Sub Groups* (at the third dot point under the objectives) with respect to the objective of addressing deficiencies in the respective air navigation services related to each Sub-Group of APANPIRG.

3.8 Regarding the coordination between APANPIRG Sub Groups, the MET SG Chair noted that the APANPPIRG Sub Group chairs and the relevant ICAO Secretariat had been conducting ad hoc teleconferences when necessary and had also agreed to meet directly after APANPIRG meetings to discuss activities and projects of each group that would require coordination across Sub Groups.

IP/02 — Project Management Principles

3.9 A set of project management principles proposed to guide the work programmes of the contributory bodies of APANPIRG was reviewed by ABSRTF/2, held in Bangkok, Thailand, 24 to 25 June 2015 (ABSRTF/2, WP/4, Attachment F, refers). The ABSRTF noted that further review to the project management principles would be needed before they are submitted to the APANPIRG/26.

WP/02 — Meteorology Sub-group structure

3.10 It was proposed that the MET SG task forces and working group be modified to better align with the new METP working groups and to allow a more streamlined working arrangement to complete deliverables relating to the GANP, Aviation System Block Upgrades (ASBU) and APAC regional priorities. The proposed new groups are as follows:

- Meteorological Requirements Working Group (MET/R WG);
- Meteorological Services Working Group (MET/S WG);
- Meteorological Information Exchange Working Group (MET/IE WG).

3.11 In response to a query, the WMO noted that discussion was underway between the WMO and ICAO Secretariat with respect to clarification of global provisions related to competency of personnel in meteorological service provision. The Chair noted that regional activities concerning implementation of competency-related provisions would sit with the MET/S WG under the proposed new structure of MET SG.

3.12 In response to another query concerning scheduling of activities of the proposed new WGs of MET SG, the Chair noted that meetings of the Meteorological Services Working Group (MET/S WG) and Meteorological Information Exchange Working Group (MET/IE WG) could be held back-to-back in 2016 – as has been done previously with the Regional OPMET* Bulletins Exchange Working Group (ROBEX WG) and Meteorological Hazards Task Force (MET/H TF).

3.13 Considering that cost recovery- and quality management-related issues are relevant to a broad range of the meteorological services governed by ICAO provisions, the meeting noted that the MET SG itself would be the most appropriate level at which to address these issues in the context of Regional planning and implementation, e.g., facilitation of cost recovery principles to meteorological service for international air navigation and assistance with transition from quality management system (QMS) to safety management system (SMS) in relation to meteorological services.

3.14 WMO noted that progress across regions with respect to implementation of QMS-related provisions for aeronautical meteorological service is supported within WMO members by the WMO special task team on QMS, though, currently, there is no similar WMO group specifically addressing SMS implementation issues.

3.15 The proposal to restructure the contributory bodies of MET SG (as discussed above) was supported; furthermore, Japan noted the importance of minimizing the number of groups (as far as possible) due to logistical considerations including time, financial and personnel resources of the member States.

3.16 The meeting noted that the newly established volcanic ash exercises steering group (APAC VOLCEX/SG) would remain as a separate group (under the MET SG) and retain its cross-disciplinary nature (i.e., relevant to both MET SG and ATM SG), but would report to the MET/S WG as the primary point for coordination.

* Operational meteorological (information)

3.17 In response to a query from WMO, the Chair noted that the level of detail of project-management principles that would be adopted within the working arrangements of the new groups would be commensurate with the size and scope of the tasks to be undertaken.

3.18 An ad hoc group was formed to review the terms of reference of the three new working groups. The terms of reference of the proposed working groups agreed to by the MET SG are provided at **Attachment 3** to this Report. The meeting supported the proposal and adopted the following Decision:

Decision 19/2 — Expert working groups of the Meteorology Sub-group (MET SG)

That, in order to assist APANPIRG with its planning and implementation work in close alignment with the Global Air Navigation Plan (GANP) and Aviation System Block Upgrade (ASBU) strategies and the APAC regional priorities, and to facilitate coordination, where necessary, with the Meteorology Panel:

a) The following expert working groups be appointed to replace the existing structure of expert task forces and working group under the MET SG:
   i. Meteorological Requirements Working Group (MET/R WG)
   ii. Meteorological Services Working Group (MET/S WG)
   iii. Meteorological Information Exchange (MET/IE WG); and

b) The draft terms of reference for the working groups under the MET SG, as contained in **Attachment 3** to this Report, be adopted.

Note: The Volcanic Ash Exercises Steering Group (APAC VOLCEX/SG) will report to the MET/S WG.

3.19 Considering that the proposed new working groups would undertake the tasks assigned by the current groups under the MET SG (WP/02, paragraphs 2.5-2.7 refer), i.e., the Meteorological Requirements Task Force (MET/R TF), World Area Forecast System Task Force (WAFS TF), MET/H TF and ROBEX WG, the meeting noted that it would be appropriate for the existing memberships of the expert groups to be transferred over to the corresponding new working groups as follows:

- MET/R TF → MET/R WG
- MET/H TF and WAFS TF → MET/S WG
- ROBEX WG → MET/IE WG

Agenda Item 4: Planning and monitoring

WP/04 — APAC air navigation plan

4.1 The meeting provided a number of additional updates to the (meteorology parts of the) draft new APAC air navigation plan (ANP) based on the electronic air navigation plan (eANP) template; these are incorporated at **Attachment 4** to this Report intended for further review and possible endorsement by APANPIRG/26.

4.2 Additional changes to the draft new ANP suggested by the meeting include:

- VOL I, 2.1: Alternative wording to clearly distinguish between the SADIS[*] 2G[†], Secure SADIS FTP[‡] and WIFS[§] services[**]
- VOL I, 2.3: Add Anchorage, Toulouse and Washington to list of VAACs designated to prepare VA advisory information for the APAC Region
- VOL I, 2.5: Add Reunion to list of TCACs designated to prepare TC advisory information for the APAC Region
- VOL II, 2.2: Reinstate original wording to enable METAR[††] at intervals of one half-hour if so determined by regional air navigation agreement
- VOL II, 2.8: Alternative wording to clearly identify the AFS satellite distribution system as SADIS 2G
- Table MET II-1: Correct column 9 to indicate AIRMET[‡‡]
- Table MET II-2: Remove column 8 regarding State of the Runway
- Table MET II-2: Remove requirement for 9H TAF[§§] from column 10, to provide consistency with the removal of 9H TAF from VOL II, 2.5 (as indicated in WP/04)
- Table MET II-2: Add requirement for 12H TAF in column 10, to provide consistency with the addition of 12H TAF in VOL II, 2.5 (as indicated in WP/04)
- Throughout: Add note indicating that the SADIS 2G Service will be withdrawn on 31 July 2016.

4.3 A query was raised about the absence of data in the new ANP (e.g., in the tables), which currently is provided in the existing ANP, Volume II, Facilities and Services Implementation Document (FASID) Tables MET 3A and 3B (i.e., data corresponding to the designated tropical cyclone advisory centres (TCACs) and volcanic ash advisory centres (VAACs) in the APAC Region including: ICAO location indicator, area of responsibility, period of operation and identification of the meteorological watch offices (MWOs)/area control centres (ACCs) to which advisory information should be sent).

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[*] Satellite distribution system for information relating to air navigation (SADIS) (provided by the United Kingdom)
[†] SADIS 2nd generation (2G) service
[‡] SADIS file transfer protocol (FTP)
[§] WAFS internet file service (WIFS) (provided by the United States)
[**] SADIS – Satellite distribution system for information relating to air navigation
[††] Aerodrome routine meteorological report
[‡‡] Information issued by a meteorological watch office concerning the occurrence or expected occurrence of specified en-route weather phenomena which may affect the safety of low-level aircraft operations and which was not already included in the forecast issued for low-level flights in the flight information region concerned or sub-area thereof.
[§§] Aerodrome forecast

4.4 At least two States present (Lao PDR* and Australia) would provide additional changes required to align the data in (eANP) Table MET II-2 with current requirements.

IP/09 — Updates to OPMET-related FASID tables

4.5 In relation to the proposed updates to the FASID Tables (MET) presented in IP/09, New Zealand advised that, as a result of recent investigations related to SIGMET issuance in the equatorial region of the Pacific, it is apparent that (aside from the notes currently contained in the FASID) there is no formal, documented agreement in place between Papua New Guinea and Nauru for the provision of SIGMET service on behalf of Nauru. Therefore, the existing FASID Tables MET 1B, 3A and 3B, which are currently annotated to specify that SIGMET service is provided by Papua New Guinea on behalf of Nauru, would require changes to more accurately reflect the current requirements in this respect, i.e., delete references to an arrangement made for issuance of SIGMET (on behalf of Nauru) by Port Moresby MWO.

4.6 Australia provided additional updates at the meeting for FASID Table MET 1A to reflect the current requirements for meteorological service required at aerodromes in Australia (Flimsy 07 refers). An updated proposal for amendment of FASID Tables (MET) including the additional changes discussed by the meeting is provided at **Attachment 5** to this Report.

IP/06 — Air Navigation Reporting Form

4.7 On request by the Chair, a special breakout group revised the content of the APAC air navigation reporting form (ANRF) for B0-AMET†, which is provided at **Attachment 6** to this Report.

IP/07 — Regional Priorities and Targets

4.8 The meeting noted that APANPIRG/25 reviewed and endorsed the ten regional priorities, targets and indicators for air navigation system implementation proposed by the Chairpersons of the APANPIRG Sub-Groups; following some revision including consideration of Regional ASBU priorities, APAC Seamless ATM Plan priorities and additional civil-military issues (APANPIRG Conclusion 25/2 – APAC Regional Air Navigation Priorities and Targets, refers).

IP/08 — Seamless ATM Plan

4.9 The meeting noted that the Seamless ATM Implementation Guidance, Version 4.3, May 2014, was adopted by APANPIRG/25 to support implementation of the APAC Seamless ATM Plan, (APANPIRG/25 — Conclusion 25/4 refers).

4.10 The APAC Seamless ATM Plan, which is divided into two phases, contains Phase I element, No. 310 – *Meteorological Information (B0-AMET),* with expected implementation by 12 November 2015. This element (of the Seamless ATM Plan) is of direct relevance to the work programme of the MET SG; it contains the following specifications:

* Lao People's Democratic Republic

† Block zero (B0) of the ASBU thread "Advanced Meteorological Information" (AMET); B0-AMET: Meteorological information supporting enhanced operational efficiency and safety

7.26 All high density aerodromes should provide meteorological forecasts, aerodrome warnings and alerts that support efficient terminal operations.

7.39 ATM systems should be supported by implementation of appropriate meteorological information reporting systems, providing, inter-alia, observations, forecasts, warnings and alerts, and also provide for information to meteorological authorities or offices where required.

Agenda Item 5: Air navigation deficiencies in the MET field

WP03 — APANPIRG list of air navigation deficiencies in the MET field

5.1 The meeting reviewed the list of meteorological service-related deficiencies in the APANPIRG database and noted the progress being made in some States towards implementation of corrective actions. A summary of the current meteorological service-related deficiencies (presented in the APANPIRG reporting form on air navigation deficiencies) is provided at **Attachment 7** to this Report.

WP/06 — Improvement of SIGMET availability in the APAC Region

5.2 The meeting was pleased to note that in 2014, for the first time, Papua New Guinea and Solomon Islands participated in the annual APAC SIGMET tests. The meeting noted, however, that the test SIGMET messages issued by Papua New Guinea and Solomon Islands contained some notable errors.

5.3 Non-uniform availability of Papua New Guinea-issued SIGMET messages, as reported by the ad hoc group tasked to investigate and implement measures to improve the availability of SIGMET information in the APAC Region, indicated that issues concerning the required dissemination of SIGMET from Papua New Guinea (which should be consistent with Regional guidance) need to be addressed. The meeting suggested that a program of SIGMET monitoring could help determine a solution to the problem.

5.4 Furthermore, investigations of the ad hoc group mentioned above showed that responsible meteorological watch offices in Papua New Guinea and Solomon Islands, which received tropical cyclone and volcanic ash advisory information from the appropriate TCACs and VAACs, did not appear to have appropriate procedures, policies and training in place to effectively utilize the information in accordance with ICAO provisions.

5.5 Based on the ad hoc group's findings, it was strongly recommended that SIGMET monitoring and targeted in-State SIGMET training or workshop be considered in order to assist Papua New Guinea and Solomon Islands with effective implementation of the relevant ICAO provisions. It was also recommended that Nauru designate a meteorological authority in accordance with ICAO provisions as a matter of urgency in order to progress with implementation of aeronautical meteorological service, including SIGMET, in the Nauru flight information region (FIR).

5.6 In view of the outcomes of the ad hoc group investigation, and with reference to previous activities conducted on a bilateral basis between States in the Region including TAF training provided by Australia in the Solomon Islands and a collaborative (Papua New Guinea /Australia) diagnostic study of meteorological service provision in Papua New Guinea, the meeting formulated the following Draft Conclusion and Decision:

Draft Conclusion 19/3 — SIGMET Training

That ICAO, in coordination with the WMO and relevant States and organizations, considers facilitating urgent, targeted training for aeronautical meteorological service providers designated by States in the APAC region to improve the quality, reliability and availability of SIGMET information, particularly in States with identified SIGMET deficiencies.

Notes: the following specific recommendations are provided:

1) Follow-up training programme on SIGMET provision for the Solomon Islands (similar to the TAF training programme conducted on a bilateral basis in 2014);

2) Follow-up on recommendations from previous investigations into SIGMET provision in Pacific Island States (e.g., the diagnostic of MET service provision in Papua New Guinea conducted on a bilateral basis in 2014);

3) Encourage APAC States, in particular Papua New Guinea and the Solomon Islands, to participate in the Japan/WMO SIGMET Seminar planned for 2016, in coordination with WMO RAII/RAV;

4) Coordinate with WMO on the inclusion of possible additional training on SIGMET issuance in the training workshop under the WMO Severe Weather Forecasting Demonstration Project (SWFDP) program.

Decision 19/4 — SIGMET Deficiencies in the APAC Region

That, the ad hoc group, comprising New Zealand (Rapporteur), Australia, China, Indonesia and Japan, continue to assist with rectification of SIGMET Deficiencies in the APAC Region, including coordination of the following activities:

a) Alignment of the systems/processes/procedures used in Papua New Guinea and Solomon Islands for SIGMET issuance with relevant Annex 3[*] provisions and regional guidance materials;

b) Monitor SIGMET issuance by Papua New Guinea and Solomon Islands over a defined period and during specific volcanic ash and tropical cyclone events to determine level of effective implementation of SIGMET service;

c) Consider the inclusion of Papua New Guinea and Solomon Islands in volcanic ash scenarios for the second ICAO APAC volcanic ash exercise;

d) Assist Nauru with respect to the designation of meteorological authority, including associated arrangements for the provision of SIGMET service and, if necessary, establishment of a bilateral agreement for SIGMET issuance; and

[*] Annex 3 to the Convention on International Civil Aviation — *Meteorological Service for International Air Navigation*

e) Investigate other opportunities (particularly establishment of bilateral agreements or other targeted assistance) to facilitate the rectification of SIGMET deficiencies within the APAC Region.

5.7 The meeting suggested the VOLCEX/SG should consider organizing volcanic ash exercises to demonstrate exchange of SIGMET and volcanic ash advisory information in the Port Moresby and Honiara FIRs as soon as practical. To this end, the meeting encouraged the relevant VAAC providers (Australia and New Zealand) to develop appropriate VA scenarios to support the VA exercises and requested ICAO to specifically encourage Papua New Guinea and Solomon Islands to participate in VOLCEX/SG/2.

IP/28 — WMO regional forum on meteorological services for aviation safety in Southeast Asia

5.8 The WMO representative noted the Regional Forum on meteorological services for aviation safety in Southeast Asia, held in Jakarta, Indonesia from 29–30 April 2015, in which the following issues were raised by aeronautical meteorological service users:

- Cross-FIR-boundary misalignment of SIGMET information;
- Potential benefits from international cooperation in the provision of shared weather radar data (e.g., radar mosaics covering multiple FIRs);
- User demand for quality, graphical meteorological information to support operations (including availability in the cockpit).

5.9 A similar forum is planned for the South Pacific Region, to be held in Fiji from 20-24 October 2015.

Agenda Item 6: Research, development and implementation issues in the MET field

Agenda Item 6.1: WAFS (including WAFS TF Report)

IP/10 — WAFS TF work plan

6.1.1 The WAFS TF Chairman noted that the terms of reference would be taken up by the new working groups in the proposed new structure of MET SG and would need to be updated following endorsement of the new structure by APANPIRG. The meeting noted the updated work plan of the WAFS TF as contained in Appendix A to IP/10 and noted that the tasks from the work plan would need to be migrated to either MET/S WG or MET/IE WG work plans following endorsement of the new working groups by APANPIRG.

IP/20 — WAFS survey

6.1.2 The meeting noted the results of a survey in the APAC Region, conducted from mid-October 2014 to early-January 2015, on the operational use of services and products from the WAFS Providers and the related WAFS training needs of APAC States.

6.1.3 A total of 19 States and Territories responded to the survey, which provided information on: the distribution of use of the two world area forecast centres (WAFCs), London and Washington, as the primary source of WAFS information; use of the Secure SADIS FTP service for access to WAFS data; and the use of WAFS gridded information in GRIB2[*] code form and BUFR[†] code form, and WAFS chart information in PNG[‡] form.

6.1.4 The results indicated that some States were using SADIS 2G alone without getting access to Secured SADIS FTP service and would need to migrate to the latter in time for the planned cessation of SADIS 2G service in 2016. The United States noted the results of the survey indicated some States were utilizing WAFS gridded forecasts (icing, turbulence and CB[§]). The results did not show how the gridded data was being utilized and the level of use was still relatively low.

IP/24 – WAFS service reference

6.1.5 The meeting noted the WAFS service reference document that was developed by the WAFS TF in October 2010 (and last updated after MET SG/18) for distribution to States/Territories in APAC Region.

6.1.6 The WAFS service reference document provides an overview of the WAFS/WAFCs, including the communication mechanisms and datasets, and summarizes the end-user equipment requirements.

6.1.7 Depending on the continued requirement to maintain this document, the WAFS Provider State (United Kingdom) noted it would continue provide updates to the information as necessary.

IP/25 — Regional progress in WAFS implementation

6.1.8 The Chair of the WAFS TF indicated that the majority of the actions had been completed and encouraged the newly proposed MET/S WG to review the work plan as appropriate.

WP/07 — Summary of recent and forthcoming developments to the WAFS

6.1.9 The meeting noted progress of the WAFS since the last meeting of the MET SG in August 2014, including:

- Implementation of WAFS re-issuance policy for WAFS GRIB2 and WAFS SIGWX[**] charts
    - It is recommended that users of WAFS data confirm with their software providers that their systems can process corrected WAFS data
- Guidance and Training for States on the use and visualization of new gridded WAFS forecasts
- Future provision of additional flight levels to WAFS upper air forecasts
- Inclusion of WAFS GRIB2 CAT[*] and CB verification data on the 'WAFC London Performance

[*] World Meteorological Organization (WMO) gridded binary (GRIB) Edition 2 (GRIB2)
[†] Binary universal form for the representation of meteorological data (BUFR)
[‡] Portable network graphics (PNG)
[§] Cumulonimbus clouds
[**] Global forecasts of significant weather phenomena

Indicators' website

  - It is recommended that this information be consulted regularly in order to obtain the most benefit from these forecast fields

- Inclusion of WAFS GRIB2 icing verification data on the WAFC Washington website.
  - It is recommended that this information be consulted regularly in order to obtain the most benefit from these forecast fields
- WAFS SIGWX BUFR Edition
  - Note this information and ensure that your systems remain compatible with the BUFR Edition 3 for decoding of SIGWX BUFR. Note also that the SIGWX forecasts in PNG form will continue to be issued until further notice
- WAFC backup tests
  - Note this information and regularly visit the WAFSOPSG-website[†] to obtain information pertaining to WAFC backup tests and procedures
- Access to Internet based services (Secure SADIS FTP/WIFS)
  - Users are encouraged to establish and regularly test backup accounts with the alternative provider to be used in the rare event that their normal service (Secure SADIS FTP or WIFS, as specified by Regional Air Navigation Plan) is unavailable
  - It is the user's responsibility to apply for and arrange backup accounts

6.1.10 It was noted that WAFSOPSG- and SADISOPSG-websites[‡] are very useful information resources; these are envisaged to be maintained by ICAO in the meantime while the METP establishes itself to take over the key functions of the former global operations groups.

6.1.11 Lao PDR enquired as to which Internet-based service it should use, which, in accordance with FASID Table MET 6, is either Secure SADIS FTP or WIFS. FASID Table MET 6 provides information on the primary Internet-based system for access to WAFS forecasts and OPMET data for States in the APAC region.

6.1.12 In response to an enquiry, the WAFS provider (United Kingdom) considered possible provision of information on the verification process for WAFS forecasts.

WP/15 — Summary of recent and forthcoming developments to the SADIS

6.1.13 The meeting noted progress of the SADIS since the last meeting of the MET SG in August 2014, including:

- Future requirements with respect to the SADIS satellite broadcast beyond 2015
- Implementation of WAFS re-issuance policy for WAFS GRIB2 and WAFS SIGWX forecasts

[*] Clear-air turbulence
[†] http://www.icao.int/safety/meteorology/wafsopsg/Pages/default.aspx
[‡] http://www.icao.int/safety/meteorology/sadisopsg/Pages/default.aspx

  - It is recommended that users of WAFS data confirm with their software providers that their systems can process corrected WAFS data

- Provision of one-minute updates to traditional alphanumeric OPMET data on Secure SADIS FTP
  - It is recommended that users of WAFS data confirm with their software providers that their systems can process the one minute update data
- Additional alphanumeric bulletins in the OPMET_LAST_5MINS and OPMET_LAST_MINUTE files
- Removal of redundant folders on Secure SADIS FTP
- Increase of Secure SADIS FTP Individual client connections limit
- SADIS Gateway mid-life upgrade
- Access to Internet based services (Secure SADIS FTP/WIFS)
  - Users are encouraged to establish and regularly test backup accounts with the alternative provider to be used in the rare event that their normal service (Secure SADIS FTP or WIFS, as specified by Regional Air Navigation Plan) is unavailable

WP/13 — Cessation of SADIS 2G (31 July 2016)

6.1.14 The SADIS provider (United Kingdom) stressed the importance of users to act accordingly to prepare for the forthcoming cessation of the SADIS 2G service. The accuracy of the list of users of SADIS (2G and Secure FTP) service is limited to data provided by States in surveys, but does indicate that at least three APAC States may need to act urgently to ensure access to WAFS forecasts after the SADIS 2G service is ceased.

6.1.15 The meeting noted that the SADIS Provider has undertaken, and will continue to undertake, all practicable measures to inform all SADIS 2G users of the approaching cessation of the SADIS 2G service, and to provide advice with regard to transition from SADIS 2G to Secure SADIS FTP.

6.1.16 SADIS user States and SADIS users should determine the nature of their service (SADIS 2G or Secure SADIS FTP) and ensure that they have migrated to Secure SADIS FTP at the earliest opportunity. The recommendation is that the transition is complete and that SADIS 2G is not being used operationally after 1 June 2016. This will prevent any last minute problems when the satellite signal is terminated on 31 July 2016. The meeting noted that users should also consider obtaining a WIFS account for use as a backup should Secure SADIS FTP not be accessible.

6.1.17 In light of the above, the meeting formulated the following draft Conclusion:

Draft Conclusion 19/5 — SADIS user States and SADIS users to prepare for cessation of SADIS 2G

That, ICAO be invited to urge SADIS user States and SADIS users confirm the nature of their SADIS service, and where necessary ensure that they are prepared for the cessation of SADIS 2G. For those users not yet using, or who have not yet arranged accounts for, Secure SADIS FTP, it is strongly recommended that they undertake actions to migrate to the Secure SADIS FTP service at the earliest opportunity.

Notes:

1) Although the SADIS 2G service will continue until 31 July 2016, it is recommended that user's transition is complete and that SADIS 2G is not being used operationally after 1 June 2016; and

2) Users are encouraged to establish and regularly test backup accounts with the alternative provider to be used in the rare event that their normal service (Secure SADIS FTP or WIFS, as specified by Regional Air Navigation Plan) is unavailable.

Agenda Item 6.2: Observations and reports

IP/11 — Japan's Himawari-8 meteorological satellite

6.2.1 The meeting noted that Japan's new geostationary meteorological satellite, Himawari-8, began operation on 7 July 2015, providing significantly advanced capability for meteorological observations with improved capability for detection of sulphur dioxide (SO_2) in the atmosphere, which is used to help volcanic ash cloud detection.

6.2.2 WMO noted that a designated expert team is working with the new satellite data to develop improved forecasts and observations. User issues such as cost/benefits for using the new data and associated systems would need to be considered by States. Japan noted that system information is provided via the Japan Meteorological Agency (JMA) website and data is provided to national meteorological and hydrological services (NMHSs) via various dedicated channels such as the "HimawariCast" and "HimawariCloud" services.

WP/08 — Provision of METAR/SPECI by the United States

6.2.3 The United States informed the meeting that in light of a National Transportation Safety Board (NTSB) recommendation, reports of routine/special observations at aerodromes issued as METAR/SPECI and distributed by the United States for international availability will include a "remarks" section, with an effective date yet to be established. The meeting noted that a "remarks" section is not compliant with the Annex 3 provisions for METAR and SPECI [Annex 3, Table A3-2]. Some States expressed concern that this could have possible impacts for users without proper guidance on how to use the "remarks" section. There was also concern that this may compromise established systems configured to recognize Annex 3-compliant OPMET information. Furthermore, the meeting highlighted that the current ICAO meteorological information exchange model (IWXXM) format does not support "remarks" information and it is not clear how the "remarks" section could be exchanged within an IWXXM-compliant format.

Agenda Item 6.3: Forecasts, advisories and warnings (including MET/H TF Report)

IP/12 — Fifth Meeting of the APAC Meteorological Hazards Task Force

6.3.1 The meeting noted outcomes from MET/H TF/5, which was held in Seoul, Republic of Korea, from 18 to 20 March 2015. A conjoint session with ROBEX WG/13 was held on 18 March 2015 to address issues common to both groups related to the implementation of SIGMET and advisory information.

6.3.2 The meeting noted the status of progress on actions from MET/H TF/5 (and the conjoint session with ROBEX WG/13) as provided in IP/12. A number of initiatives were reported in separate papers to the meeting

IP/17 and IP/29 — APAC Regional SIGMET tests

6.3.3 Results from the 2014 APAC SIGMET tests for WC-, WV- and WS- type SIGMET were presented to the meeting for information. Participation in the SIGMET tests had improved noticeably on previous years, with test SIGMET recorded for the Nauru, Honiara and Port Moresby FIRs for the first time; however some errors, such as formatting were repeatedly recorded in some areas.

6.3.4 With respect to the results, ROBEX WG action is in progress to improve SIGMET test reporting and analysis in order to assist States in understanding and identifying the causes of errors and determining and implementing appropriate, effective solutions.

6.3.5 Lao PDR reported a problem related to availability of SIGMET from Lao PDR and the meeting encouraged the opportunity to discuss technical issues with the ROBEX WG Chairman and RODB* members present in the meeting.

6.3.6 Japan and Thailand have been providing technical assistance to Lao PDR to improve the issuance of SIGMET. In addition, Japan is collaborating with Myanmar to provide similar assistance in time for the 2015 SIGMET tests in November.

6.3.7 A state letter will be sent to States regarding the results of the SIGMET tests with practical advice on how specific errors may be corrected.

IP/18 — Graphical SIGMET monitor

6.3.8 The meeting noted the new system implemented by New Zealand, which graphically displays SIGMETs issued for the New Zealand FIR (NZZC) and the Auckland Oceanic FIR (NZZO).

6.3.9 The meeting also noted that Australia, Japan and Hong Kong, China provide similar services (as above). The Secretariat noted that cross-FIR boundary alignment of SIGMET information was raised as an issue of concern by users in recent consultative forums and should be a key consideration for States when providing SIGMET information, particularly in view of the Seamless ATM Plan requirements.

IP/26 — Verification of SIGMET information for thunderstorms

6.3.10 In order to promote a culture of continual improvement among meteorological service providers and to encourage other States to develop forecast verification systems, Hong Kong, China demonstrated a method for verification of SIGMET information for thunderstorms that could be used by other States.

* Regional OPMET data bank (located at Bangkok, Brisbane, Nadi, Singapore and Tokyo)

IP/27 — Activities on SIGMET-related issues

6.3.11 The meeting noted ongoing initiatives by China on SIGMET-related issues, including organizing training, in conjunction with the WMO, to help improve the issuance of SIGMET information in the region, and ongoing cooperation with Cambodia on the provision of aeronautical meteorological services for the Phnom Penh (VDPP) FIR.

6.3.12 The Chair acknowledged the significant assistance provided by China to improve SIGMET issuance in the Southeast Asia region.

WP/11 — Darwin TCAC area of responsibility

6.3.13 Australia notified the group that the southern boundary of the Darwin TCAC area of responsibility had changed to better align with the Reunion- and Nadi- TCAC areas of responsibility. The new area of responsibility for Darwin TCAC is bounded by 0 — 40ºS / 90 — 160ºE. In view of the above, the meeting adopted the following decision:

Decision 19/6 — Darwin TCAC Boundary

That:

a) the ICAO Secretariat ensure that all relevant documents are updated with the new Darwin TCAC area of responsibility; and

b) States ensure all procedural documents are updated with the boundary information for Darwin TCAC.

WP/21 — Tropical cyclone information

6.3.14 The meeting reviewed follow-up to the conjoint ROBEX WG/13 — MET/H TF/5 Decision 7 – *Review guidance for tropical cyclone advisory and SIGMET information*, which tasked an ad-hoc group, comprising Australia (rapporteur), Hong Kong-China, Japan and India, in consultation with IATA and/or IFALPA, to develop proposal(s) for the improvement of guidance material supporting clarity and consistency of information within tropical cyclone advisory and SIGMET messages in the Region.

6.3.15 The meeting supported the proposals developed by the ad hoc group and noted that among other improvements to tropical cyclone advisory information, consideration should be given for:

i) A new element for “Time of Observation” in addition to the “Time of origin”;

ii) The element “Advisory number” to be greater than 99;

iii) A new element for “horizontal and vertical extent” of cumulonimbus cloud associated with a tropical cyclone; and

iv) A new element for “Changes in intensity” of the tropical cyclone.

6.3.16 In SIGMET information, “forecast position” of the phenomenon (tropical cyclone*) at a specified time other than the end of the validity period of the SIGMET message (*may be appropriate for volcanic ash, too) should be considered.

6.3.17 In view of the above, the meeting formulated the following Draft Conclusion:

Draft Conclusion 19/7 — Tropical Cyclone Advisory (TCA) and SIGMET messages

That, to facilitate clarity and consistency of information within tropical cyclone advisory and SIGMET messages, the ICAO considers updating the templates for advisory messages for tropical cyclones [Annex 3, Table A2-2] and SIGMET [and AIRMET] messages [Annex 3, Table A6-1A.]

6.3.18 Noting that there was still a need for guidance to assist with consistency of the information, the meeting also formulated the following Decision:

Decision 19/8 — Tropical Cyclone Advisory (TCA) messages

That, to facilitate clarity and consistency of information within tropical cyclone advisory and SIGMET messages in the Region, the APAC tropical cyclone advisory centre (TCAC) Provider States be encouraged to provide information in the "Remarks" (RMK) element of the advisory messages for tropical cyclones to support meteorological watch offices (MWOs) with the provision of tropical cyclone SIGMET information including "Changes in intensity" and the horizontal and vertical extent of "CB TOP", based on information provided by the TCACs. (MET SG) consideration should also be given to the provision of an appropriate example in the SIGMET Guide.

IP/15 — Graphical tropical cyclone advisory (TCAC Tokyo)

6.3.19 The meeting noted that TCAC Tokyo will start providing tropical cyclone advisory information in graphical form (TCG) in accordance with the provision in Annex 3 [Appendix 2, 5.1.3] on 26 August 2015.

WP09 — Contingency plans for tropical cyclone advisory information

6.3.20 Noting that there are no specific ICAO documented procedures or agreements for the backup of TCACs within APAC, whereas there are formal procedures and agreements for ICAO VAAC's and WMO Tropical Cyclone Warning Centres (TCWCs), Australia, as a TCAC provider considered, for example in the context of regional contingency plans, the existence of formal requirement for TCACs to have backup centre.

6.3.21 The meeting did not consider that TCACs should necessarily have backup arrangements with each other, but did agree that some kind of backup arrangement for TCACs would be considered necessarily as part of a properly organized quality system assuring the quality management of TCAC services. In this respect the meeting requested ICAO to clarify, if possible, the global requirements with respect to backup of TCACs and, therefore, adopted the following Decision:

Decision 19/9 — Back up of TCACs

That, ICAO clarifies the requirements, if any, for backup arrangements with respect to provisions related to TCACs.

IP/16 — Outcomes from the volcanic ash exercise VOLKAM15

6.3.22 The meeting noted an overview of challenges and outcomes form the volcanic ash exercise in Kamchatka in 2015 (VOLKAM15) conducted on 15-16 April 2015.

IP/13 — First meeting of the volcanic ash exercises steering group (APAC VOLCEX/SG/1)

6.3.23 The meeting noted the summary of APAC VOLCEX/SG/1, which was held in Manila, Philippines, from 27 to 29 May 2015.

6.3.24 Planning was conducted for the first ICAO volcanic ash exercise in the APAC Region, which will involve a volcanic ash exercise scenario based on an eruption of the Taal Volcano on the island of Luzon, Philippines, with volcanic ash cloud that spreads northwards and contaminates the Manila FIR.

6.3.25 Debrief Meeting and Future Planning Meeting will occur at the second meeting, APAC VOLCEX/SG/2, to be held in the ICAO Regional Office, Bangkok on 14 - 16 September 2015.

WP10, WP23 — Use of [WMO] headers during VAAC backup

6.3.26 In accordance with VAAC back up arrangements between New Zealand and Australia and Japan and Australia, in which the Wellington VAAC will provide a backup service across the Darwin VAAC area of responsibility, south of latitude 20S, and the Tokyo VAAC provides backup services north of latitude 20S, and in order to provide users clarity during backup operations, different WMO abbreviated headers will be used by Japan and New Zealand during backup operations. These are provided below:

Table 1: WMO abbreviated headers used by VAAC **Wellington** during backup of VAAC Darwin

Volcanic ash advisory information issued in abbreviated plain language	Volcanic ash advisory information issued in graphical format
FVAU04 ADRM	PFXD04 ADRM
FVAU05 ADRM	PFXD05 ADRM
FVAU06 ADRM	PFXD06 ADRM

Table 2: WMO abbreviated headers used by VAAC **Tokyo** during backup of VAAC Darwin

Volcanic ash advisory information issued in abbreviated plain language	Volcanic ash advisory information issued in graphical format
FVAU01 ADRM	TBA
FVAU02 ADRM	TBA
FVAU03 ADRM	TBA

6.3.27 In view of the discussion above, and the requirement to notify the relevant stakeholders of the arrangement, the meeting adopted the following Decision:

Decision 19/10 — WMO abbreviated headers used by VAAC Wellington/Tokyo during backup of VAAC Darwin

That, ICAO be invited to update Doc 9766 — *Handbook on the International Airways Volcano Watch (IAVW)*, Table 4-3, to include the new WMO abbreviated headers for volcanic ash advisory information bulletins (plain language and graphical format) issued by VAAC Wellington/Tokyo when backing up VAAC Darwin, after the coordination on

provision of backup volcanic ash advisory information in graphical format (VAG) is finalized between VAACs Darwin and Tokyo.

Note: The finalized backup procedure is expected to be reported to ROBEX WG/14.

6.3.28 The detailed, consolidated VAAC handover procedures that are expected to be delivered to ROBEX WG/14 will provide an opportunity to coordinate an update to Doc 9677 — *Handbook on the International Airways Volcano Watch (IAVW)* to include all VAAC backup arrangements in place between VAAC providers. This could be discussed with an appropriate global group.

IP/14 — Darwin VAAC management report

6.3.29 The meeting reviewed the VAAC Darwin management report, which addresses the main features of the IAVW operations, highlighting recent developments and difficulties and future planned developments.

6.3.30 The meeting requested ICAO to update relevant documents to reflect the new telephone number for VAAC Darwin:

Decision 19/11 — Change to Darwin VAAC telephone number

That, ICAO Secretariat ensure that all relevant documents are updated with the new Darwin VAAC telephone number and promulgate this information to States to ensure all procedural documents are updated accordingly.

6.3.31 Australia noted that State volcano observatories and MWOs should advise VAACs of any volcanic ash observations, particularly where the information is different to that contained in a valid volcanic ash advisory message. The meeting requested IFALPA to encourage its members to provide air-reports as necessary:

Decision 19/12 — Observations including air-reports of VA

ICAO to remind States and airspace users (through IFALPA) of the provisions [Annex 3/Doc 4444] relating to observing and reporting of hazardous phenomena, including volcanic ash information.

Agenda Item 6.4: OPMET exchange (including ROBEX WG Report)

WP/22 — Thirteenth meeting of the Regional OPMET Bulletin Exchange Working Group

6.4.1 The meeting reviewed a summary of ROBEX WG/13, which was held in Seoul, Republic of Korea, from 16 to 18 March 2015, and noted the agreed actions and work plan of the group.

6.4.2 With respect to relevant action being progressed through the ROBEX WG, the meeting noted that the FASID Table MET 2A should be the baseline source of information when monitoring the availability of OPMET information on the SADIS and WIFS.

6.4.3 ROBEX WG initiatives concerning a proposed capacity building workshop to facilitate planning and implementation of digital exchange of aeronautical meteorological information were further discussed in this Report at paragraphs 6.4.8 – 6.4.16.

6.4.4 Follow-up concerning other action items form ROBEX WG/13 is also covered in separate papers discussed in MET SG/19.

WP/14 – Status of OPMET availability from APAC

6.4.5 The meeting reviewed and appreciated the results of OPMET monitoring conducted and presented by IATA for the period of 9 weeks (ending at 20th of July, 2015). The meeting noted that the results showed some issues with respect the rate of availability of OPMET on the SADIS and WIFS, i.e., with respect to the aerodromes listed in FASID Table MET 2A — *OPMET information (METAR, SPECI and TAF) required in SADIS and WIFS*, which specifies the OPMET service to be provided at aerodromes listed in the aerodrome operational planning (AOP) Tables of the ANP and aerodromes not listed in the AOP Tables of the ANP.

6.4.6 Noting that, under the guidance of the ROBEX WG, ICAO, States and IATA have committed to utilize the monitoring data to provide States concerned with practical information on OPMET availability issues, the meeting formulated the following Draft Conclusion:

Draft Conclusion 19/13 — Improvement of OPMET data availability for aerodromes listed in AOP tables and aerodromes not listed in AOP tables

That, ICAO be invited to urge APAC States to continue efforts to improve the availability of OPMET data for aerodromes listed in FASID Table MET 2A, as soon as possible, including specifically to:

a) Achieve 95% availability on the SADIS/WIFS broadcast of OPMET data for the FASID Table MET 2A aerodromes listed in AOP Tables;

b) Achieve 90% availability on the SADIS/WIFS broadcast of OPMET data for the FASID Table MET 2A aerodromes not listed in AOP Tables; and

c) Support harmonized availability on the SADIS/WIFS broadcast of OPMET data for the FASID Table MET 2A aerodromes.

6.4.7 The meeting noted the IATA position that all OPMET data provided by States, i.e., for aerodromes listed in AOP Tables and for aerodromes not listed in AOP Tables, should be distributed and made available to airlines on the global distribution systems. Therefore, it was anticipated that IATA would request ICAO, through an appropriate global group, to facilitate an update of FASID Table MET 2A to reflect the availability of OPMET for aerodromes listed/not listed in AOP Tables.

WP/12 — Status and plans for IWXXM implementation within APAC

6.4.8 In view of Amendment 76 to Annex 3, which enabled the exchange of METAR, SPECI, TAF and SIGMET in digital form under a bilateral agreement between States in a position to do so, and, when approved, Amendment 77 to Annex 3, which will make the exchange of OPMET in digital form a recommendation and will also include volcanic ash advisory, tropical cyclone advisory and AIRMET information, and in view that such provisions for exchange of meteorological information in IWXXM format are envisaged to become an Annex 3 "Standard" with Amendment 78 (applicability as early as November 2018), the meeting noted the requirement for States to plan and implement XML-formatted OPMET (i.e., in accordance with IWXXM) and considered progress in the Region.

6.4.9 Furthermore, the meeting noted that the exchange of XML-formatted OPMET data requires data to be IWXXM compliant, which requires adequate preparatory period for implementation and the availability of the air traffic service (ATS) message handling system (AMHS) – noting that IWXXM-compliant OPMET cannot be transmitted using the aeronautical fixed telecommunication network (AFTN).

6.4.10 To monitor progress with the planning and implementation of both IWXXM-compliant OPMET and AMHS communications, the Chair of the ROBEX WG distributed the survey at **Attachment 8** to this Report to members of the meeting.

6.4.11 The meeting appreciated the importance of obtaining such information to facilitate effective implementation of digital exchange of meteorological information in the Region and noted that related cross-discipline matters should also be considered, such as the APAC Common Regional Virtual Private Network (CRV) project.

6.4.12 In view of the discussion above, the meeting formulated the following Draft Conclusion:

Draft Conclusion 19/14 — IWXXM and AMHS Survey

That, ICAO be invited to urge States to complete the survey located at **Attachment 8** to this Report prior to 30 October 2015 to provide information on the status of planning and implementation of IWXXM and AMHS in support of MET service for international air navigation.

6.4.13 To further build capacity in the Region, the meeting adopted the following Draft Conclusion formulated by ROBEX WG:

Draft Conclusion 19/15 — Capacity building workshop to facilitate planning and implementation of digital exchange of aeronautical meteorological information

That, ICAO, in coordination with the WMO, be invited to organize and conduct an inter-regional workshop in the first half of 2016 to build capacity in States for digital exchange of aeronautical meteorological information. The workshop should facilitate intra- and inter-regional planning and implementation activities.

6.4.14 The meeting discussed the need for a transition to operations document for digital exchange of meteorological information (in IWXXM format) in the Region. Australia advised that the EUR* Data Management Group had developed a *Concept of Operations for the Transition of OPMET Data Exchange using IWXXM*, which was being reviewed by the METP/WG MIE as a possible global guidance document, and noted that any Regional differences could be accommodated in an Appendix.

WP/24 — Status and plans for implementing IWXXM in Hong Kong, China

6.4.15 Hong Kong, China has conducted a test to successfully generate and validate IWXXM-formatted OPMET messages and has tested the transmission of an IWXXM message via AMHS (in collaboration with the FAA†). The test results highlighted the time required for the validation process and

* ICAO European Region
† Federal Aviation Administration (of the United States)

message transmission, which indicated that real-time tests would be necessary to further study performance of the (IWXXM) generation-validation-transmission-decoding processes. Hong Kong, China is working with Singapore and Thailand to develop and conduct such tests (via the extended AMHS service), which it anticipates will provide insight on issues concerning the Regional implementation of IWXXM and information useful to the WMO task team on aviation XML (TT-AvXML) in its development of IWXXM.

IP/23 — Status and plans for IWXXM in Australia

6.4.16 Australia noted it is unlikely to disseminate OPMET information in digital form in the near term; however, the AMHS connections (between RODBs Brisbane-Nadi and Brisbane-Singapore), which will be necessary to support digital exchange of meteorological information, will have been commissioned by February 2016 and a project is underway in Australia to support the exchange of OPMET (formatted in accordance with IWXXM) by November 2016. Australia noted that there would be implications for the ROBEX scheme if the designated RODBs are not able to support OPMET formatted in accordance with IWXXM.

Agenda Item 6.5: MET/ATM coordination (including MET/R TF Report)

IP/21 — MET/ATM Seminar 2015 and fourth meeting of the Meteorological Requirements Task Force

6.5.1 The meeting noted highlights from the Meteorology/Air Traffic Management (MET/ATM) Seminar 2015 and MET/R TF/4, which were held back-to-back at the Mita Kaigisho, Tokyo, Japan, from 29 June to 3 July 2015.

6.5.2 Key outcomes from the Seminar included the need for better coordination with air navigation service organizations (e.g., CANSO[*]) to enhance the formulation of air traffic management requirements for meteorological service.

6.5.3 Some States are already implementing ATM-tailored meteorological services (i.e., in addition to traditional Annex 3 ‘products’) to meet user requirements. Such information should be provided with consideration to the ‘general provisions’ in Annex 3 – even when the technical specifications have not been developed in Annex 3. In this respect, regional guidance material could be enhanced to assist States to develop meteorological services to meet the (current and future) requirements of ATM.

6.5.4 Coordination was important in order to keep abreast of developments with respect to future global provisions for tailored meteorological services to support ATM, which shall be managed principally by the METP.

[*] Civil Air Navigation Services Organization

6.5.5 The meeting noted that a proposed ICAO survey on ATM requirements for meteorological information, which would assist APAC Seamless ATM Planning, was still to commence under the work plan of the MET/R TF. An Air Traffic Flow Management (ATFM) survey conducted by the ATFM Steering Group (in 2014) to analyse the current ATFM status of the Region did not include any targeted analysis of meteorological information that States may have developed in support of ATFM operations. Therefore, a survey of current meteorological information supporting ATFM would provide important input to the development of regional guidance for the provision of such information. In order to further promote this initiative, the meeting adopted the following Draft Conclusion formulated by MET/R TF:

Draft Conclusion 19/16 — Survey of State Meteorological Information Supporting Air Traffic Management

That, States are urged to respond to the survey, located at **Attachment 9** to this Report, to gauge the types of meteorological information provided by meteorological services to support Air Traffic Management including Air Traffic Flow Management operations.

6.5.6 The meeting noted progress against other MET/R TF activities as detailed in the work plan document and task list attached to IP/21.

IP/22 — Meteorological services for the terminal area

6.5.7 Japan commenced operation of an Air Traffic Meteorology Center (ATMetC) at Fukuoka in 2006 to support ATM operations through the provision of weather briefings and ATM-tailored meteorological information. ATMetC services were augmented in 2014 with the establishment of the Tokyo Metropolitan Area Team (TMAT), as a branch of ATMetC, providing tailored meteorological information specifically to support tactical and flexible ATFM operations in the Haneda/Narita Airport terminal area.

Agenda Item 6.6: Climatological information

6.6.1 No papers were submitted for discussion under this item.

Agenda Item 6.7: Governance and training (incl. quality management, cost recovery, qualification and competencies of meteorological personnel)

SP/02 — QMS, competency and qualifications requirements

6.7.1 WMO provisions[*] for competency of aeronautical meteorological personnel became a standard on 1 December 2013. The meeting noted that Annex 3 currently does not explicitly specify competency standards with respect to aeronautical meteorological personnel, though QMS provisions for aeronautical meteorological service are relatively comprehensively stated.

6.7.2 New Zealand has assisted southwest Pacific island States with implementation of QMS for aeronautical meteorological service in recent years, but raised concerns over States' capacity to maintain compliance of QMS over time.

[*] Technical Regulations, Basic Documents No. 2, Volume I — *General Meteorological Standards and Recommended Practices*, 5.1 Competence of Aeronautical Meteorological Personnel

6.7.3 In order to facilitate States understanding and, in turn, planning and implementation of competency requirements for aeronautical meteorological personnel, the meeting considered a proposal to include a competency provision in Annex 3 and formulated the following Draft Conclusion:

Draft Conclusion 19/17 — Competency of aeronautical meteorological personnel

That, in order to align the provisions concerning the required competency of operational personnel, ICAO be invited to consider inclusion in Annex 3 of a new provision on the competency of aeronautical meteorological personnel, similar to paragraph 3.7.4 in Annex 15 on the competency of aeronautical information services (AIS) personnel, with appropriate reference to relevant WMO material on competency and qualification of aeronautical meteorological personnel.

Agenda Item 6.8: Other

6.8.1 No papers were submitted for discussion under this item.

Agenda Item 7: Regional guidance material

WP/05 — ROBEX handbook updates

7.1 The meeting provided a number of additional updates to the draft ROBEX handbook updates in WP/05, including availability of METAR from Indonesian aerodromes (Flimsy 04 refers) and composition of TAF bulletins compiled by ROBEX Centre Brisbane (Flimsy 05 refers), which are incorporated at **Attachment 10** to this Report for endorsement by APANPIRG/26.

WP/16 — APAC ICD updates

7.2 The meeting provided a number of additional updates to the draft OPMET data banks interface control document (ICD) in WP/16, which are incorporated at **Attachment 11** to this Report for endorsement by APANPIRG/26.

WP17 — Review SIGMET Guide

7.3 With reference to the Regional adoption of the SIGMET Guide template (developed by the global METWSG[*]), IATA appreciated the various ICAO Regions' efforts in implementing a system of harmonized SIGMET guidance material that would support improved issuance and better standardization of SIGMET information, which is important to users for several applications.

7.4 The meeting provided a number of additional updates to the draft new APAC Regional SIGMET Guide (based on the SIGMET Guide template), which are incorporated in the **Attachment 12** to this Report for endorsement by APANPIRG/26.

WP/19 — SIGMET Pamphlets

7.5 A number of additional modifications were suggested during the meeting to improve the SIGMET pamphlets presented by the ad hoc group comprising Australia, New Zealand and Hong Kong, China in WP/19. In order to finalize the development of the SIGMET pamphlets so that they can be

[*] Meteorological warnings study group

utilized as Regional guidance material, the meeting formulated the following Draft Conclusion for consideration by APANPIRG and the following Decision for action by the MET SG:

Draft Conclusion 19/18 — SIGMET Pamphlets

That, the final version of the SIGMET Pamphlets located at **Attachment 13** to this Report be adopted as Regional guidance material and distributed to States to facilitate improved format of SIGMET information.

Decision 19/19 — SIGMET Pamphlets

That, the ad hoc group, consisting of Australia, New Zealand, Japan and Hong Kong China:

a) Forward the final versions of the WS and WC SIGMET pamphlets to ICAO for publication on the APAC eDocuments website[*], if approved by APANPIRG;

b) Further develop the WV SIGMET pamphlet; and

c) Review the pamphlets again in July 2016 when Amendment 77 to Annex 3 is published to ensure that the pamphlets are aligned accordingly with Amendment 77 prior to its effective date in November 2016.

WP/18 — APAC regional guidance on the issuance of SIGMET for radioactive cloud

7.6 In order to ensure that the findings of the ad hoc group designated by MET/H TF/4 (comprising China (Rapporteur), Hong Kong-China and Japan) to develop Regional guidance on the issuance of SIGMET for radioactive cloud are considered by the appropriate (global) group tasked with formulating global guidance and provisions for SIGMET on radioactive cloud, and to ensure that efforts continue on the development of some level of guidance for MWOs in the APAC Region, the meeting adopted the following Decision:

Decision 19/20 — Regional guidance on SIGMET (radioactive cloud)

That,

a) MET SG members who are members of the METP, be invited to forward the draft guideline on the issuance of SIGMET for radioactive cloud to the METP at the earliest opportunity for further consideration; and

b) The ad hoc group be invited to continue work on Regional guidance material based on the work done so far.

WP/20 — APAC Regional guidance on aerodrome tsunami warnings

7.7 The draft Regional guidance material for aerodrome tsunami warnings prepared by the ad-hoc group (comprising Japan and Indonesia) designated by the MET/H TF was presented to the

[*] http://www.icao.int/APAC/Pages/edocs.aspx

meeting. The meeting agreed that additional input should be sought to further develop the guidance. Australia offered to provide additional information with respect to its tsunami warning service for the aviation community.

Agenda Item 8: Future work programme

Future work programme

8.1 The meeting reviewed and updated the future work program of the MET SG as provided in the subject/tasks list in the MET field at **Attachment 14** to this Report.

Next meeting

8.2 With consideration of the APANPIRG/25 future work programme, which tentatively scheduled MET SG/20 in May 2016, the meeting agreed that MET SG/20 should be tentatively scheduled for 9-12 May 2016.

Agenda Item 9: Any other business

9.1 No papers were submitted for discussion under this item.

—END—

NINETEENTH MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/19) OF APANPIRG

Bangkok, Thailand 3 – 6 August 2015

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Attachment 2 to the Report

International Civil Aviation Organization

NINETEENTH MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/19) OF APANPIRG

Bangkok, Thailand, 3 – 6 August 2015

LIST OF WORKING/INFORMATION PAPERS

WP/IP/ SP No.	Agenda	Subject	Presented by
		WORKING PAPERS	
WP/1	2	Provisional Agenda	Secretariat
WP/2	2	Meteorology Sub-group Structure	Chair of the METSG
WP/3	5	Review APAC MET Deficiencies	Secretariat
WP/4	4	ASIA/PAC Air Navigation Plan	Secretariat
WP/5	7	ROBEX Handbook Updates	Secretariat
WP/6	5	Improvement of SIGMET Availability in the APAC Region	the Rapporteur, MET/H TF, Ad Hoc Group, SIGMET Deficiencies
WP/7	6.1	Summary of Recent and Forthcoming Developments to the WAFS	WAFC Provider States
WP/8	6.2	Provision of the Full U.S. METAR/SPECI Reports on SADIS Dissemination Systems	WIFS Provider States
WP/9	6.3	Contingency Plans for Tropical Cyclone Advisories	Australia
WP/10	6.3	Use of Headers during Backup of Darwin VAAC by Wellington VAAC	New Zealand
WP/11	6.3	Darwin TCAC Boundary Change	Australia
WP/12	6.4	Status and Plans for IWXXM Implementation within APAC	Australia
WP/13	6.4	Cessation of SADIS 2G – 31 July 2016	SADIS Provider
WP/14	6.4	Status of METAR/TAF Availability from ASIA/PAC	IATA
WP/15	6.4	Summary of Recent and Forthcoming Developments to the SADIS	SADIS Provider
WP/16	7	ASIA/PAC ICD Updates	Secretariat

WP/IP/ SP No.	Agenda	Subject	Presented by
WP/17	7	Review SIGMET Guide	Secretariat
WP/18	7	The Asia/Pacific Regional Guidance on the Issuance of SIGMET for Radioactive Cloud	China
WP/19	7	SIGMET Pamphlets	MET/H TF Ad Hoc Group
WP/20	7	The Asia/Pacific Regional Guidance on Aerodrome Tsunami Warnings	the Rapporteur, MET/H TF, ad-hoc group
WP/21	6.3	Tropical Cyclone Advisories	MET/H TF Ad Hoc Group
WP/22	6.4	ROBEX Working Group Report	Chair of ROBEX WG
WP/23	6.3	Use of Headers during Backup of VAAC Darwin by VAAC Tokyo	Japan
WP/24	6.4	Status and Plan for Implementing IWXXM in Hong Kong, China	Hong Kong, China
LIST OF INFORMATION PAPERS			
IP/1	2	Terms of Reference of the Meteorology Sub-group	Secretariat
IP/2	2	Project Management Principles	Secretariat
IP/3	3	Review of MET SG/18	Secretariat
IP/4	3	Review of APANPIRG/25	Secretariat
IP/5	3	REVIEW OF METP/1	Secretariat
IP/6	4	Air Navigation Reporting Form (ANRF)	Secretariat
IP/7	4	Regional Priorities and Targets	Secretariat
IP/8	4	APAC Seamless ATM Plan	Secretariat
IP/9	4	Updates to OPMET Related FASID Tables	Secretariat
IP/10	6.1	Update of Work Plan of WAFS TF	Chairman, WAFS Task Force
IP/11	6.2	HIMAWARI-8 began Operation	Japan
IP/12	6.3	Report on MET/H TF/5	Secretariat on behalf of the Chairman of the MET/H TF
IP/13	6.3	Report on APAC VOLCEX/SG/1	Chair of APAC VOLCEX/SG

WP/IP/ SP No.	Agenda	Subject	Presented by
IP/14	6.3	Darwin VAAC Management Report	Australia
IP/15	6.3	Graphical Tropical Cyclone Advisory – TCAC Tokyo	Japan
IP/16	6.3	Outcomes of Volcanic Ash Exercise in Kamchatka in 2015 (VOLKAM15)	Japan
IP/17	6.3	Progress with SIGMET Tests – WC and WV	Japan
IP/18	6.3	Graphical SIGMET Monitor	New Zealand
IP/19	3	Report of the Second Meeting of the APANPIRG Contributory Bodies Structure Review Task Force (ABSRTF/2)	Secretariat
IP/20	6.1	Survey on Operational Use of Services and Products from Service Providers of WAFS in Asia/Pacific Region and WAFS Training Needs of Asia/Pacific States	Chairman, WAFS Task Force
IP/21	6.5	Report on MET/R TF/4 and MET/ATM Seminar 2015	Secretariat on behalf of the Chairman of the MET/R TF
IP/22	6.5	Meteorological Services for the Terminal Area	Japan
IP/23	6.4	Status and plans for IWXXM in Australia	Australia
IP/24	6.1	Update of WAFS Service Reference Document	Chairman, WAFS Task Force
IP/25	6.1	Regional Progress in WAFS Implementation	Chairman, WAFS Task Force
IP/26	6.3	Verification of TS SIGMET with Satellite Pictures	Hong Kong, China
IP/27	6	Activities on SIGMET – Related Issues	China
IP/28	5	WMO Regional Forum on MET for Aviation Safety in SE-ASIA	Secretariat
IP/29	6.3	Review SIGMET Test Results	Secretariat
LIST OF PRESENTATIONS			
SP/01	6.3	Verification of Thunderstorm (TS) SIGMET with Satellite Pictures (IP/26 referred)	Hong Kong, China
SP/02	6.7	QMS, Competency and Qualifications requirements - Update on implementation	WMO

WP/IP/ SP No.	Agenda	Subject	Presented by
		LIST OF FLIMSIES	
1	3	MET SG – WGs TOR	Ad hoc group
2	5	Improvement of SIGMET	Ad hoc group
3	6.3	Tropical Cyclone Advisories	Australia and Secretariat
4	7	ROBEX Handbook Updates	Indonesia
5	7	ROBEX Handbook Updates	Australia
6	7	APAC ICD Updates	Australia
7	4	FASID Table MET 1A	Australia

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TERMS OF REFERENCE OF THE METEOROLOGICAL REQUIREMENTS WORKING GROUP (MET/R WG)

Under guidance from ICAO APAC MET Secretariat:

a) Identify and evaluate the current and future requirements for MET in support of ATM (includes ATFM), as well as ATM in support of MET;

b) Develop and provide guidance and reference material to assist States to meet MET requirements;

c) Assess aeronautical meteorological services, systems and architecture and how they can integrate weather information into ATM, airspace user systems and decision support tools;

d) Promote coordination between MET and ATM communities to enhance the level of understanding of MET requirements and capabilities in support of ATM;

e) Study the successful involvement of MET in the development of CDM/ATFM in other regions with a view to future application;

f) Monitor regional implementation of global policies, including those associated with source data and delivery of MET information for ATM;

g) Provide support to other appropriate bodies under the MET Sub-group and ATM Sub-group on the development of ATM contingency plan for specific phenomenon including volcanic ash, radioactive cloud, tropical cyclone and tsunami;

h) Provide expertise on MET services and information to assist appropriate bodies under the ATM Sub-group in the establishment of sub-regional ATFM and to identify MET service requirements;

i) Enhance regional implementation of MET services in line with the priorities defined in the ASIA/PAC Seamless ATM Plan, closely referring to the Global Air Navigation Plan (GANP) and the Aviation System Block Upgrades (ASBUs);

j) Monitor the relevant activities of the MET Panel and appropriate bodies; and

k) Provide advice and report to the MET Sub-group on the above issues for further co-ordination through the ICAO Secretariat with other appropriate bodies.

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TERMS OF REFERENCE FOR THE METEOROLOGICAL SERVICES WORKING GROUP (MET/S WG)

Under guidance from ICAO APAC MET Secretariat:

a) Identify and evaluate current and future requirements with respect to meteorological services, in particular, observations, forecasts, advisories and warnings, in support of the aviation system block upgrades (ASBUs);

b) Promote the implementation of meteorological services;

c) Promote the requirement for, and benefits of, QMS for MET services and competency of aeronautical meteorological personnel;

d) Maintain awareness of, and identify new, meteorological deficiencies and formulate strategies to resolve these deficiencies;

e) 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);

f) Monitor the relevant activities of the MET Panel and appropriate bodies; and

g) Provide advice and report to the MET Sub-group on the above issues for further co-ordination through the ICAO Secretariat with other appropriate bodies.

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TERMS OF REFERENCE FOR THE METEOROLOGICAL INFORMATION EXCHANGE WORKING GROUP (MET/IE WG)

Under guidance from the ICAO APAC MET Secretariat:

a) Review the OPMET exchange schemes in the APAC and other regions and develop proposals for their optimization, taking into account the requirements by the aviation users and global OPMET exchange;

b) Monitor and participate in trials of digital aeronautical meteorological information exchange inter- and intra- regionally;

c) Develop standardized quality control, monitoring and management procedures related to exchange of IWXXM and TAC OPMET information;

d) Review the regional guidance material related to OPMET exchange;

e) Liaise with other appropriate bodies within ICAO and WMO dealing with communication and/or management aspects of the OPMET exchange; and

f) Provide advice and report to the MET Sub-group on the above issues for further co-ordination through the ICAO Secretariat with other appropriate bodies.

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APANPIRG/26 - **WP/10 (ATTACHMENT)**
Agenda Item 3.5

APPENDIX B – DRAFT NEW eANP — MET

ASIA/PAC ANP, VOLUME I

PART V – METEOROLOGY (MET)

1. INTRODUCTION

1.1 This part of the **ASIA/PAC** ANP constitutes the agreed regional requirements considered to be the minimum necessary for effective planning and implementation of aeronautical meteorology (MET) facilities and services in the **ASIA/PAC** Region(s) and complements the provisions of ICAO SARPs and PANS related to MET. It contains stable plan elements related to the assignment of responsibilities to States for the provision of MET facilities and services within the ICAO **ASIA/PAC** region(s) in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300) and mandatory requirements related to the MET facilities and services to be implemented by States in accordance with regional air navigation agreements.

1.2 The dynamic plan element related to the assignment of responsibilities to States for the provision of MET facilities and services and the mandatory requirements based on regional air navigation agreements related to MET are contained in the **ASIA/PAC** ANP Volume II, Part V - MET.

1.3 The **ASIA/PAC** ANP Volume III contains dynamic/flexible plan elements related to the implementation of air navigation systems and their modernization in line with the ICAO Aviation System Block Upgrades (ASBUs) methodology and associated technology roadmaps described in the Global Air Navigation Plan. The Aviation System Block Upgrades (ASBUs) modules are aimed at increasing capacity and improving efficiency of the aviation system whilst maintaining or enhancing safety level, and achieving the necessary harmonization and interoperability at regional and global level. This includes the regionally agreed ASBU modules applicable to the specified ICAO region/sub-region and associated elements/enablers necessary for the monitoring of the status of implementation of these ASBU modules.

Standards, Recommended Practices and Procedures

1.4 The Standards, Recommended Practices and Procedures (SARPs) and related guidance material applicable to the provision of MET are contained in:

- Annex 3 - *Meteorological Service for International Air Navigation*; and
- *Regional Supplementary Procedures (Doc 7030);*
- *Handbook on the IAVW (Doc 9766);*
- *Manual on Volcanic Ash, Radioactive Material and Toxic Chemical Clouds (Doc 9691); and*
- *Manual of Aeronautical Meteorological Practice (Doc 8896).*

2. GENERAL REGIONAL REQUIREMENTS

World area forecast system (WAFS) and meteorological offices

2.1 In the **ASIA/PAC** Region(s), WAFC **London and Washington** have been designated as the centres for the operation of the aeronautical fixed service satellite distribution system ~~/ WAFS Internet File Service (SADIS and WIFS) and~~, the Internet-based Secure SADIS FTP service and the WAFS Internet File Service (SADIS 2G[1], Secure SADIS FTP and WIFS, respectively). The status of implementation of SADIS and WIFS by States in the **ASIA/PAC** Region(s) is detailed in Volume III.

2.2 In the **ASIA/PAC** Region(s), WAFS products in digital form should be disseminated by WAFC **London** ~~**and Washington**~~ using the SADIS 2G[1] satellite broadcast and the Secure SADIS FTP service and ~~/or~~ and by WAFC **Washington** using WIFS.

Volcanic Ash

[1] The SADIS 2G Service will be withdrawn by the centre designated for the operation of the aeronautical fixed service satellite distribution system on 31 July 2016

2.3 Volcanic ash advisory centres (VAACs) **Anchorage, Darwin, Tokyo, Toulouse, Washington** and **Wellington** have been designated to prepare volcanic ash advisory information for the **ASIA/PAC** Region(s)~~, as indicated below~~. The status of implementation of volcanic ash advisory information is detailed in Volume III.

2.4 Selected State volcano observatories have been designated for notification of significant pre-eruption volcanic activity, a volcanic eruption and/or volcanic ash in the atmosphere for the **ASIA/PAC** Region(s) to their corresponding ACC/FIC, MWO and VAAC, as indicated at **Table MET I-1**. The status of implementation of volcano observatory notice for aviation (VONA) is detailed in Volume III.

Tropical Cyclone

2.5 Tropical cyclone advisory centres (TCACs) **Darwin, Honolulu, Nadi, New Delhi, Reunion** and **Tokyo** have been designated to prepare tropical cyclone advisory information for the **ASIA/PAC** Region(s)~~, as indicated below~~. The status of implementation of tropical cyclone advisory information is detailed in Volume III.

3. SPECIFIC REGIONAL REQUIREMENTS

3.1 ***TBD (if necessary)***

TABLE MET I-1 - STATE VOLCANO OBSERVATORIES

Explanation of the Table

Column

1 Name of the State responsible for the provision of a volcano observatory

2 Name of the volcano observatory

TABLE MET I-1 - STATE VOLCANO OBSERVATORIES

State	Volcano observatory
1	**2**
China	Heilongjiang Wudalianchi Volcano Observatory
China	Jilin Changbai Mountain Tianchi Volcano Observatory
Japan	Fukuoka Volcano Observations and Information Center, Japan Meteorological Agency
Japan	Kagoshima Local Meteorological observatory, Japan Meteorological Agency
Japan	Sapporo Volcano Observations and Information Center, Japan Meteorological Agency
Japan	Sendai Volcano Observations and Information Center, Japan Meteorological Agency
Japan	Tokyo Volcano Observations and Information Center, Japan Meteorological Agency
India	TBD
Indonesia	Directorate of Volcanology and Geological Hazard Mitigation (DVGHM)
New Zealand	Wairakei Research Centre Institute of Geological and Nuclear Sciences
Papua New Guinea	Rabaul
Philippines	Philippine Institute of Volcanology and Seismology (PHIVOLCS) Central Office

ASIA/PAC ANP, VOLUME II

PART V – METEOROLOGY (MET)

1. INTRODUCTION

1.1 This part of the **ASIA/PAC** ANP, Volume II, complements the provisions in the ICAO SARPs and PANS related to aeronautical meteorology (MET). It contains dynamic plan elements related to the assignment of responsibilities to States for the provision of MET facilities and services within a specified area in accordance with Article 28 of the *Convention on International Civil Aviation* (Doc 7300); and mandatory requirements related to the MET facilities and services to be implemented by States in accordance with regional air navigation agreements. Such agreement indicates a commitment on the part of the States concerned to implement the requirements specified.

2. GENERAL REGIONAL REQUIREMENTS

Meteorological offices

2.1 In the **ASIA/PAC** Region(s), meteorological watch offices (MWO) have been designated to maintain continuous watch on meteorological conditions affecting flight operations within their area(s) of responsibility, as indicated at **Table MET II-1**.

Meteorological observations and reports

2.2 In the **ASIA/PAC** Region(s), routine observations, issued as a METAR, should be made throughout the 24 hours of each day at intervals of one hour or, for RS and AS designated aerodromes[2] if so determined by regional air navigation agreement, at intervals of one half-hour at aerodromes as indicated in **Table MET II-2**. For aerodromes included on the VHF VOLMET broadcast as indicated in **Table MET II-3**, routine observations, issued as METAR, should be made throughout the 24 hours of each day.

2.3 At aerodromes that are not operational throughout 24 hours, METAR should be issued at least 3 hours prior to the aerodrome resuming operations in the **ASIA/PAC** Region(s).

Forecasts

2.4 In the **ASIA/PAC** Region(s), an aerodrome forecast, issued as a TAF, should be for the aerodromes indicated in **Table MET II-2**.

2.5 In the **ASIA/PAC** Region(s), the period of validity of a routine TAF should be of ~~9-~~12- , 18- , 24-, or 30-hours to meet the requirements indicated in **Table MET II-2**.

2.6 In the **ASIA/PAC** Region(s), the forecast maximum and minimum temperatures expected to occur during the period of validity, together with their corresponding day and time of occurrence, should be included in TAF at aerodromes indicated in **Table MET II-2**.

2.7 In the **ASIA/PAC** Region(s), landing forecasts (prepared in the form of a trend forecast) should be provided at aerodromes indicated in **Table MET II-2**.

Requirements for and use of communications

2.8 Operational meteorological information prepared as METAR, SPECI and TAF for aerodromes indicated in **Table MET II-2**, and SIGMET and AIRMET ~~***[if applicable]***~~ messages prepared for flight information regions or control areas indicated in **Table MET II-1**, should be disseminated to the international OPMET databanks designated for the **ASIA/PAC** Region(s) (namely Bangkok, Brisbane, Nadi, Singapore and Tokyo) and to the centres designated for the operation of the aeronautical fixed service satellite distribution system (SADIS 2G[3]) and the Internet-based service (Secure SADIS FTP) and~~/or~~ WIFS in the **ASIA/PAC** Region(s).

2.9 SIGMET messages should be disseminated to other meteorological offices in the **ASIA/PAC** Region(s) ***in accordance with the regional OPMET bulletin exchange scheme.*** ~~***[if applicable]***~~

2.10 Special air-reports that do not warrant the issuance of a SIGMET should be disseminated to other meteorological offices in the **ASIA/PAC** Region(s) ***in accordance with the regional OPMET bulletin exchange scheme.*** ~~***[if applicable]***~~

2.11 In the **ASIA/PAC** Region(s), meteorological information for use by aircraft in flight should be supplied through VOLMET broadcasts.

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[2] Refer to Table AOP II-1, Explanation of the table

[3] The SADIS 2G Service will be withdrawn by the centre designated for the operation of the aeronautical fixed service satellite distribution system on 31 July 2016

2.12 In the **ASIA/PAC** Region(s), the aerodromes for which METAR and SPECI are to be included in VOLMET broadcasts, the sequence in which they are to be transmitted and the broadcast time, is indicated in **Table MET II-3**.

3. SPECIFIC REGIONAL REQUIREMENTS

~~EXAMPLES~~

~~Meteorological observations and reports~~

~~3.1 For the EUR Region, routine observations, issued as METAR, should be made throughout the 24 hours of each day at intervals of one half hour.~~

~~3.2 In the **(NAME)** Region, aeronautical meteorological stations have been established on offshore structures or at other points of significance in support of helicopter operations to offshore structures, as indicated at Table MET II-MID-X (Former MET 1C Offshore structures). [if applicable]~~

~~3.3 In the **(NAME)** Region, information on the sea-surface temperature and the state of the sea or the significant wave height from aeronautical meteorological stations established on offshore structures in support of helicopter operations should be included as supplementary information in METAR and SPECI as indicated in Table MET II-MID-X (MET 1C Offshore structures). [if applicable]~~

~~3.4 In the **(NAME)** Region, information on the state of the runway should be included as supplementary information in METAR and SPECI as indicated in Table MET II-2 (Former MET 1A Aerodrome meteorological offices). [if applicable]~~

~~3.5 In the **(NAME)** Region, GAMET area forecasts and/or area forecasts for low-level flights in chart form prepared in support of the issuance of AIRMET information, and AIRMET information for low-level flights relevant to the whole route, should be supplied to operators and flight crew members and kept up to date. Section II of the GAMET area forecast should include information, in addition to the provisions in Annex 3, as contained at Appendix MET LLF to Part V (MET). [if applicable]~~

~~AIRMET information~~

~~3.6 In the **(NAME)** Region, AIRMET information should be issued by a MWO for its areas of responsibility as indicated in Table MET II-1 (Former MET 1B Meteorological watch offices). [if applicable]~~

~~OPMET information~~

~~3.7 In the EUR Region, The details of the exchange scheme to be used the OPMET information is given in the EUR Region – EUR OPMET Data Management Handbook (EUR Doc 018). [if applicable]~~

Service for operators and flight crew members

~~3.8 In the **(NAME)** Region, meteorological information for pre-flight planning by operators of helicopters flying to offshore structures as indicated in Table MET II-MID-X (Former MET 1C Offshore structures) should include data covering the layers from sea level to FL 100. Particular mention should be made of [the expected surface visibility, the amount, type (where available), base and tops of cloud below FL 100, the sea state and sea-surface temperature, the mean sea-level pressure and the occurrence or expected occurrence of turbulence and icing]. [if applicable]~~

3.9 In the APAC Region, scheduled VOLMET broadcasts should contain TAF and SIGMET.

3.10 In the APAC Region, METAR, SPECI and TAF should be available for uplink to aircraft in flight via D-VOLMET.

TABLE MET II-1 - METEOROLOGICAL WATCH OFFICES

Explanation of the Table

Column

1 Name of the State where meteorological service is required

2 Name of the flight information region (FIR) or control area (CTA) where meteorological service is required
Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

3 ICAO location indicator of the FIR or CTA

4 Name of the meteorological watch office (MWO) responsible for the provision of meteorological service for the FIR or CTA
Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

5 ICAO location indicator of the responsible MWO

6 Requirement for SIGMET information (excluding for volcanic ash and for tropical cyclones) to be provided by the MWO for the FIR or CTA concerned, where:
Y – Yes, required
N – No, not required

7 Requirement for SIGMET information for volcanic ash to be provided by the MWO for the FIR or CTA concerned, where:
Y – Yes, required
N – No, not required

8 Requirement for SIGMET information for tropical cyclone to be provided by the MWO for the FIR or CTA concerned, where:
Y – Yes, required
N – No, not required

9 Requirement for AIRMET information to be provided by the MWO for the FIR or CTA concerned, where
Y – Yes, required
N – No, not required

TABLE MET II-1 - METEOROLOGICAL WATCH OFFICES

State	FIR or CTA Where Meteorological Service is Required		Responsible Meteorological Watch Office		Meteorological Service To Be Provided			
	Name	ICAO Location Indicator	Name	ICAO Location Indicator	SIGMET (WS)	SIGMET (WV)	SIGMET (WC)	AIRMET (WA)
1	2	3	4	5	6	7	8	9
AFGHANISTAN	KABUL FIR / SSR	OAKX	KABUL AD	OAKB	Y	Y	N	N
AUSTRALIA	MELBOURNE FIR[1]	YMMM	ADELAIDE (REGIONAL FORECASTING CENTRE)	YPRM	Y	N	N	N
	BRISBANE FIR[2]	YBBB	BRISBANE (REGIONAL FORECASTING CENTRE)	YBRF	Y	N	Y	N
	BRISBANE FIR[4] MELBOURNE FIR[5]	YBBB YMMM	DARWIN (REGIONAL FORECASTING CENTRE)	YPDM	Y	Y	Y	N
	MELBOURNE FIR[6]	YMMM	HOBART (REGIONAL FORECASTING CENTRE)	YMHF	Y	N	N	N

State	FIR or CTA Where Meteorological Service is Required		Responsible Meteorological Watch Office		Meteorological Service To Be Provided			
	Name	ICAO Location Indicator	Name	ICAO Location Indicator	SIGMET (WS)	SIGMET (WV)	SIGMET (WC)	AIRMET (WA)
1	2	3	4	5	6	7	8	9
	BRISBANE FIR MELBOURNE FIR	YBBB YMMM	MELBOURNE (WORLD MET CENTRE, BUREAU OF METEOROLOGY)	YMMC	Y	N	N	N
	BRISBANE FIR[7] MELBOURNE FIR[8]	YBBB YMMM	MELBOURNE (REGIONAL FORECASTING CENTRE)	YMRF	Y	N	N	N
	BRISBANE FIR[9] MELBOURNE FIR[10]	YBBB YMMM	PERTH (REGIONAL FORECASTING CENTRE)	YPRF	Y	Y	N	N
	BRISBANE FIR[11] MELBOURNE FIR[12]	YBBB YMMM	SYDNEY (REGIONAL FORECASTING CENTRE)	YSRF	Y	N	N	N
BANGLADESH	DHAKA FIR / SRR	VGFR	HAZRAT SHAHJALAL INTERRNATIONAL AIRPORT	VGHS	Y	Y	Y	N
CAMBODIA	PHNOM PENH FIR / SRR	VDPP	PHNOM PENH[14]	VDPP	Y	Y	Y	N
CHINA	BEIJING FIR / SRR	ZBPE	BEIJING/CAPITAL	ZBAA	Y	Y	Y	N
	GUANGZHOU FIR / SRR	ZGZU	GUANGZHOU/BAIYUN	ZGGG	Y	Y	Y	N
	KUNMING FIR / SRR	ZPKM	CHENGDU/SHUANGLIU	ZUUU	Y	Y	Y	N
	LANZHOU FIR / SRR	ZLHW	XI'AN/XIANYANG	ZLXY	Y	Y	N	N
	SANYA FIR / SRR	ZJSA	HAIKOU/MEILAN	ZJHK	Y	Y	Y	N
	SHANGHAI FIR / SRR	ZSHA	SHANGHAI/HONGQIAO	ZSSS	Y	Y	Y	N
	SHENYANG FIR / SRR	ZYSH	SHENYANG/TAOXIAN	ZYTX	Y	Y	N	N
	TAIBEI FIR / SRR	RCAA*	TAIBEI CITY/TAIBEI INTL AP	RCTP	Y	Y	Y	N
	URUMQI FIR / SRR	ZWUQ	URUMQI/DIWOPU	ZWWW	Y	Y	N	N
	WUHAN FIR / SRR	ZHWH	WUHAN/TIANHE	ZHHH	Y	Y	N	N
	HONG KONG FIR / SRR	VHHK	HONG KONG/INTL	VHHH	Y	Y	Y	N
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	PYONGYANG FIR / SRR	ZKKP	SUNAN	ZKPY	Y	Y	Y	N
FIJI	NADI FIR / SRR	NFFF	NADI/INTL	NFFN	Y	Y	N	N
FRENCH POLYNESIA	TAHITI FIR / SRR	NTTT*	TAHITI/FAAA	NTAA	Y	Y	Y	N
INDIA	CHENNAI FIR / SRR	VOMF	CHENNAI	VOMM	Y	Y	Y	N
	DELHI FIR / SRR	VIDF	DELHI/INDIRA GHANDI INTL	VIDP	Y	Y	N	N
	KOLKATA FIR / SRR	VECF	KOLKATA/KOLKATA	VECC	Y	Y	N	N
	MUMBAI FIR / SRR	VABF	MUMBAI/CHHATRAPATI SHIVAJI INTL.	VABB	Y	Y	Y	N
INDONESIA	JAKARTA FIR/UIR / SRR	WIIF	JAKARTA/SOEKARNO-HATTA (COMM CENTER)	WIII	Y	Y	Y	N
	UJUNG PANDANG FIR/UIR / SRR	WAAF	UJUNG PANDANG/HASANUDDIN (COMM CENTER)	WAAA	Y	Y	Y	N

State	FIR or CTA Where Meteorological Service is Required		Responsible Meteorological Watch Office		Meteorological Service To Be Provided			
	Name	ICAO Location Indicator	Name	ICAO Location Indicator	SIGMET (WS)	SIGMET (WV)	SIGMET (WC)	AIRMET (WA)
1	2	3	4	5	6	7	8	9
JAPAN	FUKUOKA FIR / TOKYO SRR	RJJJ	TOKYO (CITY)	RJTD	Y	Y	Y	N
LAO PEOPLE'S DEMOCRATIC REPUBLIC	VIENTIANE FIR / SRR	VLVT	VIENTIANE/WATTAY	VLVT	Y	Y	Y	N
MALAYSIA	KOTA KINABALU FIR / SRR KUALA LUMPUR FIR / SRR	WBFC WMFC	SEPANG/KL INTL AIRPORT	WMKK	Y	Y	Y	N
MALDIVES	MALE FIR / SRR	VRMF	MALE/INTL	VRMM	Y	Y	Y	N
MONGOLIA	ULAANBAATAR FIR / SRR	ZMUB	ULAANBAATAR	ZMUB	Y	Y	N	N
MYANMAR	YANGON FIR / SRR	VYYY	YANGON INTL	VYYY	Y	Y	Y	N
NAURU	NAURU FIR / SRR	ANAU	NAURU I.[15]	ANYN	Y	Y	Y	N
NEPAL	KATHMANDU FIR / SRR	VNSM	KATHMANDU	VNKT	Y	Y	N	N
NEW ZEALAND	AUCKLAND OCEANIC FIR / SRR NEW ZEALAND FIR / SRR	NZZO NZZC	WELLINGTON (AVIATION WEATHER CENTRE)	NZKL	Y	Y	Y	N
PAKISTAN	KARACHI FIR / SRR	OPKR	KARACHI/JINNAH INT'L	OPKC	Y	Y	Y	N
	LAHORE FIR / SRR	OPLR	LAHORE/ALLAMA IQBAL INT'L	OPLA	Y	Y	N	N
PAPUA NEW GUINEA	PORT MORESBY FIR / SRR	AYPY	PORT MORESBY INTL	AYPY	Y	Y	Y	N
PHILIPPINES	MANILA FIR / SRR	RPHI	MANILA/NINOY AQUINO INTL, PASAY CITY, METRO MANILA	RPLL	Y	Y	Y	N
REPUBLIC OF KOREA	INCHEON FIR / SRR	RKRR	INCHEON	RKSI	Y	Y	Y	N
SINGAPORE	SINGAPORE FIR / SRR	WSJC	SINGAPORE/CHANGI	WSSS	Y	Y	Y	N
SOLOMON ISLANDS	HONIARA FIR / SRR	AGGG	HONIARA (HENDERSON)	AGGH	Y	Y	Y	N
SRI LANKA	COLOMBO FIR / SRR	VCBI	BANDARANAIKE INTL AIRPORT COLOMBO	VCBI	Y	Y	Y	N
THAILAND	BANGKOK FIR / SRR	VTBB	BANGKOK/SUVARNABHUMI INTL AIRPORT	VTBS	Y	Y	Y	N
UNITED STATES	ANCHORAGE FIR	PAZA	ANCHORAGE	PAWU	Y	N	Y	N
	OAKLAND OCEANIC / HONOLULU SRR[16]	KZAK	HONOLULU	PHFO	Y	Y	Y	N
	OAKLAND OCEANIC FIR[17]	KZAK	KANSAS CITY	KKCI	Y	N	Y	N
VIET NAM	HANOI FIR / SRR HO-CHI-MINH FIR / SRR	VVNB VVTS	GIA LAM	VVGL	Y	Y	Y	N

Notes:

1. Limited by the coordinates: 27S/128E; 27S/135E; 26S/138E; 2806S/14012E; 29S/142E; 3414S/14205E; 3345S/14045E; 40S/14045E; 45S/14045E; 45S/129E; 33S/129E; 30S/129E; 2715S/12830E

2. Outside the AOR of YBTL MWO and limited by the coordinates: 0937S/14102E; 0916S/14203E; 0913S/14206E; 0911S/14214E; 0914S/14217E; 0922S/14230E; 0922S/14230E; 0923S/14236E; 0919S/14248E; 0908S/14352E; 0924S/14414E; 0957S/14405E; 1130S/14402E; 1144S/14404E; 12S/144E; 12S/155E; 14S/155E; 14S/16115E; 1740S/163E; 2830S/163E; 2830S/155E; 2850S/15316E; 29S/150E; 29S/14330E; 26S/138E; 14S/138E; 0937S/14102E

~~3. Limited by the coordinates: 26S/138E; 29S/143E; 29S/142E; 2806S/14012E; 26S/138E~~

4. Limited by the coordinates: 1055S/12447E; 0920S/12650E; 07S/135E; 0950S/13940E; 0950S/141E; 14S/138E; 18S/138E; 2215S/138E; 26S/138E; 2218S/13638E; 2128S/13609E; 2111S/13134E; 2151S/13058E; 2313S/12828E; 2322S/12629E; 2327S/12415E; 2250S/12330E; 2030S/12330E; 20S/129E; 16S/12915E; 1528S/12806E; 1450S/12825E; 14S/12730E; 1345S/12609E; 14S/124E; 1055S/12447E

5. Limited by the coordinates: 2250S/12330E; 2327S/12415E; 2322S/12629E; 2313S/12828E; 2151S/13058E; 2111S/13134E; 2128S/13609E; 2218S/13638E; 26S/138E; 27S/135E; 2715S/12830E; 25S/12815E; 25S/12330E; 2250S/12330E

6. Limited by the coordinates: 40S/14045E; 40S/143E; 3953S/14353E; 4006S/14759E; 40S/150E; 45S/150E; 45S/14045E; 40S/14045E

7. Limited by the coordinates: 3730S/15033E; 3730S/163E; 45S/163E; 45S/150E; 4434S/150E; 4351S/15040E; 43S/151E; 3811S/15019E; 3730S/15033E

8. Limited by the coordinates: 3345S/14045E; 3414S/14205E; 3510S/14728E; 3730S/150E; 3730S/15033E; 3811S/15019E; 43S/151E; 4351S/15040E; 4434S/150E; 40S/150E; 4006S/14759E; 3953S/14353E; 40S/143E; 40S/14045E; 3811S/14045E; 3345S/14045E.

9. Limited by the coordinates: 2311S/12831E; 2313S/12827E; 2321S/12631E; 2326S/12414E; 2133S/12226E; 2015S/12113E; 1858S/1203E; 1752S/11821E; 148S/1158E; 12S/11430E; 12S/12319E; 12S/12320E; 1055S/12446E; 140S/1240E; 1345S/1268E; 140S/12730E; 1449S/12825E; 1528S/1286E; 16S/12915E; 20S/1290E

10. Limited by the coordinates: 12S/11430E; 148S/1158E; 1752S/11821E; 1858S/1203E; 2015S/12113E; 2133S/12226E; 2326S/12414E; 2321S/12631E; 2313S/12827E; 2311S/12831E; 25S/12815E; 2715S/12830E; 30S/1290E; 50S/1290E; 50S/75E; 60S/75E; 20S/78E; 20S/92E; 12S/107E

11. Limited by the coordinates: 29S/14632E; 29S/150E; 2850S/15328E; 2830S/155E; 2830S/163E; 3730S/163E; 3730S/15033E; 3657S/15045E; then east of the minor arc of a circle of 120NM radius centred on 3457S/15032E; 3519S/15256E; 3421S/15140E; 3359S/15201E; 3351S/15154E; 3328S/15148E; 3315S/15126E; 3312S/15114E; 3320S/15042E; 3327S/15033E; 3206S/14850E; 29S/14632E

12. Limited by the coordinates: 29S/142E; 29S/14330E; 29S/14632E; 3206S/14850E; 3327S/15033E; 3320S/15042E; 3312S/15114E; 3315S/15126E; 3328S/15148E; 3351S/15154E; 3359S/15201E; 3421S/15140E; 3519S/15256E; then east of the minor arc of a circle of 120NM radius centred on 3457S/15032E; 3657S/15045E; 3730S/15033E; 3730S/150; 3510S/14728E; 3414S/14205E; 29S/142E.

~~13. Limited by the coordinates: 14S/138E; 10S/141E; 09S/142E; 09S/144E; 13S/145E; 15S/147E; 1817S/148E; 2309S/15252E; 2334S/14811E; 1818S/14332E; 18S/138E; 14S/138E~~

14. PHNOM PENH MWO not implemented, however arrangement made for issuance of SIGMET by CHENGDU/SHUANGLIU MWO

15. NAURU I. MWO not implemented, however arrangement made for issuance of SIGMET by PORT MORESBY INTL MWO

16. FIR South of 30N, East of 130E and West of 140W, Honolulu SRR

17. North of 30N of Oakland Oceanic FIR (excluding KZOA); South of 30N between 120W and 140W

TABLE MET II-2 - AERODROME METEOROLOGICAL OFFICES

Explanation of the Table

Column

1 Name of the State where meteorological service is required

2 Name of the AOP aerodrome where meteorological service is required
Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

3 ICAO location indicator of the AOP aerodrome

4 Designation of AOP aerodrome:
RG - international general aviation, regular use

RS - international scheduled air transport, regular use
RNS - international non-scheduled air transport, regular use
AS - international scheduled air transport, alternate use
ANS - international non-scheduled air transport, alternate use

5 Name of the aerodrome meteorological office responsible for the provision of meteorological service
Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

6 ICAO location indicator of the responsible aerodrome meteorological office

7 Requirement for METAR/SPECI from the aerodrome concerned, where:
Y – Yes, required
N – No, not required

~~8~~ ~~Requirement for information on the state of the runway provided by the appropriate airport authority to be included as supplementary information in METAR/SPECI from the aerodrome concerned, where:~~
~~Y – Yes, required~~
~~N – No, not required~~

9 Requirement for trend forecast to be appended to METAR/SPECI from the aerodrome concerned, where
Y – Yes, required
N – No, not required

10 Requirement for TAF from the aerodrome concerned, where
~~C - Requirement for 9-hour validity aerodrome forecasts in TAF code (9H)~~
T - Requirement for 12/18/24-hour validity aerodrome forecasts in TAF code (12/18/24H)
X - Requirement for 30-hour validity aerodrome forecasts in TAF code (30H)
N – No, not required

11 Requirement for maximum and minimum temperature (expected to occur during the period of validity of the TAF) to be included in TAF from the aerodrome concerned, where:
Y – Yes, required
N – No, not required

12 Availability of METAR/SPECI and TAF from the aerodrome concerned, where:
F – Full availability : OPMET information as listed issued for the aerodrome all through the 24-hour period
P – Partial availability: OPMET information as listed not issued for the aerodrome for the entire 24-hour period

TABLE MET II-2 - AERODROME METEOROLOGICAL OFFICES

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	METAR/SPECI	~~State of the runway~~	Trend forecast	TAF	Temperature Tx/Tn	METAR/SPECI and TAF availability
1	2	3	4	5	6	7	~~8~~	9	10	11	12
AFGHANISTAN	KABUL INTERNATIONAL	OAKB	RS	KABUL INTERNATIONAL	OAKB	Y		Y	T		F
	KANDAHAR	OAKN	AS	KABUL INTERNATIONAL	OAKB	Y			T		F
AMERICAN SAMOA (UNITED STATES)	PAGO PAGO INTERNATIONAL,TUTUILA I.	NSTU	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
AUSTRALIA	ADELAIDE/ADELAIDE INTL	YPAD	RS	ADELAIDE/ADELAIDE INTL	YPAD	Y		Y	X		F
	ALICE SPRINGS	YBAS	AS	DARWIN/DARWIN INTL	YPDN	Y			T		F
	BRISBANE/BRISBANE INTL	YBBN	RS	BRISBANE/BRISBANE INTL	YBBN	Y		Y	X		F
	CAIRNS/CAIRNS INTL	YBCS	RS	~~TOWNSVILLE/TOWNSVILLE INTL~~ CAIRNS/CAIRNS INTL	YBTL	Y		Y	T		F
	CHRISTMAS ISLAND	YPXM	RS	PERTH/PERTH INTL	YPPH	Y			T		F
	COCOS (KEELING) ISLANS INTL	YPCC	RS	PERTH/PERTH INTL	YPPH	Y			T		F
	DARWIN/DARWIN INTL	YPDN	RS	DARWIN/DARWIN INTL	YPDN	Y		Y	X		F
	HOBART	YMHB	RS	HOBART	YMHB	Y			T		F
	MELBOURNE/MELBOURNE INTL	YMML	RS	MELBOURNE/MELBOURNE INTL	YMML	Y		Y	X		F
	NORFOLK ISLAND	YSNF	RS	SYDNEY/SYDNEY (KINGSFORD SMITH) INTL	YSSY	Y			T		F
	PERTH/PERTH INTL	YPPH	RS	PERTH/PERTH INTL	YPPH	Y		Y	X		F
	PORT HEDLAND	YPPD	RS	PERTH/PERTH INTL	YPPH	Y			T		F
	ROCKHAMPTON	YBRK	AS	BRISBANE/BRISBANE INTL	YBBN	Y		~~Y~~N	T		F
	SYDNEY/SYDNEY (KINGSFORD SMITH) INTL	YSSY	RS	SYDNEY/SYDNEY (KINGSFORD SMITH) INTL	YSSY	Y		Y	X		F
	TINDAL	YPTN	AS	DARWIN/DARWIN INTL	YPDN	Y		Y	T		F
	TOWNSVILLE/TOWNSVILLE INTL	YBTL	RS	TOWNSVILLE/TOWNSVILLE INTL	YBTL	Y		Y	T		F
BANGLADESH	M.A. HANNAN INTL. CHITTAGONG	VGEG	RS		VGZR	Y		Y	T		F
BHUTAN	PARO/INTL	VQPR	RS	PARO/INTL	VQPR	Y					F
BRUNEI DARUSSALAM	BRUNEI/INTL	WBSB	RS	BRUNEI/INTL	WBSB	Y			X		F
CAMBODIA	PHNOM PENH	VDPP	RS	PHNOM PENH	VDPP	Y		Y	T		P
	SIEM REAP	VDSR	AS	PHNOM PENH	VDPP	Y			T		P
CHINA	BEIJING/CAPITAL	ZBAA	RS	BEIJING/CAPITAL	ZBAA	Y		Y	X		F
	CHANGSHA/HUANGHUA	ZGHA	RS	GUANGZHOU/BAIYUN	ZGGG	Y			T		F
	CHENGDU/SHUANGLIU	ZUUU	RS	CHENGDU/SHUANGLIU	ZUUU	Y			T		F
	CHONGQING/JIANGBEI	ZUCK	RS	CHENGDU/SHUANGLIU	ZUUU	Y		Y	T		F
	DALIAN/ZHOUSHUIZI	ZYTL	RS	SHENYANG/TAOXIAN	ZYTX	Y			T		F
	FUZHOU/CHANGLE	ZSFZ	RS	SHANGHAI/HONGQIAO	ZSSS	Y			T		F
	GAOXIONG	RCKH	RS	TAIBEI CITY/TAIBEI INTL AP	RCTP	Y		Y	X		F
	GUANGZHOU/BAIYUN	ZGGG	RS	GUANGZHOU/BAIYUN	ZGGG	Y		Y	X		F
	GUILIN/LIANGJIANG	ZGKL	RS	GUANGZHOU/BAIYUN	ZGGG	Y			T		F
	HANGZHOU/XIAOSHAN	ZSHC	RS	SHANGHAI/HONGQIAO	ZSSS	Y			T		F
	HARBIN/TAIPING	ZYHB	RS	SHENYANG/TAOXIAN	ZYTX	Y			T		F
	HEFEI/XINQIAO	ZSOF	AS	SHANGHAI/HONGQIAO	ZSSS	Y			T		F
	HUHHOT/BAITA	ZBHH	RS	BEIJING/CAPITAL	ZBAA	Y			T		F
	JINAN/YAOQIANG	ZSJN	RS	SHANGHAI/HONGQIAO	ZSSS	Y			T		F

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	METAR/SPECI	~~State of the runway~~	Trend forecast	TAF	Temperature Tx/Tn	METAR/SPECI and TAF availability
1	2	3	4	5	6	7	8	9	10	11	12
	KASHI/KASHI	ZWSH	RS	URUMQI/DIWOPU	ZWWW	Y			X		F
	KUNMING/CHANGSHUI	ZPPP	RS	CHENGDU/SHUANGLIU	ZUUU	Y			X		F
	LANZHOU/ZHONGCHUAN	ZLLL	AS	XI'AN/XIANYANG	ZLXY	Y			T		F
	NANJING/LUKOU	ZSNJ	RS	SHANGHAI/HONGQIAO	ZSSS	Y			T		F
	NANNING/WUXU	ZGNN	AS	GUANGZHOU/BAIYUN	ZGGG	Y			T		F
	QINGDAO/LIUTING	ZSQD	RS	SHANGHAI/HONGQIAO	ZSSS	Y			T		F
	SANYA/PHOENIX	ZJSY				Y			T		F
	SHANGHAI/HONGQIAO	ZSSS	RS	SHANGHAI/HONGQIAO	ZSSS	Y		Y	T		F
	SHANGHAI/PUDONG	ZSPD	RS	SHANGHAI/HONGQIAO	ZSSS	Y		Y	X		F
	SHENYANG/TAOXIAN	ZYTX	RS	SHENYANG/TAOXIAN	ZYTX	Y		Y	T		F
	SHENZHEN/BAOAN	ZGSZ	RS	GUANGZHOU/BAIYUN	ZGGG	Y			X		F
	TAIBEI CITY/TAIBEI INTL AP	RCTP	RS	TAIBEI CITY/TAIBEI INTL AP	RCTP	Y		Y	X		F
	TAIBEI/SONGSHAN	RCSS	AS	TAIBEI CITY/TAIBEI INTL AP	RCTP	Y			T		F
	TAIYUAN/WUSU	ZBYN	AS	BEIJING/CAPITAL	ZBAA	Y			T		F
	TIANJIN/BINHAI	ZBTJ	RS	BEIJING/CAPITAL	ZBAA	Y			X		F
	URUMQI/DIWOPU	ZWWW	RS	URUMQI/DIWOPU	ZWWW	Y			X		F
	WUHAN/TIANHE	ZHHH	RS	GUANGZHOU/BAIYUN	ZGGG	Y		Y	T		F
	XIAMEN/GAOQI	ZSAM	RS	SHANGHAI/HONGQIAO	ZSSS	Y		Y	T		F
	XI'AN/XIANYANG	ZLXY	RS	XI'AN/XIANYANG	ZLXY	Y		Y	T		F
	XICHANG/QUINGSHAN	ZUXC	RNS	CHENGDU/SHUANGLIU	ZUUU	Y					F
COOK ISLANDS	RAROTONGA INTL.	NCRG	RS	NADI/INTL	NFFN	Y			T		F
DEMOCRATIC PEOPLE'S REPUBLIC OF KOREA	SUNAN	ZKPY	RS	SUNAN	ZKPY	Y		Y	T		F
FIJI	NADI/INTL	NFFN	RS	NADI/INTL	NFFN	Y		Y	T		F
	NAUSORI/INTL	NFNA	RS	NADI/INTL	NFFN	Y			T		F
FRENCH POLYNESIA (FRANCE)	TAHITI FAAA	NTAA	RS	TAHITI FAAA	NTAA	Y		Y	T		F
HONG KONG, CHINA (CHINA)	HONG KONG/INTERNATIONAL	VHHH	RS	HONG KONG/INTERNATIONAL	VHHH	Y		Y	X		F
INDIA	AHMEDABAD	VAAH	RS	AHMEDABAD	VAAH	Y			X		F
	AMRITSAR	VIAR	RS	DELHI (IGI)	VIDP	Y			X		F
	BANGALORE INTL. AIRPORT	VOBL	RS	BANGALORE INTL. AIRPORT	VOBL	Y		Y	X		F
	CALICUT	VOCL	RS	THIRUVANANTHAPURAM	VOTV	Y			X		F
	CHENNAI	VOMM	RS	CHENNAI	VOMM	Y		Y	X		F
	COCHIN INTL.	VOCI	RS	THIRUVANANTHAPURAM	VOTV	Y		Y	X		F
	COIMBATORE	VOCB	RS	CHENNAI	VOMM	Y			T		F
	DELHI (IGI)	VIDP	RS	DELHI (IGI)	VIDP	Y		Y	X		F
	GAYA	VEGY	RS	PATNA	VEPT	Y			T		F
	GUWAHATI	VEGT	RS	GUWAHATI	VEGT	Y		Y	T		F
	HYDERABAD INTL. AIRPORT	VOHS	RS	HYDERABAD INTL. AIRPORT	VOHS	Y		Y	X		F
	JAIPUR	VIJP	RS	JAIPUR	VIJP	Y		Y	T		F
	KOLKATA	VECC	RS	KOLKATA	VECC	Y		Y	X		F

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	METAR/SPECI	~~State of the runway~~	Trend forecast	TAF	Temperature Tx/Tn	METAR/SPECI and TAF availability
1	2	3	4	5	6	7	8	9	10	11	12
	LUCKNOW	VILK	RS	LUCKNOW	VILK	Y		Y	T		F
	MANGALORE	VOML	RS	BANGALORE INTL. AIRPORT	VOBL	Y			T		F
	MUMBAI	VABB	RS	MUMBAI	VABB	Y		Y	X		F
	NAGPUR	VANP	RS	NAGPUR	VANP	Y		Y	T		F
	PATNA	VEPT	RS	PATNA	VEPT	Y			X		F
	THIRUVANANTHAPURAM	VOTV	RS	THIRUVANANTHAPURAM	VOTV	Y			X		F
	TIRUCHIRAPPALLI	VOTR	RS	CHENNAI	VOMM	Y			T		F
	VARANASI	VIBN	RS	LUCKNOW	VILK	Y			X		F
INDONESIA	AMBON/PATTIMURA	WAPP	RNS	AMBON/PATTIMURA	WAPP	Y			T		F
	BALI INTL/NGURAH RAI	WADD	RS	BALI INTL/NGURAH RAI	WADD	Y			X		F
	BALIKPAPAN/SEPINGGAN	WALL	RS	BALIKPAPAN/SEPINGGAN	WALL	Y			X		F
	BANJARMASIN/SYAMSUDIN NOOR	WAOO	AS	BANJARMASIN/SYAMSUDIN NOOR	WAOO	Y			T		F
	BATAM/HANG NADIM	WIDD	AS	BATAM/HANG NADIM	WIDD	Y			T		F
	BIAK/FRANS KAISIEPO	WABB	RS	BIAK/FRANS KAISIEPO	WABB	Y		Y	X		F
	JAKARTA INTL/SOEKARNO-HATTA	WIII	RS	JAKARTA INTL/SOEKARNO-HATTA	WIII	Y		Y	X		F
	JAKARTA/HALIM PERDANAKUSUMA	WIHH	RNS	JAKARTA/HALIM PERDANAKUSUMA	WIHH	Y		Y	T		P
	JAYAPURA/SENTANI	WAJJ	RS	JAYAPURA/SENTANI	WAJJ	Y			T		F
	KUPANG/EL-TARI	WATT	RS	KUPANG/EL-TARI	WATT	Y			T		F
	MAKASSAR/SULTAN HASANUDDIN	WAAA	RNS	MAKASSAR/SULTAN HASANUDDIN	WAAA	Y		Y	X		F
	MANADO/SAMRATULANGI	WAMM	RS	MANADO/SAMRATULANGI	WAMM	Y			X		F
	MEDAN/KUALANAMU	WIMM	RS	MEDAN/KUALANAMU	WIMM	Y		Y	T		F
	MERAUKE/MOPAH	WAKK	RNS	JAYAPURA/SENTANI	WAJJ	Y			T		P
	PALEMBANG/SULTAN MAHMUD BADARUDDIN II	WIPP	RNS	PALEMBANG/SULTAN MAHMUD BADARUDDIN II	WIPP	Y			T		F
	PANDANG/MINANGKABAU	WIPT		PANDANG/MINANGKABAU	WIPT	Y		Y	T		F
	PEKANBARU/SULTAN SYARIF KASIM II	WIBB	RS	PEKANBARU/SULTAN SYARIF KASIM II	WIBB	Y			T		F
	PONTIANAK/SUPADIO	WIOO	RS	PONTIANAK/SUPADIO	WIOO	Y			T		F
	SURABAYA/JUANDA	WARR	RS	SURABAYA/JUANDA	WARR	Y			T		F
	TANJUNG PINANG/RAJA HAJI FISABILILLAH	WIDN	RS	BATAM/HANG NADIM	WIDD	Y			T		P
	TARAKAN/JUWATA	WALR	RS	BALIKPAPAN/SEPINGGAN	WALL	Y			T		P
JAPAN	CHUBU CENTRAIR INTL	RJGG	RS	TOKYO (CITY)	RJTD	Y			X		F
	FUKUOKA	RJFF	RS	TOKYO (CITY)	RJTD	Y			T		F
	HAKODATE	RJCH	AS	TOKYO (CITY)	RJTD	Y			X		F
	HIROSHIMA	RJOA	RS	TOKYO (CITY)	RJTD	Y			T		F
	KAGOSHIMA	RJFK	RS	TOKYO (CITY)	RJTD	Y			T		F
	KANSAI INTL	RJBB	RS	TOKYO (CITY)	RJTD	Y		Y	X		F
	KUMAMOTO	RJFT	RS	TOKYO (CITY)	RJTD	Y			T		F
	NAGASAKI	RJFU	RS	TOKYO (CITY)	RJTD	Y			T		F
	NAHA	ROAH	RS	TOKYO (CITY)	RJTD	Y			X		F
	NARITA INTL	RJAA	RS	TOKYO (CITY)	RJTD	Y		Y	X		F
	NIIGATA	RJSN	RS	TOKYO (CITY)	RJTD	Y			T		F
	OITA	RJFO	RS	TOKYO (CITY)	RJTD	Y			T		F
	OKAYAMA	RJOB	RS	TOKYO (CITY)	RJTD	Y			T		F

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					
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1	2	3	4	5	6	7	8	9	10	11	12
	OSAKA INTL	RJOO	AS	TOKYO (CITY)	RJTD	Y			T		F
	SAPPORO/NEW CHITOSE	RJCC	RS	TOKYO (CITY)	RJTD	Y			X		F
	SENDAI	RJSS	RNS	TOKYO (CITY)	RJTD	Y			X		F
	TAKAMATSU	RJOT	RS	TOKYO (CITY)	RJTD	Y			T		F
	TOKYO INTL	RJTT	AS	TOKYO (CITY)	RJTD	Y			T		F
KIRIBATI	CHRISTMAS ISLAND	PLCH	RS	NADI/INTL	NFFN	Y			T		F
	TARAWA/BONRIKI INTL	NGTA	RS	NADI/INTL	NFFN	Y			T		F
LAO PEOPLE'S DEMOCRATIC REPUBLIC	VIENTIANE(WATTAY)	VLVT	RS	VIENTIANE(WATTAY)	VLVT	Y		Y	T		P
MACAO, CHINA (CHINA)	MACAO/INTL AIRPORT	VMMC	RS	MACAO/INTL AIRPORT	VMMC	Y		Y	X		F
MALAYSIA	JOHOR BAHRU/SULTAN ISMAIL	WMKJ	RS	SEPANG/KL INTERNATIONAL AIRPORT	WMKK	Y			T		F
	KOTA KINABALU/INTL	WBKK	RS	KOTA KINABALU/INTL	WBKK	Y		Y	T		F
	KUCHING/INTL	WBGG	RS	KOTA KINABALU/INTL	WBKK	Y			T		F
	PENANG/INTL	WMKP	RS	SEPANG/KL INTERNATIONAL AIRPORT	WMKK	Y			T		F
	PULAU LANGKAWI/INTL	WMKL	RS	SEPANG/KL INTERNATIONAL AIRPORT	WMKK	Y			T		F
	SEPANG/KL INTERNATIONAL AIRPORT	WMKK	RS	SEPANG/KL INTERNATIONAL AIRPORT	WMKK	Y		Y	X		F
MALDIVES	GAN/GAN INTERNATIONAL AIRPORT	VRMG	AS	IBRAHIM NASIR INTERNATIONAL AIRPORT	VRMM	Y			X		F
	HANIMAADHOO	VRMH	RS	IBRAHIM NASIR INTERNATIONAL AIRPORT	VRMM	Y			X		F
	IBRAHIM NASIR INTERNATIONAL AIRPORT	VRMM	RS	IBRAHIM NASIR INTERNATIONAL AIRPORT	VRMM	Y			X		F
	VILLA AIRPORT MAAMIGILI	VRMV	RS	IBRAHIM NASIR INTERNATIONAL AIRPORT	VRMM	Y					
MARSHALL ISLANDS	MARSHALL ISLANDS/INTL MAJURO ATOLL	PKMJ	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		P
MICRONESIA (FEDERATED STATES OF)	POHNPEI INTL,POHNPEI ISLAND	PTPN	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		P
	WENO ISLAND ,FM CHUUK INTL.	PTKK	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	YAP INTL,YAP ISLAND	PTYA	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
MONGOLIA	ULAANBAATAR/CHINGGIS KHAAN	ZMUB	RS	ULAANBAATAR/CHINGGIS KHAAN	ZMUB	Y		Y	X		F
MYANMAR	YANGON INTERNATIONAL	VYYY	RS	YANGON INTERNATIONAL	VYYY	Y		Y	T		F
NAURU	NAURU AIRPORT	ANYN	RS	NAURU AIRPORT	ANYN	Y		Y	T		F
NEPAL	KATHMANDU	VNKT	RS	KATHMANDU	VNKT	Y		Y	T		F
NEW CALEDONIA (FRANCE)	NOUMEA LA TONTOUTA	NWWW	RS	NOUMEA LA TONTOUTA	NWWW	Y		Y	T		F
NEW ZEALAND	AUCKLAND INTL	NZAA	RS	KELBURN (MET OFFICE)	NZKL	Y		Y	T		F

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	METAR/SPECI	~~State of the runway~~	Trend forecast	TAF	Temperature Tx/Tn	METAR/SPECI and TAF availability
1	2	3	4	5	6	7	8	9	10	11	12
	CHRISTCHURCH INTL	NZCH	RS	KELBURN (MET OFFICE)	NZKL	Y		Y	T		F
	WELLINGTON INTL	NZWN	RS	KELBURN (MET OFFICE)	NZKL	Y		Y	T		F
NIUE (NEW ZEALAND)	NIUE INTL	NIUE	RS	NADI/INTL	NFFN	Y			T		F
NORTHERN MARIANA ISLANDS (UNITED STATES)	ANDERSON AFB,GUAM ISLAND	PGUA	AS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	FRANCISCO C. ADA/SAIPAN INTERNATIONAL, OBYAN	PGSN	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	GUAM INTERNATIONAL, GUAM ISLAND	PGUM	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			X		F
	ROTA/INTL,ROTA I.	PGRO	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		P
PAKISTAN	GWADAR/INTL.	OPGD	RS	KARACHI/JINNAH INT'L	OPKC	Y			T		F
	ISLAMABAD/BENAZIR BHUTTO INT'L	OPRN	RS	KARACHI/JINNAH INT'L	OPKC	Y		Y	X		F
	KARACHI/JINNAH INT'L	OPKC	RS	BINDO	OPBI	Y			X		F
	LAHORE/ALLAMA IQBAL INT'L	OPLA	RS	LAHORE/ALLAMA IQBAL INT'L	OPLA	Y		Y	X		F
	NAWABSHAH	OPNH	AS	LAHORE/ALLAMA IQBAL INT'L	OPLA	Y			T		F
	PESHAWAR/INTL.	OPPS	RS	LAHORE/ALLAMA IQBAL INT'L	OPLA	Y			X		F
PALAU	BABELTHUAP/KOROR, BABELTHUAP ISLAND	PTRO	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
PAPUA NEW GUINEA	PORT MORESBY INTL	AYPY	RS	PORT MORESBY INTL	AYPY	Y			T		F
	VANIMO	AYVN				Y					F
PHILIPPINES	DAVAO/FRANCISCO BANGOY INTL	RPMD	RNS	MANILA/NINOY AQUINO INTL	RPLL	Y		Y	T		P
	LAOAG, LAOAG INTL	RPLI	AS	MANILA/NINOY AQUINO INTL	RPLL	Y		Y	T		P
	LAPU-LAPU/MACTAN INTL	RPVM	RS	MANILA/NINOY AQUINO INTL	RPLL	Y		Y	X		F
	MANILA/NINOY AQUINO INTL	RPLL	RS	MANILA/NINOY AQUINO INTL	RPLL	Y		Y	X		F
	SUBIC BAY,SUBIC BAY INTL	RPLB	RNS	MANILA/NINOY AQUINO INTL	RPLL	Y		Y	T		P
	ZAMBOANGA INTL	RPMZ	RNS	MANILA/NINOY AQUINO INTL	RPLL	Y		Y	T		P
REPUBLIC OF KOREA	CHEONGJU	RKTU	RS	INCHEON INTL	RKSI	Y			T		F
	DAEGU INTL	RKTN	RS	INCHEON INTL	RKSI	Y			T		F
	GIMHAE INTL	RKPK	RS	INCHEON INTL	RKSI	Y			T		F
	GIMPO	RKSS	AS	INCHEON INTL	RKSI	Y		Y	X		F
	INCHEON INTL	RKSI	RS	INCHEON INTL	RKSI	Y		Y	X		F
	JEJU INTL	RKPC	RS	INCHEON INTL	RKSI	Y			X		F
	MUAN	RKJB	RS	INCHEON INTL	RKSI	Y			X		F
	YANGYANG	RKNY	RS	INCHEON INTL	RKSI	Y			T		F
SAMOA	FALEOLO/INTL	NSFA	RS	FALEOLO/INTL	NSFA	Y		Y	T		F
SINGAPORE	PAYA LEBAR (RSAF)	WSAP	AS	SINGAPORE/CHANGI	WSSS	Y			X		F
	SELETAR	WSSL	RS	SINGAPORE/CHANGI	WSSS	Y			X		F
	SINGAPORE/CHANGI	WSSS	RS	SINGAPORE/CHANGI	WSSS	Y		Y	X		F
SOLOMON ISLANDS	HONIARA (HENDERSON)	AGGH	RS	HONIARA (HENDERSON)	AGGH	Y		Y	T		F

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	METAR/SPECI	~~State of the runway~~	Trend forecast	TAF	Temperature Tx/Tn	METAR/SPECI and TAF availability
1	2	3	4	5	6	7	8	9	10	11	12
SRI LANKA	HINGURAKGODA/MINNERIYA	VCCH				Y					F
	KATUNAYAKE/BANDARANAIKE INTERNATIONAL AIRPORT COLOMBO	VCBI	RS	KATUNAYAKE/BANDARANAIKE INTERNATIONAL AIRPORT COLOMBO	VCBI	Y		Y	X		F
	MATTALA/MATTALA RAJAPAKSA INTERNATIONAL AIRPORT	VCRI	RS	MATTALA/MATTALA RAJAPAKSA INTERNATIONAL AIRPORT	VCRI	Y		Y	X		F
THAILAND	BANGKOK/DON MUEANG INTL AIRPORT	VTBD	RS	BANGKOK/SUVARNABHUMI INTL AIRPORT	VTBS	Y		Y	X		F
	BANGKOK/SUVARNABHUMI INTL AIRPORT	VTBS	RS	BANGKOK/SUVARNABHUMI INTL AIRPORT	VTBS	Y		Y	X		F
	CHIANG MAI/CHIANG MAI INTL. AIRPORT	VTCC	RS	CHIANG MAI/CHIANG MAI INTL. AIRPORT	VTCC	Y		Y	X		F
	CHIANG RAI/MAE FAH LUANG-CHIANG RAI INTL AIRPORT	VTCT	RS	CHIANG MAI/CHIANG MAI INTL. AIRPORT	VTCC	Y		Y	X		F
	KHON KAEN	VTUK	RS	UBON RATCHATHANI	VTUU	Y			T		P
	KRABI	VTSG	RS	PHUKET/PHUKET INTL AIRPORT	VTSP	Y			T		F
	PHITSANULOK	VTPP	RS	CHIANG MAI/CHIANG MAI INTL. AIRPORT	VTCC	Y			T		P
	PHUKET/PHUKET INTL AIRPORT	VTSP	RS	PHUKET/PHUKET INTL AIRPORT	VTSP	Y		Y	X		F
	RAYONG/U-TAPAO PATTAYA INTL AIRPORT	VTBU	RS	RAYONG/U-TAPAO PATTAYA INTL AIRPORT	VTBU	Y			T		F
	SONGKHLA/HAT YAI INTL AIRPORT	VTSS	RS	SONGKHLA/HAT YAI INTL AIRPORT	VTSS	Y		Y	T		F
	SURAT THANI	VTSB	RS	SONGKHLA/HAT YAI INTL AIRPORT	VTSS	Y			T		P
	UBON RATCHATHANI	VTUU	RS	UBON RATCHATHANI	VTUU	Y		Y	T		F
TONGA	FUA'AMOTU INTL.	NFTF	RS	NADI/INTL	NFFN	Y			T		F
	VAVA'U	NFTV	RS	NADI/INTL	NFFN	Y			T		F
TUVALU	FUNAFUTI/INTL	NGFU	RS			Y			T		F
UNITED STATES	ANCHORAGE/ELMENDORF AFB,AK.	PAED	AS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	COLD BAY,AK.	PACD	AS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	FAIRBANKS INTERNATIONAL, AK.	PAFA	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			X		F
	FAIRBANKS/EIELSON AFB,AK.	PAEI	AS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	HILO INTERNATIONAL, HILO HI.	PHTO	AS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	HONOLULU INTERNATIONAL, OAHU, HI.	PHNL	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			X		F
	KAHULUI, HI.	PHOG	AS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	KING SALMON,AK.	PAKN	AS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			T		F
	TED STEVENS ANCHORAGE INTERNATIONAL, AK.	PANC	RS	WASHINGTON (NWS NATIONAL MET CENTER), DC.	KWBC	Y			X		F
VANUATU	PORT VILA/BAUERFIELD	NVVV	RS	PORT VILA/BAUERFIELD	NVVV	Y			T		F
	SANTO/PEKOA	NVSS	RS	PORT VILA/BAUERFIELD	NVVV	Y			T		F
VIET NAM	CAM RANH	VVCR	RS	CAM RANH	VVCR	Y		Y	T		F

State	AOP Aerodrome where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	METAR/SPECI	~~State of the runway~~	Trend forecast	TAF	Temperature Tx/Tn	METAR/SPECI and TAF availability
1	2	3	4	5	6	7	~~8~~	9	10	11	12
	CAN THO	VVCT	RS	CAN THO	VVCT	Y		Y	T		F
	DA NANG	VVDN	RS	DA NANG	VVDN	Y		Y	T		F
	HA NOI/NOI BAI	VVNB	RS	HA NOI/NOI BAI	VVNB	Y		Y	T		F
	HO CHI MINH/TAN SON NHAT	VVTS	RS	HO CHI MINH/TAN SON NHAT	VVTS	Y		Y	X		F
	HUE/PHU BAI	VVPB	RS	HUE/PHU BAI	VVPB	Y		Y	T		F
	PHU QUOC	VVPQ	RS	PHU QUOC	VVPQ	Y		Y	T		F
WALLIS AND FUTUNA ISLANDS (FRANCE)	WALLIS HIHIFO	NLWW	RS	NADI/INTL	NFFN	Y			T		F

TABLE MET II-3 – VOLMET BROADCASTS

Explanation of the Table

The transmitting station appears at the top of each block.

Names in lower case letters indicate aerodromes for which reports (routine or selected special) are required.

Names in upper-case letters indicate aerodromes for which forecasts are required.

TABLE MET II-3 – VOLMET BROADCASTS

PAC (FREQUENCIES 2863, 6679, 8828, 13282 kHz)

Tokyo	Hong Kong	Auckland
10–15 40–45	15–20 45–50	20–25 50–55
Tokyo (Narita) Tokyo (Haneda) Sapporo Chubu Osaka Fukuoka Incheon	Hong Kong Naha Taibei Gaoxiong Manila Mactan Guangzhou	Auckland Christchurch Wellington Nadi Nouméa Pago Pago Tahiti
TOKYO (NARITA) TOKYO (HANEDA)	HONG KONG	20–25 NADI NOUMÉA 50–55 AUCKLAND CHRISTCHURCH

PAC (FREQUENCIES 2863, 6679, 8828, 13282 kHz)

Honolulu		
10–15 40–45	15–20 45–50	20–25 50–55
Honolulu Hilo Kahului Agana	San Francisco Los Angeles Seattle Portland Sacramento Ontario Las Vegas	Anchorage Fairbanks King Salmon Elmendorf Cold Bay Vancouver
SIGMET	SIGMET	SIGMET
HONOLULU HILO AGANA	SAN FRANCISCO SEATTLE LOS ANGELES	ANCHORAGE FAIRBANKS VANCOUVER COLD BAY

ASIA (FREQUENCIES 2965, 6676, 11387 kHz)

Sydney	Kolkata	Bangkok	Karachi	Singapore	Mumbai
00–05 30–35	05–10 35–40	10–15 40–45	15–20 45–50	20–25 50–55	25–30 55–60
Sydney Brisbane Melbourne Townsville Adelaide Alice Springs Darwin Perth	Kolkata Delhi Dhaka Yangon Kathmandu	Bangkok Yangon Ha Noi Ho-Chi-Minh Phnom-Penh Utapao Vientiane	Karachi Islamabad Lahore Delhi Mumbai	Singapore Sebang Jakarta Kuching Brunei Kota Kinabalu Denpasar Penang	Mumbai Ahmadabad Chennai Colombo Karachi Male
00–05 SYDNEY BRISBANE	KOLKATA DELHI	BANGKOK YANGON	KARACHI LAHORE MUMBAI DELHI	20–25 SINGAPORE SEBANG	MUMBAI COLOMBO MALE
30–35 MELBOURNE	HO-CHI-MINH		SINGAPORE	50–55 SINGAPORE	

Sydney	Kolkata	Bangkok	Karachi	Singapore	Mumbai
00–05 30–35	05–10 35–40	10–15 40–45	15–20 45–50	20–25 50–55	25–30 55–60
PERTH				JAKARTA	

ASIA (FREQUENCIES 3458, 5673, 8849, 13285 kHz)

Guangzhou			Beijing		
00–05 30–35	05–10 35–40	10–15 40–45	15–20 45–50	20–25 50–55	25–30 55–60
Xiamen	Guangzhou Nanning	Changsha Chengdu Kunming Wuhan	Beijing Harbin Dalian Shenyang Hohhot Taiyuan Tianjin	Hangzhou Shanghai	Lanzhou Xían Urumqi XÍAN
	GUANGZHOU	CHENGDU	BEIJING	SHANGHAI	

~~**EXAMPLE FOR SPECIFIC REGIONAL REQUIREMENTS**~~

~~**TABLE MET II-MID-X -OFFSHORE STRUCTURES**~~

~~**EXPLANATION OF THE TABLE**~~

~~Column~~ –

~~1~~ ~~Name of the State where meteorological service is required~~

~~2~~ ~~Name of the offshore structure where meteorological service is required~~
~~*Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.*~~

~~3~~ ~~ICAO location indicator of the offshore structure~~

~~4~~ ~~Latitude of the offshore structure (in the form Nnnnn or Snnnn)~~

~~5~~ ~~Longitude of the offshore structure (in the form Ennnnn or Wnnnnn)~~

~~6~~ ~~Name of the meteorological office responsible for the provision of meteorological service~~
~~*Note: The name is extracted from the ICAO Location Indicators (Doc 7910) updated quarterly. If a State wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.*~~

~~7~~ ~~ICAO location indicator of the responsible meteorological office~~

~~8~~ ~~Availability of information on the sea surface temperature as supplementary information in METAR/SPECI from the offshore structure concerned, where:~~
~~Y - Yes, available~~
~~N - No, not available~~

~~9~~ ~~Availability of information on the state of the sea or significant wave height as supplementary information in METAR/SPECI from the offshore structure concerned, where:~~
~~Y - Yes, available~~
~~N - No, not available~~

~~10~~ ~~Availability of forecasts from the offshore structure concerned, where:~~
~~Y - Yes, available~~
~~N - No, not available~~

–
–

~~**EXAMPLE FOR SPECIFIC REGIONAL REQUIREMENTS**~~

–

~~**Appendix MET LLF to Part V (MET) Volume II**~~

–

~~**EUR REGION ONLY**~~

–

~~In the EUR Region, Section II of the GAMET area forecast should include the following information in addition to the provisions in Annex 3:~~

–

~~a) Short description of general weather situation in addition to the description of pressure centres and fronts;~~

–

~~b) Information about mean surface wind also for values less than 15 m/s (30kt);~~

~~c) Upper wind and temperature in mountainous areas for altitude 15000ft, or higher if necessary;~~

~~*Note – Upper wind and temperature information should have a horizontal resolution no more than 500km;*~~

~~d) Information about widespread surface visibility of 5000 m or more together with the weather phenomena (if any) causing a reduction of visibility and inserted between the upper wind and cloud information;~~

~~e) State of the sea and sea surface temperature; and~~

~~*Note – States under whose jurisdiction off-shore structure or other points of significance in support of off-shore helicopter operations are located should, in consultation with the appropriate operators, establish or arrange for the information on the state of the sea and sea surface temperature to be included in all low-level area forecasts.*~~

~~f) An outlook concerning expected hazardous weather phenomena during the following validity period.~~

~~*Note 1. – When the area forecast for low-level flights is issued as a GAMET, the following regional procedures should be followed:*~~

~~*i. the term "widespread" should be used to indicate a spatial coverage of more than 75 per cent of the area concerned; and*~~

~~*ii. the visibility and cloud base information in section II may be complemented in the form of visibility/cloud base categories.*~~

~~*Note 2. – Where combined cloud/visibility information is provided, this information should be in the form of visibility/cloud base categories and should be supplied for well-defined sub-areas and/or route segments. The boundaries of sub-areas and/or route segments for which forecasts for low-level flights are provided in condensed form should be published in the AIP. For each sub-area and/or route segment, the reference height to which the cloud-base information refers, should be specified.*~~

~~*Note 3. – Where visibility/cloud-base categories are used in low-level forecasts these should be as follows:*~~

~~*O – visibility equal to or more than 8 km and cloud-base equal to or higher than 600 m (2000 ft);*~~

~~*D – visibility equal to or more than 5 km but less than 8 km with cloud-base 300 m (1000 ft) or higher, or cloud-base equal to 300 m (1000 ft) or higher but less than 600 m (2000 ft) with visibility equal to or more than 8 km;*~~

~~*M – visibility equal to or more than 1.5 km but less than 5 km with cloud-base equal to or higher than 150 m (500 ft), or cloud-base equal to or higher than 150 m (500 ft) but less than 300 m (1000 ft) with visibility equal to or more than 5 km;*~~

~~*X – visibility less than 1.5 km and/or cloud-base less than 150 m (500 ft). The visibility/cloud-base category indicated in the forecast for a sub-area should refer to the prevailing conditions in the sub-area concerned. Cloud information should refer to clouds with a coverage of BKN or OVC.*~~

~~[1]Refer to Table AOP II-1, Explanation of the table~~

DRAFT

Proposal for Amendment of Asia and Pacific Regions Air Navigation Plan Volume II, Facilities and Services Implementation Document

(Serial No.: APAC 15/xx – MET)

a) **Plan :** ASIA/PAC ANP Volume II, FASID Doc 9673

b) **Proposed amendment:** Part VI METEOROLOGY (MET), **FASID Table MET 1A**:

As indicated in **Appendix 1** to this document:

Under Australia, **REPLACE** "TOWNSVILLE/ TOWNSVILLE INTL", "YBTL" with "CAIRNS/CAIRNS INTL", "YBCS" as the responsible MET office for service to be provided at CAIRNS/CAIRNS INTL, YBCS;

Under Australia, in column 6, **REPLACE** "Y" with "N" to indicate that trend forecast is not required for aerodrome ROCKHAMPTON, YBRK; and

Under Solomon Islands, **REPLACE** "PORT MORESBY INTL", "AYPY" with "HONIARA (HENDERSON)", "AGGH" as the responsible MET office for service to be provided at HONIARA (HENDERSON), AGGH

Part VI METEOROLOGY (MET), **FASID Table MET 1B**:

As indicated in **Appendix 2** to this document:

Under Australia, **DELETE** requirement for MWO at Cairns YBCS;

Under Nauru, **DELETE** the remark in column 5 indicating an arrangement is made for issuance of SIGMET by Port Moresby MWO; and

Under Solomon Islands, **DELETE** the remark in column 5 next to MWO Honiara indicating non- implementation of the MWO and that SIGMET is issued by Port Moresby

Part VI METEOROLOGY (MET), **FASID Table MET 3A**:

As indicated in **Appendix 3** to this document:

Under TCAC Darwin (Australia), Area of Responsibility, amend the southern boundary to follow latitude forty degrees south from the western to eastern boundaries as

indicated below:

South-East Indian Ocean
and
South-West Pacific Ocean
N: 0°S S: 40°S
W: 90°E E: 160°E

Under TCAC Darwin (Australia) and TCAC Nadi (Fiji), **DELETE** requirement for MWO at Cairns YBCS in columns 5 and 6;

Under TCAC Darwin (Australia) and TCAC Nadi (Fiji), **DELETE** the superscript "4)" next to MWO Honiara referencing the footnote indicating non- implementation of the MWO and that SIGMET is issued by Port Moresby; and

Under the Table, in Notes, at 4), **DELETE** the remark indicating an arrangement is made for issuance of SIGMET by Port Moresby MWO

Part VI METEOROLOGY (MET), **FASID Table MET 3B**:

As indicated in **Appendix 4** to this document:

Under VAAC Darwin (Australia), **DELETE** requirement for information to be sent to MWO at Cairns YBCS and **REALIGN** reference to ACC/FIC Townsville (in columns 6 and 7) with MWO Brisbane YBRF;

Under VAAC Darwin (Australia) and VAAC Wellington (New Zealand), **DELETE** the superscript "1)" next to MWO Honiara referencing the footnote indicating non-implementation of the MWO and that SIGMET is issued by Port Moresby;

Under VAAC Anchorage (United States), VAAC Tokyo (Japan), VAAC Toulouse and VAAC Washington (United States), **AMEND** the VAAC Area of Responsibility in column 3; and

Under the Table, in Notes, at 1), **DELETE** the remark indicating an arrangement is made for issuance of SIGMET by Port Moresby MWO

c) **Originated by:** Australia: with respect to changes related to Cairns YBCS, Townsville YBTL and Rockhampton YBRK and TCAC Darwin (ROBEX WG/13 [WP/17], MET SG/19 [WP/11] and MET SG/19 [Flimsy 07] refer)

Solomon Islands: with respect to changes related to Honiara

IAVWOPSG/8: with respect to changes to VAAC Area of Responsibility (Conclusion 8/2 refers)

MET SG/19: with respect to changes related to Nauru

d) **Originator's reasons for amendment:**

To reflect the current requirements with respect to the provisions for Meteorological Offices in Australia, the Solomon Islands and Nauru.

To align the southern boundary of the area of responsibility of TCAC Darwin with the areas of responsibility of the adjacent TCACs (Reunion and Nadi).

To ensure the areas of responsibility for volcanic ash advisory centres (VAACs), as depicted in column 3 of the ASIA/PAC FASID Table MET 3B, reflect the current requirements for VAAC areas of responsibility and are fully aligned with other (ICAO) regional air navigation plans.

e) **Intended date of implementation :**

Date of approval

f) **Proposal circulated to the following Sates and International Organizations:**

Afghanistan
Australia
Bangladesh
Bhutan
Brunei Darussalam
Cambodia
China
cc: Hong Kong, China
Macao, China
Cook Islands
Democratic People's Republic of Korea
Fiji
India
Indonesia
Japan
Kiribati
Lao PDR
Malaysia
Maldives
Marshall Islands
Micronesia
Mongolia
Myanmar
Nauru
Nepal
New Zealand
Pakistan
Palau
Papua New Guinea
Philippines
Republic of Korea
Samoa
Singapore
Solomon Islands
Sri Lanka
Thailand
Timor-Leste
Tonga
Vanuatu
Viet Nam

International Organizations
IATA
IFALPA
WMO

g) **Secretariat comments:**

i) The Secretariat is in favour of the amendment as proposed above in order to more accurately reflect the current

requirements with respect to requirements for Meteorological Offices in Australia and the Solomon Islands and VAAC Area of Responsibility.

ii) Editorial note: Amendments are arranged to show "deleted word/text" using strikeout (~~text to be deleted~~), and "added word/text" with yellow highlight (text to be inserted or to replace the existing text).

APPENDIX 1

International Civil Aviation Organization

FASID TABLE MET 1A

METEOROLOGICAL SERVICE REQUIRED AT AERODROMES

EXPLANATION OF

THE TABLE

Column

1 Name of the aerodrome or location where meteorological service is required

Note: The name is extracted from the *ICAO Location Indicators (Doc 7910)* updated quarterly. If a state wishes to change the name appearing in Doc 7910 and this table, ICAO should be notified officially.

2 ICAO location indicator of the aerodrome

3 Designation of aerodrome:

RG - international general aviation, regular use
RS - international scheduled air transport, regular use RNS - international non-scheduled air transport, regular use AS - international scheduled air transport, alternate use
ANS - international non-scheduled air transport, alternate use

4 Name of the meteorological office responsible for the provision of trend and aerodrome forecasts in TAF code at the aerodrome indicated in column 1

Note: A secondary meteorological office may be included if the primary meteorological office is closed part of the 24-hour period or a specific day of the week. Offices responsible under exceptional (e.g. back-up) conditions should not be listed.

5 ICAO location indicator of the responsible meteorological office

6 Requirement for trend forecasts

Y - Required

7 Requirement for aerodrome forecasts in TAF code

C - Requirement for 9-hour validity aerodrome forecasts in TAF code (9H)
T - Requirement for 18/24-hour validity aerodrome forecasts in TAF code (18/24H) X - Requirement for 30-hour validity aerodrome forecasts in TAF code (30H)

8 Availability of OPMET information (METAR/SPECI and TAF)

F - Full : OPMET data as listed issued for the aerodrome all through the 24-hour period
P - Partial : OPMET data as listed not issued for the aerodrome for the entire 24-hour period
N - None : No OPMET data issued for the time being

MET 1A - ASIAPAC

Aerodrome where service is to be provided			Responsible MET Office		Forecasts to be provided		
Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	TR	TAF	Availability of OPMET
1	2	3	4	5	6	7	8
....							
Australia							
ADELAIDE/ADELAIDE INTL	YPAD	RS	ADELAIDE/ADELAIDE INTL	YPAD	Y	X	F
ALICE SPRINGS	YBAS	AS	DARWIN/DARWIN INTL	YPDN		T	F
BRISBANE/BRISBANE INTL	YBBN	RS	BRISBANE/BRISBANE INTL	YBBN	Y	X	F
CAIRNS/CAIRNS INTL	YBCS	RS	~~TOWNSVILLE/TOWNSVILLE~~ CAIRNS/CAIRNS INTL	~~YBTL~~ YBCS	Y	T	F
CHRISTMAS ISLAND	YPXM	RS	PERTH/PERTH INTL	YPPH		T	F
COCOS (KEELING) ISLANS	YPCC	RS	PERTH/PERTH INTL	YPPH		T	F
DARWIN/DARWIN INTL	YPDN	RS	DARWIN/DARWIN INTL	YPDN	Y	X	F
HOBART	YMHB	RS	HOBART	YMHB		T	F
MELBOURNE/MELBOURNE	YMML	RS	MELBOURNE/MELBOURNE	YMML	Y	X	F
NORFOLK ISLAND	YSNF	RS	SYDNEY/SYDNEY (KINGSFORD SMITH) INTL	YSSY		T	F
PERTH/PERTH INTL	YPPH	RS	PERTH/PERTH INTL	YPPH	Y	X	F
PORT HEDLAND	YPPD	RS	PERTH/PERTH INTL	YPPH		T	F
ROCKHAMPTON	YBRK	AS	BRISBANE/BRISBANE INTL	YBBN	~~Y~~N	T	F
SYDNEY/SYDNEY (KINGSFORD SMITH)	YSSY	RS	SYDNEY/SYDNEY (KINGSFORD SMITH) INTL	YSSY	Y	X	F
TINDAL	YPTN	AS	DARWIN/DARWIN INTL	YPDN	Y	T	F
TOWNSVILLE/TOWNSVILL	YBTL	RS	TOWNSVILLE/TOWNSVILLE	YBTL	Y	T	F
....							
Solomon Islands							
HONIARA (HENDERSON)	AGGH	RS	~~PORT MORESBY INTL~~ HONIARA (HENDERSON)	~~AYPY~~ AGGH	Y	T	F
....							

APPENDIX 2

MWO Location	ICAO loc. ind.	Area served		Remarks
		Name	ICAO loc. ind.	
1	2	3	4	5
....				
AUSTRALIA				
ADELAIDE (REGIONAL FORECASTING CENTRE)	YPRM	Melbourne FIR [1]	YMMM	MWOs have areas of responsibility (AOR) defined by specific forecast area boundaries. These boundaries are not aligned with FIR boundaries MWO Darwin is designated to issue VA SIGMET for the whole Brisbane and Melbourne FIR
BRISBANE (REGIONAL FORECASTING CENTRE)	YBRF	Brisbane FIR [2]	YBBB	
~~CAIRNS~~	~~YBCS~~	~~Brisbane FIR [13]~~	~~YBBB~~	
DARWIN (REGIONAL FORECASTING CENTRE)	YPDM	Brisbane FIR [4] Melbourne FIR [5]	YBBB YMMM	
....				
NAURU				
NAURU I.	ANYN	Nauru FIR and SRR	ANAU	MWO not implemented~~, however, arrangement made for issuance of SIGMET by Port Moresby MWO~~
....				
SOLOMON ISLANDS				
HONIARA (HENDERSON)	AGGH	Honiara FIR and SRR	AGGG	~~MWO not implemented, however, arrangement made for issuance of SIGMET by Port Moresby MWO~~
....				

1) limited by the coordinates: 27S/128E;27S/135E;26S/138E; 2806S/14012E;29S/142E; 3414S/14205E;3345S/14045E; 40S/14045E;45S/14045E; 45S/129E;33S/129E;30S/129E; 2715S/12830E.

2) outside the AOR of YBTL MWO and limited by the coordinates: 0937S/14102E;0916S/14203E; 0913S/14206E;0911S/14214E; 0914S/14217E;0922S/14230E; 0922S/14230E;0923S/14236E; 0919S/14248E;0908S/14352E; 0924S/14414E;0957S/14405E; 1130S/14402E;1144S/14404E; 12S/144E;12S/155E;14S/155E; 14S/16115E;1740S/163E; 2830S/163E;2830S/155E; 2850S/15316E;29S/150E; 29S/14330E;26S/138E; 14S/138E;0937S/14102E.

3) limited by the coordinates: 26S/138E;29S/143E;29S/142E; 2806S/14012E;26S/138E.

4) limited by the coordinates: 1055S/12447E;0920S/12650E; 07S/135E;0950S/13940E; 0950S/141E;14S/138E; 18S/138E;2215S/138E; 26S/138E;2218S/13638E; 2128S/13609E;2111S/13134E; 2151S/13058E;2313S/12828E; 2322S/12629E;2327S/12415E; 2250S/12330E;2030S/12330E; 20S/129E;16S/12915E; 1528S/12806E;1450S/12825E; 14S/12730E;1345S/12609E; 14S/124E;1055S/12447E.

5) limited by the coordinates: 2250S/12330E;2327S/12415E; 2322S/12629E;2313S/12828E; 2151S/13058E;2111S/13134E; 2128S/13609E;2218S/13638E; 26S/138E;27S/135E; 2715S/12830E;25S/12815E; 25S/12330E;2250S/12330E.

6) limited by the coordinates: 40S/14045E;40S/143E; 3953S/14353E;4006S/14759E; 40S/150E;45S/150E; 45S/14045E;40S/14045E.

7) limited by the coordinates: 3730S/15033E;3730S/163E; 45S/163E;45S/150E; 4434S/150E;4351S/15040E; 43S/151E;3811S/15019E; 3730S/15033E.

8) limited by the coordinates: 3345S/14045E;3414S/14205E; 3510S/14728E;3730S/150E; 3730S/15033E;3811S/15019E; 43S/151E;4351S/15040E; 4434S/150E;40S/150E; 4006S/14759E;3953S/14353E; 40S/143E;40S/14045E; 3811S/14045E;3345S/14045E.

9) limited by the coordinates: 2311S/12831E; 2313S/12827E; 2321S/12631E; 2326S/12414E; 2133S/12226E; 2015S/12113E; 1858S/1203E; 1752S/11821E; 148S/1158E; 12S/11430E; 12S/12319E; 12S/12320E; 1055S/12446E; 140S/1240E; 1345S/1268E; 140S/12730E; 1449S/12825E; 1528S/1286E; 16S/12915E; 20S/1290E;

10) limited by the coordinates:. 12S/11430E; 148S/1158E; 1752S/11821E; 1858S/1203E; 2015S/12113E; 2133S/12226E; 2326S/12414E; 2321S/12631E; 2313S/12827E; 2311S/12831E; 25S/12815E; 2715S/12830E; 30S/1290E; 50S/1290E; 50S/75E; 60S/75E; 20S/78E; 20S/92E; 12S/107E;

11) limited by the coordinates: 29S/14632E;29S/150E; 2850S/15328E;2830S/155E; 2830S/163E;3730S/163E; 3730S/15033E 3657S/15045E; then east of the minor arc of a circle of 120NM radius centred on 3457S/15032E; 3519S/15256E;3421S/15140E; 3359S/15201E;3351S/15154E; 3328S/15148E;3315S/15126E; 3312S/15114E;3320S/15042E; 3327S/15033E;3206S/14850E; 29S/14632E.

12) limited by the coordinates: 29S/142E;29S/14330E; 29S/14632E;3206S/14850E; 3327S/15033E;3320S/15042E; 3312S/15114E;3315S/15126E; 3328S/15148E;3351S/15154E; 3359S/15201E;3421S/15140E; 3519S/15256E; then east of the minor arc of a circle of 120NM radius centred on 3457S 15032E; 3657S/15045E;3730S/15033E; 3730S/150;3510S/14728E; 3414S/14205E;29S/142E.

13) limited by the coordinates: 14S/138E;10S/141E;09S/142E; 09S/144E;13S/145E;15S/147E; 1817S/148E;2309S/15252E; 2334S/14811E;1818S/14332E; 18S/138E;14S/138E.

APPENDIX 3

TROPICAL CYCLONE ADVISORY CENTRE	ICAO LOC. IND.	AREA OF RESPONSIBILITY	PERIOD OF OPERATION[2]	MWO TO WHICH ADVISORY INFORMATION IS TO BE SENT	
				Name	ICAO LOC. IND.
1	2	3	4	5	6
Darwin (Australia)	YPDM	South-East Indian Ocean ~~N: 0°S S: 36°S~~ ~~W: 90°E E: 141°E~~ and South-West Pacific Ocean N: 0°S S: 40°S W: ~~141~~90°E E: 160°E	November – April	Adelaide[3] Brisbane Colombo Darwin Hobart[3] Honiara[4] Jakarta Melbourne[3] Perth Port Moresby Sydney[3] ~~Cairns[3]~~ Ujung Pandang Melbourne (World Met Centre, BoM)[3]	YPRM YBRF VOMM YDRM YMHF AGGH WIII YMRF YPRF AYPY YSRF ~~YBCS~~ WAAA YMMC
….					
Nadi (Fiji)	NFFN	Southern Pacific: N: 0°S S: 40°S W: 160°E E: 120°W	November – April	Brisbane ~~Cairns[3]~~ Hobart[3] Honiara[4] Honolulu Melbourne[3] Melbourne (World Met Centre, BoM)[3] Nadi Nauru[4] Sydney[3] Tahiti Wellington (Aviation Weather Centre)	YBRF ~~YBCS~~ YMHF AGGH PHFO YMRF YMMC NFFN ANYN YSRF NTAA NZKL
….					

NOTES:

1) Co-ordinates of the area of responsibility of the Nadi Tropical Cyclone Advisory Centre to be confirmed.
2) Indicates approximately the main seasons for tropical cyclones.
3) Tropical cyclone SIGMET for the Australian FIRs is issued by MWOs: Brisbane, Darwin and Perth.
4) MWO not implemented~~, however, arrangement made for issuance of SIGMET by Port Moresby MWO~~
5) MWO not implemented, however, arrangement made for issuance of SIGMET by Chengdu MWO

APPENDIX 4

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
Anchorage (United States)	PAWU	Anchorage Oceanic, Anchorage Continental, Oakland Oceanic north of N4300 E16500, N4812 W15000, N4812 W12800 Anchorage Arctic, and West to E15000, North of N6000	China	APAC	Haikou/Meilan	ZJHK	Sanya	ZJSA
			Russian Federation	EUR	*Anadyr*	*UHMA*	*Anadyr Shmidta Cape*	*UHMA UHMI*
					Magadan	*UHMM*	*Magadan*	*UHMM*
					Tiksi	*UEST*	*Tiksi*	*UEST*
					Zyryanka	*UESU*	*Zyryanka*	*UESU*
			USA	NAM	*Anchorage*	*PAWU*	*Anchorage*	*PAZA*
					Kansas City	*KKCI*	*Kansas City*	*KKCI*
Darwin (Australia)	YPDM	Southward from N2000 and from E08200 to E10000, and Southward from N1000 and from E10000 to E16000, and the Colombo, Melbourne and Brisbane FIRs	Australia	APAC	Adelaide [3)]	YPRM	Adelaide	YPAD
			Thailand	APAC	Bangkok	VTBS	Bangkok	VTBB
			Australia	APAC	Brisbane [3)]	YBRF	Brisbane Cairns Townsville	YBBN YBCS YBTL
			~~Australia~~	~~APAC~~	~~Cairns [3)]~~	~~YBCS~~	~~Townsville~~	~~YBTL~~
			India	APAC	Chennai	VOMM	Chennai	VOMF
			Sri Lanka	APAC	Colombo	VCBI	Colombo	VCBI
			Australia	APAC	Darwin	YDRM	Darwin	YPDN
			Viet Nam	APAC	Gia Lam	VVGL	Hanoi Ho-Chi-Minh	VVNB VVTS
			Australia	APAC	Hobart [3)]	YMHF	Hobart	YMHB
			Solomon I.	APAC	Honiara [1)]	AGGH	Honiara	AGGH
			Indonesia	APAC	Jakarta	WIII	Jakarta	WIIF
			Malaysia	APAC	Kuala Lumpur	WMKK	Kota Kinabalu Kuala Lumpur	WBFC WMFC
			Philippines	APAC	Manila	RPLL	Manila	RPHI
			Australia	APAC	Melbourne (World Met Centre, BoM)	YMMC	Melbourne	YMMM
			Australia	APAC	Melbourne [3)]	YMRF	Melbourne	YMMM
			Australia	APAC	Perth [3)]	YPRF	Perth	YPPH
			Papua New Guinea	APAC	Port Moresby	AYPY	Port Moresby	AYPM
			Singapore	APAC	Singapore	WSSS	Singapore	WSJC
			Australia	APAC	Sydney [3)]	YSRF	Sydney	YSSY
			Indonesia	APAC	Ujung Pandang	WAAA	Ujung Pandang	WAAF
			Myanmar	APAC	Yangon	VYYY	Yangon	VYYY
Tokyo (Japan)	RJTD	N6000 to N1000 and from E09000 to Oakland Oceanic and Anchorage	Russian Federation	EUR	*Artiom (Vladivostok)*	*UHWW*	*Vladivostok*	*UHWW*
			Thailand	APAC	Bangkok	VTBS	Bangkok	VTBB
			Russian Federation	EUR	*Blagoveshchensk*	*UHBB*	*Blagoveshchensk*	*UHBB*

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
		Oceanic and Continental FIR boundaries ~~minus the region bounded by N1000, N2000, E09000 and E10000~~ except the area within N2000 E09000 to N2000 E10000 to N1000 E10000 to N1000 E09000	China	APAC	Beijing	ZBAA	Beijing Huhhot Taiyuan	ZBPE ZBHH ZBYN
			Russian Federation	EUR	*Chita*	*UIAA*	*Chita*	*UIAA*
			Russian Federation	EUR	*Chulman (Nerungri)*	*UELL*	*Chulman*	*UELL*
			Viet Nam	APAC	Gia Lam	VVGL	Hanoi Ho-Chi-Minh	VVNB VVTS
			China	APAC	Guangzhou	ZGGG	Guangzhou Changsha Guilin Nanning	ZGZU ZGCS ZGKL ZGNN
			China	APAC	HAIKOU/Meilan	ZJHK	Sanya	ZJSA
			China	APAC	Hong Kong	VHHH	Hong Kong	VHHK
			Republic of Korea	APAC	Incheon	RKSI	Incheon	RKRR
			Russian Federation	EUR	*Irkutsk*	*UIII*	*Irkutsk*	*UIII*
			Russian Federation	EUR	*Khabarovsk*	*UHHH*	*Khabarovsk*	*UHHH*
			China	APAC	Chengdu	ZUUU	Kunming Chengdu Chongqing	ZPKM ZUDS ZUCK
			China	APAC	Xi'an	ZLXY	Lanzhou Xi'an	ZLAN ZLHW ZLSN
			Russian Federation	EUR	*Magadan*	*UHMM*	*Magadan*	*UHMM*
			Philippines	APAC	Manila	RPLL	Manila	RPHI
			Cambodia	APAC	Phnom Penh[2)]	VDPP	Phnom-Penh	VDPP
			DPR Korea	APAC	Sunan	ZKPY	Pyongyang	ZKKP
			China	APAC	Shanghai	ZSSS	Shanghai Hefei Jinan Nanchang Nanjing Xiamen Qingdao	ZSHA ZSOF ZSTN ZSCN ZSNJ ZSAM ZSQD
			China	APAC	Shenyang	ZYTX	Shenyang Dalian Hailar Harbin	ZYSH ZYTL ZBLA ZYHB
			China	APAC	Taibei	RCTP	Taibei	RCAA
			Japan	APAC	Tokyo	RJTD	Sapporo Tokyo Fukuoka Naha	RJCG RJTG RJDG RORG
			Mongolia	APAC	Ulaanbaatar	ZMUB	Ulaanbaatar	ZMUB
			China	APAC	Urumqi	ZWWW	Urumqi	ZWWW ZWUQ

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
			Lao PDR	APAC	Vientiane	VLVT	Vientiane	VLVT
			China	APAC	Wuhan	ZHHH	Wuhan	ZHWH
			Russian Federation	EUR	*Yelizovo (Petropavlovsk-Kamchatsky)*	*UHPP*	*Petropavlovsk-Kamchatsky*	*UHPP*
			Russian Federation	EUR	*Yuzhno-Sakhalinsk*	*UHSS*	*Yuzhno-Sakhalinsk*	*UHSS*
Toulouse (France)	LFPW	Santa Maria Oceanic FIR, AFI Region ~~north of S6000~~ down to the South Pole, EUR Region (except for Finland, Kobenhavn, London, Norway, Scottish~~,~~ ~~and~~ Shannon and Sweden FIRs) west of E09000 and south of N7100, MID Region, and ASIA Region~~,~~ west of E09000 north of N2000 (plus Mumbai, Chennai (west of E08200) and Male FIRs)	India	APAC	Chennai	VOMM	Chennai FIR and SRR	VOMF
			India	APAC	Delhi/Indira Ghandi Intl	VIDP	Delhi FIR and SRR	VIDF
			Afghanistan	APAC	Kabul AD	OAKM	Kabul FIR and SRR	OAKX
			Pakistan	APAC	Karachi/ Jinnah Int'l	OPKC	Karachi FIR and SRR	OPKR
			Nepal	APAC	Kathmandu	VNKT	Kathmandu FIR and SRR	VNSM
			India	APAC	Kolkata	VECC	Kolkata FIR and SRR	VECF
			Pakistan	APAC	Lahore/Allama Iqbal Int'l	OPLA	Lahore FIR and SRR	OPLR
			Maldives	APAC	Male/Intl	VRMM	Male FIR and SRR	VRMM
			India	APAC	Mumbai/ Chhatrapati Shivaji Intl.	VABB	Mumbai FIR and SRR	VABF
			China	APAC	Urumqi/Diwopu	ZWWW	Urumqi FIR and SSR	ZMUQ
			Bangladesh	APAC	Hazrat Shahjalal International Airport	VGHS	Dhaka FIR and SRR	VGFR
Washington (United States)	KNES	~~New York Oceanic, Oakland Oceanic FIR~~	USA	NAM	Honolulu *Kansas City*	PHFO *KKCI*	*Oakland Oceanic*	*KZAK*
							Guam	PGZU

VAAC		AREA OF RESPONSIBILITY	STATE	ICAO REGION	MWO TO WHICH INFORMATION IS TO BE SENT		ACC/FIC TO WHICH INFORMATION IS TO BE SENT	
NAME	ICAO LOC. IND.				Name	ICAO LOC. IND.	Name	ICAO LOC. IND.
1	2	3	4	5	6	7	8	9
		~~south of N4300 E16500,N4812 W15000, N4812 W12800 and United States continental FIRs north of S1000 W14000~~ New York Oceanic Oakland Oceanic south of N4300 E16500 to N4820 W15000 to N4820 W12800, United States Continental FIRs, New York Oceanic FIR North of S1000 W14000 East of 0000 W14000 and North of S10000 W14000 to S1000 W03000 Nadi and Nauri FIRs North of Equator	Fiji	APAC	Nadi	NFFF	Nadi	NFFF
Wellington (New Zealand)	NZKL	Southward from the Equator and from E16000 to W14000, except for the Melbourne and Brisbane FIRs, and Southward from S1000 and from W14000 to W09000	Australia	APAC	Brisbane [3)]	YBRF	Brisbane	YBBN
			Australia	APAC	Darwin	YDRM	Darwin	YPDN
			USA	APAC	Honolulu	PHFO	*Oakland Oceanic*	*KZAK*
			Solomon I.	APAC	Honiara~~1)~~	AGGH	Honiara	AGGH
			Australia	APAC	Melbourne [3)]	YMRF	Melbourne	YMMM
			Fiji	APAC	Nadi	NFFN	Nadi	NFFF
			Nauru	APAC	Nauru[1)]	ANYN	Nauru	ANAU
			Australia	APAC	Sydney [3)]	YSRF	Sydney	YSSY
			French Polynesia	APAC	Tahiti	NTAA	Tahiti	NTTT
			New Zealand	APAC	Wellington (Aviation Weather Centre)	NZKL	Auckland Christchurch	NZZO NZZC

Notes: – 1) MWO not implemented~~, however, arrangement made for issuance of SIGMET by Port Moresby MWO.~~

2) MWO not implemented, however, arrangement made for issuance of SIGMET by Chengdu MWO.

3) MWO Darwin is designated to issue VA SIGMET for Brisbane and Melbourne FIRs.

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DRAFT ANRF (ASBU B0-AMET)

1. AIR NAVIGATION REPORT FORM (ANRF)

APAC Regional planning for ASBU Modules

2. REGIONAL PERFORMANCE OBJECTIVE – ASBU B0-AMET: Meteorological Information Supporting Enhanced Operational Efficiency and Safety **Performance Improvement Area 2: Globally Interoperable Systems and Data - Through Globally Interoperable System Wide Information Management**

3. ASBU B0-AMET: Impact on Main Key Performance Areas					
	Access & Equity	**Capacity**	**Efficiency**	**Environment**	**Safety**
Applicable	N	Y	Y	Y	Y

4. ASBU B0-AMET: Planning Targets and Implementation Progress	
5. Elements	**6. Targets and implementation progress (Ground and Air)**
1. World Area Forecast System (WAFS)	Reception of WAFS information and making this available to users to support flight planning, dynamic and flexible management of airspace, improved situational awareness, collaborative decision making and flight trajectory planning.
2. Volcanic Ash Advisory Centre (VAAC)	Implementation of VAACs to support International Airways Volcano Watch (IAVW). Agreements in place between Volcano Observatories and VAACs.
3. Tropical Cyclone Advisory Centre (TCAC)	Implementation of TCACs to support tropical cyclone watch.
4. Aerodrome warnings, including wind shear warnings and alerts	Identification of aerodromes that require Aerodrome Warnings, including wind shear warnings and alerts.
5. SIGMET	Implementation of SIGMET for all Flight Information Regions (FIR) within the APAC region.
6. Other OPMET (ie.METAR/SPECI and TAF)	Provision of OPMET data as per the requirements in the Regional Air Navigation Plan.
7. Quality Management System	Implementation of Quality Management Systems at aviation meteorological services in accordance with ICAO and World Meteorological Organization (WMO) provisions.
8. Qualifications and Competencies	Implementation of systems along with an ongoing competency assessment and training program to ensure qualifications and competencies of aviation meteorological personnel in accordance with ICAO and WMO provisions.

7. ASBU B0-AMET: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
1. WAFS	WAFS data reception system, via public internet distribution systems	Nil	Operations manuals. Contingency plans.	N/A

7. ASBU B0-AMET: Implementation Challenges				
Elements	**Implementation Area**			
	Ground System Implementation	**Avionics Implementation**	**Procedures Availability**	**Operational Approvals**
2. VAAC	AFTN/AMHS AFS	Nil	Operations manuals. Contingency plans.	N/A
3. TCAC	AFTN/AMHS AFS	Nil	Operations manuals. Contingency plans.	N/A
4. Aerodrome warnings, including wind shear warnings and alerts	AFTN/AMHS AFS ATIS Local networks	Nil	Operations manuals. Contingency plans.	N/A
5. SIGMET	AFTN/AMHS AFS	Nil	Operations manuals. Contingency plans.	N/A
6. Other OPMET	AFTN/AMHS AFS	Nil	Operations manuals. Contingency plans.	N/A
7. Quality Management	Nil	Nil	Quality Manual.	N/A
8. Qualifications and Competencies	Nil	Nil	Training program plans.	N/A

8. ASBU B0-AMET Performance Monitoring and Measurement 8A. ASBU B0-AMET: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
1. WAFS	Indicator: Percentage of States receiving WAFS via Secure SADIS FTP and WIFS and making this available to users. Supporting metric: Number of States receiving WAFS via Secure SADIS FTP and WIFS and making this available to users.
2. VAAC	Indicator: Percentage of designated VAACs implemented to provide volcanic ash advice to Meteorological Watch Offices (MWO). Percentage of designated volcano observatories implemented and procedures in place to send observations to relevant VAACs and MWOs. Supporting metric: Number of VAACs implemented to provide volcanic ash advice. Number of volcano observatories implemented.
3. TCAC	Indicator: Percentage of designated TCACs implemented to provide tropical cyclone advice to MWO. Supporting metric: Number of TCACs implemented to provide tropical cyclone advice.
4. Aerodrome warnings, including wind shear warnings and alerts	Indicator: Percentage of required aerodromes providing Aerodrome Warnings, including wind shear warnings and alerts. Supporting metric: Number of required aerodromes providing Aerodrome Warnings, including wind shear warnings and alerts.

8. ASBU B0-AMET Performance Monitoring and Measurement 8A. ASBU B0-AMET: Implementation Monitoring	
Elements	**Performance Indicators/Supporting Metrics**
5. SIGMET	Indicator: Percentage of States/MWOs providing SIGMET for associated FIR. Supporting metric: Percentage of States/MWOs providing SIGMET for associated FIR.
6. Other OPMET	Indicator: Percentage of availability, reliability and compliance of METAR/SPECI and TAF in accordance with APAC requirements for AOP and non-AOP aerodromes.. Supporting metric: Number of METAR/SPECI and TAF issued in accordance with APAC requirements for AOP and non-AOP aerodromes.
7. Quality Management	Indicator: Percentage of meteorological service providers with a Quality Management System implemented. Supporting metric: Number of meteorological service providers with a Quality Management System implemented.
8. Qualifications and Competencies	Indicator: Percentage of aviation meteorological personnel with the required qualifications. Percentage of meteorological service providers with a competency assessment and training program implemented. Supporting metric: Number of aviation meteorological personnel with the required qualifications. Number of meteorological service providers with a competency assessment and training program implemented.

8. ASBU B0-AMET. Performance Monitoring and Measurement 8B. ASBU B0-AMET: Performance Monitoring	
Key Performance Areas	**Metrics (if not indicate qualitative Benefits)**
Access & Equity	Not applicable
Capacity	Optimized usage of airspace and aerodrome capacity due to MET support
Efficiency	Reduced arrival/departure holding time, thus reduced fuel burn due to MET support
Environment	Reduced emissions due to reduced fuel burn due to MET support
Safety	Reduced incidents/accidents in-flight and at aerodromes due to MET support.

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Meteorological observations and reports. (Annex 3, Chapter 4)	Solomon Islands AP-MET-01	Weather information is inadequate and not provided on a regular basis	1996 Confirmed 2006 SOA	Reported by airlines operating to Solomon I.	Equipment to be upgraded and arrangements to be made for regular observations. TC expert recommendation to replace and/or calibrate MET obs. equipment AGGH – 2008. State made aware of MET Services gaps identified by ICAO TC Project, CAEMSA-SP, in late 2008. CAEMSA-SP Phase II plan for Donors and associated remedies. Activation of WIFS will assist in overcoming deficiency. AWS was installed (2012) at Honiara (Henderson), AGGH, by New Zealand, including training of Solomon Is. technical personnel in the maintenance of the equipment. Responsibility for ongoing system calibration and verification may need to be determined. Secure transmission of weather information to the appropriate RODB may need to be verified (noting that transmission via email to the Australian Bureau of Meteorology may not be appropriate). Solomon Is. expected to address issues concerning calibration and verification of meteorological observation systems and proper/secure transmission of information. Solomon Islands advised that with the assistance from the WMO and Australia (Bureau of Met), Solomon Islands is now ready to take back these responsibilities – then these deficiencies will be	Ministry of Transport, Works and Aviation, Solomon I. *Note: OPMET/M TF to carry out survey*	2011	A

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					addressed.			
Meteorological observations and reports. (Annex 3, Chapter 4)	Kiribati AP-MET-02	METAR from Kiribati not available on regular basis.	1998 Confirmed 2005 SIP	Reported by airlines	State's MET authority to consider urgent action to be taken for providing regular observations and reports. TC expert recommendation to purchase/install AWOS – 2008. ICAO SIP conducted in 2005. State made aware of MET Services gaps identified by ICAO TC Project CAEMSA-SP, in late 2008. CAEMSA-SP Phase II plan for Donors and associated remedies. Activation of WIFS will assist in overcoming deficiency. Kiribati requested assistance from New Zealand with respect to the supply of a new/replacement meteorological observing system. Kiribati was considering funding options for a new meteorological observing system and a full meteorological observing programme.	Directorate of Civil Aviation, Kiribati. *Note: OPMET/M TF to carry out survey*	2011	A
Reporting of information on volcanic eruptions to civil aviation units. (Annex 3, 3.6, 4.8)	Indonesia AP-MET-03	Information on volcanic activity not provided regularly to ATS units and MWOs.	1995 Confirmed by ICAO SIP mission Dec 2003	Observed by States concerned. Reported at the WMO/ICAO Workshop on Volcanic Ash Hazards (Darwin,	Three-party LOA to be signed between the MGA, DGCA and DVGHM. Information exchange between CVGHM & ABA in draft form. VSAT comms. installed to improve the monitoring in E Nusa Tenggara – provides direct transfer of	DGCA, MGA Indonesia	2014	A

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
				1995)	data to CVGHM HQ full time. (AusAID-funded project). Bilingual reporting form based on VONA to improve comm. to VAAC in Sulawesi. Indonesia submitted an official report to the RO (August 2014) on corrective action taken: (a) BMKG and DGCA signed a MoU to strengthen the dissemination of volcanic ash activity reports and to improve management of flight operations during volcanic eruptions; (b) CVGHM, NOTAM office–DGCA, MWOs and BMKG implemented a volcanic activity report dissemination system (1 May 2012) to ensure information on volcanic activity is provided regularly to ATS units and MWOs; and (c) Indonesia (BMKG, DGCA, and CVGHM) and VAAC (Darwin) held a coordination meeting (June 2014) to strengthen the coordination of volcanic ash information between Indonesia and VAAC. ICAO to validate the action taken and then inform APANPIRG on the status of the deficiency for possible removal from the Open List.			
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 and MWOs.	1995 Confirmed by ICAO SIP mission Dec 2003	Observed by States concerned. Reported at the WMO/ICAO Workshop on Volcanic Ash Hazards (Darwin, 1995)	Procedures to be set up for exchange of data between NWS, ATS and Rabaul Volcano Observatory (RVO) and a LOA to be signed Discussion of an agreement between RVO & PNG CAA to provide volcanic information to aviation through cost recovery is underway. Recent analysis of meteorological services provided	NWS, ATS PNG *Note: ICAO Regional Office to monitor*	TBD (no action plan submitted to RO)	A

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					in PNG (conducted by PNG, Australia and the ICAO) produced a number of recommendations for actions that would strengthen services and help rectify MET deficiencies. Future volcanic ash exercises in the APAC region would facilitate reporting of information on volcanic eruptions to civil aviation units in States concerned.			
Provision of SIGMET for volcanic ash (Annex 3, Chapter 7; ASIA/PAC FASID Table MET 1B)	Indonesia AP-MET-06 Philippines AP-MET-07 Papua New Guinea AP-MET-08	Requirements for issuance and proper dissemination of SIGMET, including SIGMET for volcanic ash, have not been fully implemented	ICAO SIP mission Dec 2003	a) Reported by airlines b) Noted by Volcanic Ash Advisory Centres	a) ICAO to carry out a Special Implementation Project (SIP) with the primary objective to improve implementation of SIGMET procedures, especially for VA. b) State to take urgent actions to implement the SIGMET procedures. Note. ICAO SIP carried out in 2003, progress in issuance of SIGMET for VA is noted; the outstanding problems to be resolved within 1-year (progress reported by VAAC Darwin) LOA between ATO, PHIVOCS & PAGASA signed in 2004 to make reporting part of information dissemination practice. LOA is undergoing periodic review (ref. letter of PAGASA dated March 12, 2008) VAAC Darwin trained forecasters in PNG and Philippines to prepare VA SIGMET Participated in VA SIGMET test 17 Nov 2009 SIGMET monitoring over a period of 2 months in August and September 2012 indicated that no SIGMET was received from PNG (MET SG/17,	a) State's Met authorities b) ICAO to implement the SIP. c) ICAO Regional Office to co-ordinate and monitor.	2014 (AP-MET-06), To be advised (AP-MET-07 and 08)	U

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					8.4.3 & 13.9 refers). Indonesia advised (MET SG/17) that procedures were developed for the issuance of SIGMET (WS, WV and WC) compliant with ICAO provisions and that MWO Jakarta (WIII) and MWO Ujung Pandang (WAAF) have issued SIGMET according to the requirements since April 2013. MET SG/17 noted that validation of SIGMET receipt at RODBs and WIFS/SADIS gateways would be necessary and may require additional SIGMET monitoring and participation in SIGMET tests. Indonesia submitted an official report to the RO (August 2014) on corrective action taken: (a) BMKG implemented national procedures for issuance of SIGMET (April 2013) at both MWOs (Jakarta/WIII and Ujung Pandang/WAAA); and (b) MWOs successfully participated in SIGMET tests. ICAO to validate the action taken and then inform APANPIRG on the status of the deficiency for possible removal from the Open List. PNG did not participate in 2013 SIGMET tests. A recent analysis of the meteorological services provided in PNG (conducted by PNG, Australia and the ICAO) produced a number of recommendations for actions that would strengthen services and help rectify MET deficiencies. Future volcanic ash exercises in the APAC region would facilitate provision of SIGMET for volcanic			

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					ash in States concerned.			
a) Service for operators and flight crew members. (Annex 3, Chapter 9). b) WAFS products for flight documentation. (ASIA/PAC FASID Table MET 1A).	Cambodia AP-MET-09	Briefing and flight documentation not provided as required. WAFS products not available	1999	Airlines do not receive the required flight documentation including WAFS forecasts.	States to consider urgent action for installation of SADIS VSAT for receiving WAFS products and OPMET information. Action plan proposed by ICAO MET mission 2003 A TC project proposal submitted to SSCA, Cambodia Cambodia expects to have SADIS FTP operational in 2011 and may require training from a nearby State Cambodia informed MET SG/17 that the Secure SADIS FTP system was installed but further action was required in relation to training of personnel to use the system. Specific training necessary for the personnel to provide the WAFS products for flight documentation was expected to be addressed by Cambodia.	State's MET authorities	End 2011	A
MWO for Phnom Penh FIR and SIGMET (Annex 3, Chapter 3 & 7; ASIA/PAC FASID Table MET 1B)	Cambodia AP-MET-11	Requirements for meteorological watch office (MWO) to be established at Phnom-Penh international airport have not been met.		MWO not established due to lack of trained personnel and technical facilities. No SIGMET service for Phnom Penh FIR	Establishment of MWO currently not feasible. SIGMET service is provided under bilateral agreement with China to meet requirements. A TC project proposal submitted to SSCA, Cambodia Cambodia is in process of establishing its own MWO with target date end of 2011. Bilateral arrangement with China has successfully addressed part of the deficiency (SIGMET	SSCA, Cambodia	TBD End 2011	A

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Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					issuance).			
Provision of SIGMET information (Annex 3, Chapter 7; ASIA/PAC FASID Table MET 1B)	Lao PDR AP-MET-12	Requirements for issuance and dissemination of SIGMET have not been fully implemented.	2000	SIGMET frequently not available Reported by airlines	State's MET authority to take urgent actions to implement the SIGMET procedures. Lao PDR has established MWO in 2010 and started issuing SIGMET since March 2011. As a result of monitoring by RODB Bangkok, LAO PDR was advised to correct noted formatting problem and to issue SIGMET on a regular basis to meet requirements. Lao PDR is expected to issue SIGMET regularly by the end of 2011. This deficiency can be considered for removal after correcting the above problems. SIGMET monitoring by RODB Bangkok in February 2012 failed to identify the issuance of any SIGMET by Lao PDR, indicating that the deficiency is still to be properly rectified (ROBEX WG/11, 2.1.4 refers). Lao PDR did not successfully participate in each of the three 2013 SIGMET tests. Lao PDR established a special MET Improvement Task Force to address deficiencies and is expected to report back to ICAO in due course on the status of implementation of corrective action.	State's MET authorities	End 2011	A
Provision of SIGMET information for Kathmandu FIR. (Annex 3, Chapter 7; ASIA/PAC FASID	Nepal AP-MET-14	Requirements for issuance and dissemination of SIGMET have not been met.	2000	Not established due to lack of technical facilities. No SIGMET service for Kathmandu FIR	Issuance of SIGMET currently not feasible. Action being taken to have SIGMET service provided under bilateral agreement with a neighbouring country to meet immediate	MET Authority Nepal	2014	A

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Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
Table MET 1B)					requirement. Nepal is also planning to issue its own SIGMET. Nepal informed the RO of progress: now able to issue SIGMET when necessary; training was conducted by WMO (Nov 2013); SIGMET issuance in operation (July 2013); SIGMET information transmitted to ATS units and other CA units concerned; participated in 2013 SIGMET tests. Nepal expected to submit in writing an official report to the RO providing details of the corrective action taken.			
MWO for Pyongyang FIR and SIGMET (Annex 3, Chapter 3 & 7; ASIA/PAC FASID Table MET 1B)	Democratic Peoples' Republic of Korea AP-MET-16	Requirements for meteorological watch office (MWO) to be established at Pyongyang international airport have not been met.	2008	MWO not established due to lack of trained personnel and lack of resources. No SIGMET service for Pyongyang FIR Reported by RO mission	MWO established in February 2009 as reported by State. DPRK is subsequently producing SIGMET on a regular basis and is routing SIGMET to RODB Tokyo. It is required for Sunan MWO to participate the APAC SIGMET test in November 2011. This deficiency can be removed if SIGMET is continued to be issued regularly for another six months. DPRK informed RO that SIGMET were issued in May 2013; RO to coordinate confirmation of receipt of SIGMETs at required offices. DPRK to submit official report to RO providing details of corrective action taken. Validation would necessarily require SIGMET monitoring to confirm receipt at required offices. Test SIGMETs were not	General Administration of Civil Aviation (GACA) DPRK	2014	A

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Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					received from DPRK in 2013; assistance to be coordinated by ROBEX WG to resolve the communication issues.			
Volcanic activity information to be provided to ATS units, MWOs, and VAAC (Annex 3, 3.6 and 4.8)	Tonga AP-MET-17	Information on volcanic activity not provided regularly to ATS units, MWOs, and VAAC	2008	Reported by TCB CAEMSA-SP technical expert	Agreement drafted for the dissemination of volcanic ash information from MLSNRKT to MTKT for distribution to ACCs, MWOs and VAACs (under consideration) Tonga submitted official report to RO (10 May 2013) advising that MOU between the Ministry of Infrastructure (MOI) and the Ministry of Lands, Environment, Climate Change and Natural Resources (MLECCNR) signed 9 May 2013 for coordination procedures of the dissemination of detection of volcanic ash information to the appropriate ACC, VAAC and MWO. ICAO to validate the action taken (with assistance from VAAC Wellington) and then inform APANPIRG on the status of the deficiency for possible removal from the Open List.	Ministry of Transport of the Kingdom of Tonga (MTKT) Ministry of Lands, Survey and Natural Resources of the Kingdom of Tonga (MLSNRKT)	2014	U
Briefing and flight documentation (Annex 3, Chapter 9, Appendix 2 & 8)	Kiribati AP-MET-18 Nauru AP-MET-19 Solomon Islands AP-MET-20	WAFS products not accessed and therefore not available for inclusion in flight briefings and documentation	2008	Reported by TCB CAEMSA-SP Technical Expert	WAFS Internet File Service (WIFS) allows for the retrieval of WAFS forecasts for flight briefings and documentation (versus more expensive satellite dish) – available for operations since May 2010 Will seek donor ship for installation and training on WIFS as part of CAEMSA-SP Phase II Solomon Islands advised that with the assistance from the WMO and Australia (Bureau of Met), Solomon Islands is now ready to take back these responsibilities – then these deficiencies will be	MET Services, TCB, Donor, ISCS Provider State	2012	U

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					addressed.			
Provision of meteorological observations (Annex 3, 4.3.1, 4.5, 4.6)	Nauru AP-MET-21	No METAR/SPECI observing programme in place (no calibrated and maintained equipment available)	2008	Reported by TCB CAEMSA-SP Technical Expert	Automatic observing station needed as well as maintenance programme Will seek donor for observing system and maintenance contract and/or training as part of CAEMSA-SP Phase II	MET Service, TCB, Donor	2012	U
Provision of SIGMET information (Annex 3, Chapter 7)	Papua New Guinea AP-MET-22 Solomon Islands AP-MET-23 Nauru AP-MET-24	Lack of SIGMET issued for the Port Moresby, Honiara, and Nauru FIRs.	9/09/2011	IATA emphasized the importance of having hazards reported in this large sub-regional area that straddles the equator and deemed this situation unsafe and unacceptable to airline operations.	ICAO: States concerned are urged to take urgent action to seek assistance from a State in a position to do so to provide the service until such time the States concerned can provide their own SIGMET. SIGMET monitoring over a period of 2 months in August and September 2012 indicated that no SIGMET was received (MET SG/17, 8.4.3 & 13.9 refers). Arrangement for issuance of SIGMET by PNG on behalf of Solomon Is. and Nauru has not been successful. APANPIRG/24 Conclusion 24/51 to further investigate and assess the feasibility of bilateral agreements for the provision of SIGMET. PNG did not participate in 2013 SIGMET tests. A recent analysis of the meteorological services provided in PNG (conducted by PNG, Australia and			U

REPORTING FORM ON AIR NAVIGATION DEFICIENCIES IN THE MET FIELD IN THE ASIA/PAC REGION (Updated by APANPIRG/25) (Additional updates from States since APANPIRG/25)								
Identification		**Deficiencies**			**Corrective action**			
Requirements	**States/ facilities**	**Description**	**Date first reported**	**Remarks**	**Description**	**Executing body**	**Target date for completion**	**Priority for action ***
					the ICAO) produced a number of recommendations for actions that would strengthen services and help rectify MET deficiencies. Future volcanic ash exercises in the APAC region would facilitate provision of SIGMET for volcanic ash in States concerned. Solomon Islands advised that with the assistance from the WMO and Australia (Bureau of Met), Solomon Islands is now ready to take back these responsibilities – then these deficiencies will be addressed.			

IWXXM AND AMHS SURVEY

This survey is intended to inform ICAO APANPIRG on the status of planning and implementation of the digital exchange of meteorological information (IWXXM) and Aeronautical Message Handling System (AMHS) links in APAC States necessary to conform to Annex 3 standards envisaged for applicability in November 2018.

Q1. Please provide the name of your State/Territory: . . . . . .

Q2. Please provide your contact details:

Name: . . . . . .

Organisation: . . . . . .

Email address: . . . . . .

Q3. Please confirm if your State is aware that ICAO has initiated work on the development of future standards in Annex 3 for the international exchange of XML-formatted OPMET, including SIGMET, TAF, METAR, SPECI & AIRMET, for potential applicability as early as November 2018?

a) Yes, we are aware
b) No, we weren't aware

Q4. Please indicate the status of planning and implementation of XML-formatted OPMET within your State:

a) Not yet started
b) Planning
c) Procuring a solution
d) Testing
e) Operational

Q5. If not yet operational, please indicate when operational status is expected (if known):

a) Yes, during 2015
b) Yes, during 2016
c) Yes, during 2017
d) Yes, during 2018
e) Not sure
f) Other (please specify) . . . . . .

Q6. Please indicate which entity will generate XML-formatted OPMET for your State (you may select more than one):

a) National Meteorological Service Provider
b) National Air Navigation Service Provider (ANSP)
c) National Regional OPMET Databank (RODB)
d) Not yet determined
g) Other, e.g., from another State (please specify) . . . . . .

Q7. Please indicate whether or not your State has access to an AMHS connection for sending IWXXM data internationally:

a) Yes, and it currently supports Extended AMHS
b) Yes, and it supports Extended AMHS although this is not configured
c) Yes, but it does not support Extended AMHS
d) No
e) Not sure

Q8. If you answered no to Q6 (i.e., d) not yet determined), please indicate whether or not your State has plans to implement AMHS:

h) Yes, during 2015
i) Yes, during 2016
j) Yes, during 2017
k) Yes, during 2018
l) No
m) Not sure
n) Other (please specify) . . . . . .

Q9. Please indicate whether or not your State is planning to convert XML-format OPMET messages to traditional alphanumeric code (TAC):

a) Yes, during 2015
b) Yes, during 2016
c) Yes, during 2017
d) Yes, during 2018
e) No
o) Other (please specify) . . . . . .

Comments:

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SURVEY OF STATE METEOROLOGICAL INFORMATION SUPPORTING AIR TRAFFIC MANAGEMENT

Please circle all relevant responses (there may be more than one per question).

Q1. Provide the specific meteorological products and/or websites that your administration (and/or State) has available to support Air Traffic Flow Management (ATFM):

a) Local Routine and Special Report (MET REPORT / SPECIAL)
b) Aerodrome Report (METAR / SPECI)
c) Volcanic Activity Report
d) Volcano Observatory Notice to Aviation (VONA)
e) Air Report and Special Air Report (ARP and ARS)
f) Aerodrome Forecast (TAF)
g) Trend Forecast (TREND)
h) Area Forecast (GAMET)
i) Significant Weather Forecast (SIGWX) Low (SFC-FL100)
j) Significant Weather Forecast (SIGWX) Medium (FL100-250)
k) Significant Weather Forecast (SIGWX) High (FL250-630)
l) Volcanic Ash Advisory (VAA)
m) Volcanic Ash Graphic (VAG)
n) Tropical Cyclone Advisory (TCA)
o) Tropical Cyclone Graphic (TCG)
p) SIGMET
q) AIRMET
r) Aerodrome Warning (AD WRNG)
s) Wind Shear Warning (WS WRNG)
t) Wind Shear Alert
u) Climatological Information
v) Tailored or other MET information (please specify) . . . . . .
w) Websites: . . . . . .

Q2. What are the methods you use to distribute meteorological information?

a) Aeronautical Fixed Telecommunications Network (AFTN)
b) Aeronautical Message Handling System (AMHS)
c) Telephone
d) Facsimile
e) Internet portal
f) Web/video conferencing
g) Other (please specify) . . . . . .

Q3. List the MET products your State considers operationally valuable (in order of the most importance) to ATFM (refer to list in Q1).

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Q4. Does your State use automated processing of gridded MET data in ATM automation and/or ATFM systems for the calculation of flight trajectories and flight plan updates?

a) No
b) Yes from the World Area Forecast System (WAFS)
c) Yes from another source (please specify) . . . . . .

Q5. If you answered YES to Q4, what gridded data is currently being used?

a) Wind
b) Temperature and humidity
c) Icing
d) Turbulence
e) Cumulonimbus cloud
f) Other (please specify) . . . . . .

Q6. If you answered NO to Q4, does your facility plan to implement ATM/AFTM automation system processes using gridded data, and if so by what date?

a) No
b) Yes (specify target implementation date) . . . . . .

Q7. What are your expectations of the MET service provider in the provision of MET services in support of ATFM?

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Q8. What efforts are you presently undertaking to improve MET service provision in support of ATFM in your State?

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Q9. Has your State enacted primary legislation and supporting regulations for the provision of MET services in accordance with the provisions in Annex 3 to the Convention on International Civil Aviation – *Meteorological Service for International Air Navigation* and applicable regional air navigation agreements?

a) No
b) Yes (please specify) . . . . . .

Q10. Does your State have regulations in place requiring that air traffic service authorities and meteorological authorities establish an agreement in accordance with the provisions in Annex 3 [4.2] and guidance in ICAO Doc. 9377 – *Manual on Coordination between Air Traffic Services, Aeronautical information Services and Aeronautical Meteorological Services* defining roles and responsibilities, and the MET information to be provided?

a) No
b) Yes (please specify) . . . . . .

ROBEX Handbook – list of updates – 2015

Section/page	Amendment	Notes/reasoning (Reference)
Par. 2.4.1	"… In order to achieve these tasks, the ROBEX implementation status and planning is part of the agenda of the CNS/MET and/or MET sub-groups of the two PIRGs".	Reflect current framework of sub groups under APANPIRG i.e., MET SG (ROBEX WG/13)
Par. 3.1.1	"…Note that IATA TAF requirements in the ASIA/PAC region are for TAF validity of either 24 or 30 hours. Some States issue 12- and 18-hour TAF which don't meet requirements, but are nevertheless classified as FT for the WMO data type designator. The ASIA/PAC Regional Air Navigation Plan does not include any requirement for 9-hour validity aerodrome forecasts in TAF code (9H) classified as FC for the WMO data type designator".	To clarify that there are no requirements for 9-hour TAF in ASIA/PAC (ROBEX WG/13)
Par. 3.3.2.2	"Inter-regional OPMET exchange via IROGs is carried out through the ground segment of the AFS (currently, through the AFTN or AMHS)".	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Par. 3.3.4.1	"Where OPMET exchanges described in the above paragraphs are not sufficient, direct AFTN or AMHS addressing should be utilized by the originating centres or NOCs"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Par. 4.1.2	"National OPMET center (NOC). Normally, a NOC is associated with the State's national AFTN centre/switch or AMHS. The …"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Page 8	In the diagram: Replace SADIS with SADIS / Secure SADIS FTP Replace ISCS with WIFS Under RODB Bangkok, replace IROG-MID with IROG-MID/AFI Under RODB Brisbane, add IROG-AFI Add connections to OPMET Centres FAPR and GOOY from RODB Bangkok and RODB Brisbane	Update nomenclature with respect to current distribution of OPMET information from SADIS and WIFS Provider States. Realign diagram with current inter-regional OPMET exchange between APAC and AFI Region.
Page 8	In the diagram: Remove the line connecting RODB Brisbane and RODB Tokyo In the key, add a red line indicating AFTN and blue line indicating AMHS Change the colour of the line connecting RODB Brisbane and RODB Nadi to blue	To reflect the current status of connections between RODBs (ROBEX WG/13)

Section/page	Amendment	Notes/reasoning (Reference)
Page 9	Replace outdated Chart CNS 1 with text "AFTN plan to be inserted here"	Chart CNS 1 to be addressed by e-ANP CNS Development Working Group (e-ANP), 08 – 10 April 2015
Par. 5.1 to 5.2.4	Replace "AFTN" with "AFTN or AMHS"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Par. 5.4.1	"~~Amendment 75 to~~ Annex 3, paragraph 11.1.9 allows the use of the Internet for non-time critical OPMET information"	Remove redundant reference to Am. 75 (ROBEX WG/13)
Par. 6.1.7	Replace "AFTN" with "AFTN or AMHS"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Par. 7.1.3	Replace "AFTN" with "AFTN or AMHS"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Par. 7.2.1	"Originating AMOs (or other designated forecasting offices) should prepare the required TAF messages for the periods of validity indicated in Appendix B. In accordance with Annex 3 [6.2.2], TAF shall be issued not earlier than one hour prior to the beginning of its validity period. TAFs should be sent by the AMOs or NOCs ~~and~~ to the responsible ROBEX center before the cut-off time set up by this centre e.g., 15 minutes before the filing/transmission times specified in Appendix B".	Realign with Amendment 76 to Annex 3, Realign with paragraph 7.3.3 (ROBEX WG/13)
Par. 7.3.4	"~~The filing time for 24- and 30-hour TAF bulletins should be one hour before the start of the validity period~~In accordance with Annex 3 [Appendix 10, 2.1.2], TAF [bulletins] should be filed for transmission [by ROBEX centres] not earlier than one hour prior to the beginning of their validity period The filing/transmission times specified in **Appendix B** ensure the OPMET information is available to the users twenty five (25) minutes prior to the beginning of the TAF validity period"	Realign with Amendment 76 to Annex 3 and ensure at least 25 minutes lead time between transmission of TAF bulletin and beginning of TAF validity period. (ROBEX WG/13)
Par. 7.4.1.2	In the table; headings of 3rd and 5th columns: "Filing time (not prior to)"	Realign with Amendment 76 to Annex 3 (ROBEX WG/13)
Par. 7.5.1	In the table; 2nd column, replace "ROBEX Centre via AFTN" with "ROBEX Centre via AFTN or AMHS"	Realign with Amendment 76 to Annex 3 (ROBEX WG/13)

Section/page	Amendment	Notes/reasoning (Reference)
Par. 7.5.1	In the table 'TAF issuance, compiling and filing'; 3rd column 'Explanation of Time': "State determines time of the beginning of the validity period for four (4) scheduled TAFs (emphasis on consistency, i.e. 00, 06, 12, 18Z every day) Note that issuance time of TAF (which is not earlier than one hour ~~before~~prior to the ~~start~~beginning of its validity ~~period of validity of the TAF~~) is used in the date/time group (DTG) (YYGGggZ) of TAF messages TAF is sent to ROBEX Centre before the cutoff time of accepting TAF for filing ~~one hour before the start period of validity time~~as indicated in Appendix B (typically 15 minutes before filing)" … "TAF should be filed for transmission ~~at least~~not earlier than one hour ~~before~~prior to the ~~commencement~~beginning of their validity period ~~of validity~~, unless otherwise determined by regional air navigation agreement"	Realign with Amendment 76 to Annex 3, Realign with paragraph 7.2.1 (ROBEX WG/13)
Par. 10.1	In the table: Remove "Bahrain/OBBN" and "Jeddah/OEJD"	ROBEX Centres yet to be established (Advised by Secretariat – 27/08/15)
Par. 11.1	In the table: Remove "Beirut" and move "MID and EUR" next to "Jeddah"	Beirut is not an IROG (Advised by Secretariat – 27/08/15)
Par. 11.3 to 11.4	Replace "AFTN" with "AFTN or AMHS"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Par. 12.1.3	Replace "AFTN" with "AFTN or AMHS"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)
Par. 12.3.1.2	Replace "AFTN" with "AFTN or AMHS"	To reflect the transitional state of AMHS implementation (ROBEX WG/13)

Section/page	Amendment	Notes/reasoning (Reference)
Appendix A and Appendix B	Add the following note to Table A and Table B: "The MID OPMET data exchange schema presented here within will become obsolete by approximately the end of 2015. The MID Region OPMET schema is currently being updated such that OPMET from each State in the MID Region as per MID FASID Table MET 2A requirements is sent to IROG Jeddah for international distribution. OPMET data from other Regions needed in each MID State is/will be received by ROC Jeddah which is/will be obtained from other IROGs. IROG Jeddah will also distribute non-routine OPMET data (e.g. SIGMET) to IROG Vienna for distribution to IROG London in order to be available on SADIS"	Clarify current status of MID Region OPMET schema (Advised by Secretariat – 27/08/15)
Appendix A	In the header information: "~~Non-AOP a~~Aerodromes not listed in Table AOP 1 indicated in *italics*"	Realign with official terminology (MET SG/19)
Appendix A	Under ROBEX Centre Bangkok VTBB: delete details for locations VVTS, VVNB, VVDN and VVPB from METAR Bulletin SAAE31 and add new METAR Bulletin SAAE33 (including details for locations VVTS, VVNB, VVDN, VVPB, VVCR, VVCT, VVPQ)	(ROBEX WG/12 – WP/14 (18/03/14))
Appendix A	Under ROBEX Centre Brisbane YBBN: rearrange aerodromes listed in bulletins SAAU31 and SAAU32 and new bulletins SAAU33, SAAU34 and SAAU35	To reflect current service requirement as advised by Australia (MET SG/19 – Flimsy 05)
Appendix A	Under ROBEX Centre Colombo VCCC; METAR Bulletin SASB31: add details for location VCRI	Realign with FASID Table MET 1A (Amendment APAC 13/11 – MET)
Appendix A	Under ROBEX Centre Jakarta WIII: indicate OPMET availability times for WIHH, WIDN, WABP, WAKK and WALR	To reflect current service requirement as advised by Indonesia (MET SG/19 – Flimsy 04)
Appendix A	Under ROBEX Centre Tokyo RJTD; METAR Bulletin SASJP38: add details for location RJFS SAGA	As advised by Japan to reflect current service provided. Note: RJFS is not listed in AOP tables (ROBEX WG/13)
Appendix A	Under ROBEX Centre Wellington; METAR Bulletin SANZ31: add Bul. Time HH + 30	Realign with current requirement for half-hourly routine observations issued as METAR in New Zealand

Section/page	Amendment	Notes/reasoning (Reference)
Appendix B	In the header information: "In order to comply with ~~the Basic ANP~~ Amendment 76 to Annex 3, the TAF filing time ~~shall~~ should be not earlier than 1 hour before the start of the period of validity"	Realign with Amendment 76 to Annex 3, i.e., TAF should be filed for transmission not earlier than one hour prior to the beginning of their validity period. (MET SG/19)
Appendix B	In the header information: "~~Non-AOP a~~Aerodromes not listed in Table AOP 1 indicated in *italics*"	Realign with official terminology (MET SG/19)
Appendix B	Under all TAF bulletins: change the filing time (in the 6th column of the table) to correspond to the time 25 minutes prior to the start of validity (in the 7th column of the table)	Realign with Amendment 76 to Annex 3 (i.e., filing time of TAF bulletins by ROBEX centres should allow for compilation of TAF which shall be issued not earlier than one hour prior to the beginning of its validity period) and ensure that TAF bulletins are available to users at least 25 minutes prior to the commencement of the validity period (ROBEX WG/13) Delay changes to MID Region bulletin filing times until coordination is completed with MID Region (MET SG/19)
Appendix B	Under ROBEX Centre Bangkok VTBB: delete location details for VVTS, VVNB, VVDN and VVPB from TAF Bulletin FTAE32 and add new TAF Bulletin FTAE34 (including details for locations VVTS, VVNB, VVDN, VVPB, VVCR, VVCT, VVPQ)	(ROBEX WG/12 – WP/14 (18/03/14))
Appendix B, page B-2	Under ROBEX Centre Bangkok VTBB; TAF Bulletin FTAE33: change the start of validity to 0600, 1200 and 0000	(As advised by RODB Bangkok)
Appendix B	Under ROBEX Centre Bangkok VTBB; TAF Bulletin FTTH31: add details for location VTPH	(As advised by RODB Bangkok)
Appendix B	Under ROBEX Centre Bangkok VTBB; TAF Bulletin FTTH33: add details for location VTBO	(As advised by RODB Bangkok)
Appendix B	Under ROBEX Centre Brisbane YBBN; TAF Bulletin FTAU32: add details for locations YBRM, YPXM, YPCC, YMHB, YMLT, YSNF, YPPD, YBRK, YWLM, YCFS, YLHI, and delete details for location YGEL	As proposed by Australia (ROBEX WG/13 – IP/5)

Section/page	Amendment	Notes/reasoning (Reference)
Appendix B	Under ROBEX Centre Brisbane YBBN; TAF Bulletin FTAU33: delete details for locations YBRM, YPXM, YPCC, YMHB, YMLT, YSNF, YPPD, YBRK, YWLM, YCFS and add details for location YGEL and YAMB	As proposed by Australia (ROBEX WG/13 – IP/5)
Appendix B	Under ROBEX Centre Brisbane YBBN; TAF Bulletin FTAU34: delete details for locations YAMB, YPKU, YPGV and delete the note "*1200 TAF is not issued"	As proposed by Australia (ROBEX WG/13 – IP/5)
Appendix B	Under ROBEX Centre Brisbane YBBN; TAF Bulletin FTAU35: add details for locations YPKU, YPGV and change TAF validity for YCIN and YFRT to 12	As proposed by Australia (ROBEX WG/13 – IP/5)
Appendix B	Under ROBEX Centre Brisbane YBBN; TAF Bulletin FTAU34: change filing times to "0500, 1100, 1700 and 2300"; and TAF Bulletin FTAU35, change filing times to "0100, 0700, 1300 and 1900"	As proposed by Australia (MET SG/19)
Appendix B	Under TAF Bulletin FTNG31: delete the note "*doc 7910 is expected to be updated from AUUU to ANYN"	Remove redundant information (ROBEX WG/13)
Appendix B	Under ROBEX Centre Mumbai VABB; TAF Bulletin FTIN32: add details for location VCRI	Realign with FASID Table MET 1A (Amendment APAC 13/11 – MET)
Appendix B	Under ROBEX Centre Tokyo RJTD; TAF Bulletins FTJP31, FTJP32 and FTJP38: change the TAF validity for all locations to 30 hours	As advised by Japan to reflect current service provided (ROBEX WG/13)
Appendix B	Under ROBEX Centre Tokyo RJTD, TAF Bulletin FTJP38: add details for location RJFS SAGA	As advised by Japan to reflect current service provided. Note: RJFS is not listed in AOP tables (ROBEX WG/13)
Appendix C	Under Table C; first part of table: "~~AOP~~ Aerodromes listed in Table AOP 1" Second part of table: "Additional ~~non-AOP~~ Aerodromes not listed in Table AOP 1"	Realign with official terminology (ROBEX WG/13)
Appendix C	Under (Aerodromes listed in Table AOP 1) AUSTRALIA: change FT bulletin for YPXM, YPCC, YMHB, YSNF, YPPD and YBRK to FTAU32 YBBN	Realign with Appendix B changes (As proposed by Australia in ROBEX WG/13 – IP/5)
Appendix C	Under (Aerodromes listed in Table AOP 1) SRI LANKA: add details for location VCRI	Realign with FASID Table MET 1A (Amendment APAC 13/11 – MET)

Section/page	Amendment	Notes/reasoning (Reference)
Appendix C	Under (Aerodromes listed in Table AOP 1) VIET NAM; Column 4: replace SAAE31 with SAAE33, and Column 5, replace FTAE32 with FTAE34	(ROBEX WG/12 – WP/14 (18/03/14))
Appendix C	Under (Additional Aerodromes not listed in Table AOP 1) AUSTRALIA: Change FT bulletin for YBRM, YCFS, YMLT and YWLM to FTAU32 YBBN; Change FT bulletin for YAMB to FTAU33 YBBN; Change FT bulletin for YCIN, YFRT, YPGV and YPKU to FTAU35 YBBN; and Add "*LORD HOWE ISLAND,* YLHI, FTAU32 YBBN"	Realign with Appendix B changes (As proposed by Australia in ROBEX WG/13 – IP/5)
Appendix C	Under (Additional Aerodromes not listed in Table AOP 1) AUSTRALIA: Realign SAAU bulletin numbers with changes made to Appendix A, SAAU31, SAAU32, SAAU33, SAAU34 and SAAU35 Bulletins	(As proposed by Australia in MET SG/19 – Flimsy 05)
Appendix C	Under (Additional Aerodromes not listed in Table AOP 1) Thailand: next to *PRACHUAP KHIRI KHAN/Huan Hin*: add FTTH31 VTBB; next to *TRAT/Khao Sming*: add FTTH33 VTBB; next to location indicator VTUDS: add UDON THANI	As advised by Thailand (ROBEX WG/13)
Appendix H, par. 1.1.5	In the table; 2nd row: "SIGMET for TS, ~~CB,~~ TURB, ICE, MTW, DS, ~~and~~ SS and RDOACT CLD …"	Realign with Annex 3 requirements, Appendix 6, 1.1.4 (ROBEX WG/13)
Appendix H, par. 2.1.1	Under the headings *(i) Compliance Index*, *(ii) Availability Index* and *(iii) Regularity Index*: add the additional explanatory information and guidance provided by Thailand.	(ROBEX WG/12 – Flimsy 1 (17/03/14))
Appendix I	Change ROBEX focal point details for Japan: "~~Mr. Yuichi Yamakoshi~~ Mr. Jun Ryuzaki … email: ~~y-yamakoshi@met.kishou.go.jp~~ jryuzaki@met.kishou.go.jp"	As advised by Japan (ROBEX WG/13)

Section/page	Amendment	Notes/reasoning (Reference)
Appendix I	Change ROBEX focal point details for Republic of Korea: "~~Mr. Lee Seung-ju~~ Ms. Park Jieun ~~Assistant Director~~ Senior Meteorologist … ~~Information and Technology Support~~ Observation and Forecast Division … Tel:+82 (32) 7402840~~40~~20, Fax:+82 (32) 7402847~~7~~07, e-mail: ~~eavok75@korea.kr~~ jieuni@korea.kr" "Ms. Kim Youn-jeong … Information and Technology ~~Support~~ Division …" "*Administration units OPMET/ROBEX,* ~~Aviation Meteorological Office, 2172-1, Woonseo-dong, Joong-gu, Incheon 400-340~~ Korea Aviation Meteorological Agency (KAMA), 272 Gonghang-ro, Jung-gu, Incheon, 400720 (P.O. Box 43) (Location Indicator : RKSIYPYX)"	As advised by Republic of Korea (ROBEX WG/13)

APAC ICD – List of updates – 2015

Section/page	Amendment	Notes/reasoning
Appendix A, Appendix B, Appendix D and Appendix E	Under Australia: update composition of YBBN bulletins SAAU31, SAAU32, SAAU33, SAAU34, SAAU35, FTAU31, FTAU32, FTAU33, FTAU34 and FTAU35	As advised by Australia (MET SG/19, Flimsy 06 refers)
Appendix A, page A-6	Under Republic of Korea, next to bulletin SAKO31, delete the locations: RKJJ, RKJY, RKPS, RKPU and RKTH	As advised by Republic of Korea
Appendix B, page B-4	Under Korea, next to bulletin SAKO31, add the location: RKJB	As advised by Republic of Korea
Appendix E, page E-11	Under Korea, Republic of, next to bulletin FTKO31 (RKSL), add the locations: RKJB and RKTN; next to bulletin SAKO31 (RKSL), add the location: RKJB; and delete the entire row for bulletin SAKO41	As advised by Republic of Korea
Appendix D, page D-7	Australian TAF/METAR bulletins (became effective on 30 Apr 2015)	As advised by Singapore (21 May 2015)
Appendix D, page D-9	Hong Kong ROBEX TAF/METAR bulletins (wef 10 Feb 2015)	As advised by Singapore (21 May 2015)
Appendix D, page D-10	Updates of Indonesian Location Indicators in respective SA/FT bulletins (wef 5 Mar 2015).	As advised by Singapore (21 May 2015)

List of suggested changes to the Regional SIGMET Guide template

Paragraph*	Details or description of changes
1.1.1.	"…hazardous weather phenomena which may affect safety of aircraft operations, known as SIGMET…."
1.1.2.	Realign reference to Doc 7030 to correct section, i.e., ~~Part 1, 11.2~~ Chapter 6, 6.13.2 Remove underline from Doc 8896
1.1.4.	Add the following new paragraph to provide a reference and context for the inclusion of Appendix C: 1.1.4. To support regional management of SIGMET issuance and dissemination, Appendix C of the regional SIGMET guide contains guidance on the purpose, scope and procedures for conducting regional SIGMET tests.
2.1.1.	"…hazardous meteorological phenomena which may affect safety of aircraft operations; hence they are considered…"
2.2.5.	Add the following text to provide a reference and context for the inclusion of the table in Appendix A: "… this regional SIGMET guide, including a simplified version of Table A6-1 in Appendix A, provides…."
2.2.8.	Change "should" to "shall" (Annex 3, Appendix 4, 3.1.3 refers) Part b): "…send the special air-report for onward transmission to MWOs, WAFCs, and other meteorological offices in accordance with regional air navigation agreement in the case that…"
2.3.5.	Replace "air report" with "air-report"
2.6.4.	"… volcanic eruptions or the presence of volcanic ash clouds. Guidance including responsibilities for the issuance ~~The format~~ of the VONA is given in the *Handbook on the International Airways Volcano Watch (IAVW) – Operational Procedures and Contact List (Doc 9766)*~~,~~; the format of the VONA is given in Appendix E of the Doc 9766.
3.2.1.	Table 1, 3rd row, 2nd column: "…readily recognized by the pilot in command." Table 1, 5th row, 2nd column: "…little or no space between cumulonimbus clouds (CB)." Table 1, 7th row, 2nd column: "Thunderstorms with hail that are embedded…" Table 1, 9th row, 2nd column: "…little or no space between cumulonimbus clouds (CB)."
3.5.1.1.	Insert the note on SIGMET jargon (extracted from Appendix C, 1.4) below Table 3: "*Note: 1) Tropical cyclone and volcanic ash cloud SIGMETs will be referred to hereafter as WC SIGMET (due to the T_1T_2 section of the WMO AHL being set to WC) and WV SIGMET (due to the T_1T_2 section of the WMO AHL being set to WV) respectively. All other SIGMET types will be referred to by WS (due to the T_1T_2 section of the WMO AHL being set to WS).*"
3.5.1.1.	Insert the note: "*2) WMO AHLs for SIGMET bulletins used by ASIA/PAC MWOs are listed in Appendix D to the Regional SIGMET Guide.*"
3.5.1.4.	Add the following new paragraph to provide guidance on the use of the WMO header indicator [BBB]: 3.5.1.4. The group BBB should be used only when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall have the following form: CCx for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc. Examples: WSTH31 VTBS 121200 WVJP31 RJTD 010230 WCNG21 AYPY 100600 CCA

* Shaded cells indicate additional changes adopted at MET SG/19

Paragraph*	Details or description of changes
3.5.3.1.	Table 5, 2nd row, 1st, 2nd and 3rd columns: Add "(M)" after the text (to indicate mandatory) Table 5, 2nd row, 4th, 5th, 6th, 7th and 8th columns: Add "(C)" after the text (to indicate conditional) Add the following key below Table 5: "Key: M = inclusion mandatory, part of every message; C = inclusion conditional, included whenever applicable."
3.5.3.4.	"…represents the time of commencement of ~~the phenomenon~~ validity**."**
3.5.3.5. 1)	Remove the second full-stop "… by a polygon.~~.~~"
3.5.3.6.	Add "or nnnn/nnnnFT" after "or FLnnn/nnn" and before "or TOP FLnnn"
3.5.3.6. 3)	"… For example: FL250/~~FL~~290"
3.5.3.7.	"…MOV <direction><speed>KMH~~[KT]~~ or MOV <direction><speed>KT…."
3.5.3.7.	*"...Note. — ~~When also including a forecast position, care should be taken to ensure that the rate of movement and forecast position are consistent.~~ Movement information should not be provided when a forecast position is explicitly given."*
3.5.3.9.	*"Note: - Annex 3 (18th Edition, July 2013)… forecast position information ~~relating to~~ for the end of the validity period for all SIGMET-related hazardous phenomena…"*
3.5.3.9.	Delete the whole duplicated section of text commencing with the paragraph "The forecast position of the phenomenon ……" down to the example "3) At a specific point within the FIR, … S23 E107" and replace it with "Refer to section 3.5.3.5. for examples."
3.5.3.9.	"*Note. — Currently, there is no provision ... both initial and forecast positions. If levels differ significantly then separate SIGMET should be issued.*"
3.5.4.1.	Table 6, 2nd row, 1st, 2nd and 3rd columns: Add "(M)" after the text (to indicate mandatory) Table 6, 2nd row, 4th, 5th, 6th, 7th and 8th columns: Add "(C)" after the text (to indicate conditional) Add the following key below Table 6: "Key: M = inclusion mandatory, part of every message; C = inclusion conditional, included whenever applicable." Table 6 is refered to in the text of paragraph 3.5.4.1.
3.5.4.6.	Add "or nnnn/nnnnFT" after "or FLnnn/nnn" and before "or TOP FLnnn"
3.5.4.6. 3)	"… For example: FL250/~~FL~~290"
3.5.4.6.	Add the following paragraph at the end of this section to reflect the intent of Annex 3, Chapter 7, clause 7.1.4: "The SIGMET should be based on the VAA unless additional information is available. This additional information must be forwarded to the responsible VAAC without delay."
3.5.4.7.	"…MOV <direction><speed>KMH~~[KT]~~ or MOV <direction><speed>KT…."
3.5.4.7.	*"...Note. — ~~When also including a forecast position, care should be taken to ensure that the rate of movement and forecast position are consistent.~~ Movement information should not be provided when a forecast position is explicitly given."*
3.5.4.9.	"The forecast position of the volcanic ash cloud at the end of the validity period of the SIGMET message should not to be used in conjunction with the movement or expected movement of the volcanic ash cloud. The area affected by a volcanic ash cloud at the end of the validity period can be described in the following ways…."

Paragraph*	Details or description of changes
3.5.4.9.	"The GGggZ group should … geometrical approximation of the cloud. Refer to graphical examples in Appendix B. *Note. — Currently, there is no provision … both initial and forecast positions.*"
3.5.4.10.	Underline text and assign new paragraph number to indicate it is a new sub-heading: "3.5.4.10. Inclusion of multiple instances of volcanic ash phenomena"
3.5.5.1.	Table 7, 2nd row, 1st, 2nd and 3rd columns: Add "(M)" after the text (to indicate mandatory) Table 7, 2nd row, 4th, 5th, 6th, 7th and 8th columns: Add "(C)" after the text (to indicate conditional) Add the following key below Table 7: "Key: M = inclusion mandatory, part of every message; C = inclusion conditional, included whenever applicable."
3.5.5.6.	Add the following paragraph at the end of this section to reflect the intent of Annex 3, Chapter 7, clause 7.1.4: "The SIGMET should be based on the TCA unless additional information is available. This additional information must be forwarded to the responsible TCAC without delay."
3.5.5.7.	"…MOV <direction><speed>KMH~~[KT]~~ or MOV <direction><speed>KT…."
3.5.5.7.	Add the note at the end of the paragraph: *"Note. — Movement information should not be provided when a forecast position is explicitly given."*
3.5.5.9.	"FCST <GGgg>Z TC CENTRE <location> The forecast position of the tropical cyclone centre at the end of the validity period of the SIGMET message should not to be used in conjunction with the movement or expected movement of the tropical cyclone. The time given by GGggZ should be the same…."
Appendix A	
Pages A-1 to A-10	Removal of references to AIRMET and subsequent footnote numbering updated. Other minor changes to text.
Appendix B	
Section 1	2nd example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z WI N4230 E02145 – N4315 E02115 – N4345 E02145 – N4330 E02215 – N4245 E02230 - N4230 E02145 FL250/370 ~~MOV ESE 20KT~~ INTSF FCST 1600Z WI N4145 E02315 – N4230 E02200 – N4330 E02215 – N4315 E02345 - N4145 E02315="
Section 1	4th example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z WI N4230 E02052 – N4245 E02145 – N4130 E02200 – N4107 E02130 – N4123 E02045- N4230 E02052 FL250/370 ~~MOV SE 30KT~~ WKN FCST 1600Z WI N4230 E02052 – N4145 E02245 – N4045 E02330 – N4040 E02248 – N4123 E02045- N4230 E02052="
Section 1	Refer to the correct longitude for the turning point on the FIR boundary, i.e., ~~E02245~~ E02445
Section 1	5th example SIGMET: "YUDD SIGMET … – N4445 ~~E02245~~ E02225 – … MOV SE 20KT WKN="

Paragraph*	Details or description of changes
Section 1	6th example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z WI N4315 E02145 – N4445 E02245 – N4330 E02445 – N4200 E02455 – N4230 E02245- N4315 E02145 FL250/370 ~~MOV SE 20KT~~ WKN FCST 1600Z WI N4300 E02245 – N4415 E02315 – N4322 E02452 – N4155 E02445 – N4215 E02330- N4300 E02245="
Section 2a)	2nd example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z NE OF LINE N4230 E02052 – N4100 E02430 FL250/370 ~~MOV NE 15KT~~ WKN FCST 1600Z NE OF LINE N4346 E02122 – N4130 E02452="
Section 2a)	3rd example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z NE OF LINE N4230 E02052 – N4100 E02430 FL250/370 ~~MOV NE 15KT~~ WKN FCST 1600Z NE OF LINE N4346 E02122 – N4130 E02457="
Section 2b)	2nd example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z S OF N4300 AND W OF E02215 FL250/370 ~~MOV S 12KT~~ WKN FCST 1600Z S OF 4215 AND W OF E02215="
Section 2c)	2~~d~~c) 2nd example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z N OF N43 FL250/370 ~~MOV N 15KT~~ WKN FCST 1600Z N OF N44="
Section 2c)	3rd example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR SEV TURB FCST AT 1200Z N OF N43 FL250/370 ~~MOV N 15KT~~ WKN FCST 1600Z N OF N44="
Section 4	1st SIGMET example: "YUDD SIGMET 2 VALID 101200/101600 YUSO – … WI N4315 ~~E02145~~ E02115 – N4345 E02145 – ~~N4230~~ N4330 E02215 – … MOV ESE 20KT NC=
Section 4	2nd example: "YUDD SIGMET 2 VALID 101200/101800 YUSO – … FL250/370 ~~MOV ESE 20KT~~ NC FCST 1800Z VA CLD APRX … – N4330 E02215="
Section 4	3rd SIGMET example: "YUDD SIGMET 2 VALID 101200/101800 YUSO – … WI N4315 E02115 – ~~N4245~~ N4345 E02145 – … FL250/370 ~~MOV ESE 20KT~~ NC FCST 1800Z VA CLD APRX … – N4315 E02115==
Section 4	4th example SIGMET: "YUDD SIGMET 2 VALID 101200/101800 YUSO – … N4330 E02215 – N4245 ~~E02130~~ E02230 – N4230 E02145 – N4315 E02115 FL250/370 MOV ESE 20KT WKN FCST 1800Z NO VA EXP="
Section 5	1st example SIGMET: "YUDD SIGMET 2 VALID 101200/101600 YUSO – YUDD SHANLON FIR/UIR ~~SEV TURB~~ VA CLD FCST AT 1200z ENTIRE FIR FL250/370 STNR WKN FCST 1600z ENTIRE FIR="

Paragraph*	Details or description of changes
Section 5	2nd example: "YUDD SIGMET 2 VALID 101200/101800 YUSO – … FL250/370 ~~MOV ESE 20KT~~ NC FCST 1800Z VA CLD … AND N4200 E02115 – … FL150/300 ~~MOV ESE 20KT~~ NC FCST 1800Z VA CLD … - N4200 E02145="
Section 6	1st example: "YUDD SIGMET 2 VALID 101200/101800 YUSO – YUDD SHANLON FIR/UIR TC GLORIA FCST AT 1200Z N2200 W06145 CB TOP FL500 WI 75NM OF CENTRE ~~MOV NW 20KT~~ WKN FCST 1800Z TC CENTRE N2330 W06315="
Section 6	2nd example: "YUDD SIGMET 2 VALID 101200/101800 YUSO – YUDD SHANLON FIR/UIR TC GLORIA FCST AT 1200Z N2100 W06200 CB TOP FL500 WI 20NM OF CENTRE ~~MOV NW 20KT~~ WKN FCST 1800Z TC CENTRE N2230 W06330 AND TC HARRIET FCST AT 1200Z N2215 W06100 CB TOP FL400 WI 20NM OF CENTRE ~~MOV NW 20KT~~ WKN FCST 1800Z TC CENTRE N2345 W06230="
Appendix C	
1.2.	"This document describes the procedures for conducting regional SIGMET tests ~~as described in this document~~…."
1.4.	Delete the paragraph; move the text to the new note under paragraph 3.5.1.1. in the main body of the SIGMET guide.
3.1.1.4.	Refer to the ANP FASID Tables MET 3A and 3B for the list of WC and WV SIGMET test participating MWOs, rather than duplicate the list of MWOs
3.1.1.5.	Add paragraph 3.1.1.5: "World Area Forecast Centres (WAFCs): London, Washington."
3.1.2.1.	"… shown ~~on page C-6~~ in paragraphs 4.1-4.2 of this Appendix."
3.1.2.2.	" See ~~page C-7~~ paragraphs 4.3-4.5 of this Appendix for examples…."
3.1.2.3.	"…TEST VA or TC~~A~~ advisory within 30 minutes … indicating that the test VA~~A~~ or TC~~A~~ advisory was not received…"
3.1.2.4.	Delete the entire paragraph, which is redundant in view of the common procedures provided further down in section 3.3.
3.2.1.2.	Refer to the ANP FASID Table MET 1B for the list of WS SIGMET test participating MWOs, rather than duplicate the list of MWOs
3.2.1.3.	Add paragraph 3.2.1.3: "World Area Forecast Centres (WAFCs): London, Washington."
3.3.1.1.	"….suggested that the TEST SIGMET sequence number should be Z99.
3.3.1.2.	"~~Test SIGMETs will use the next normally available sequence number for test SIGMET messages or the first available sequence number of any pre-defined letter assigned to test SIGMETs for those States identifying SIGMETs using an alphanumerical sequence number (ex: T1 or Z99)"~~
3.4.1.	"…shown ~~on pages C-8 and C-9 of this guide~~ in section 5 of this Appendix, should…" "…focal point given in ~~section~~ paragraph 3.4.3., below, with a copy to…"
3.4.1.	"… *Note. — To facilitate access to TEST SIGMETs and advisories, Appendix D and E to the Regional SIGMET Guide, respectively, provide listings of the WMO AHLs for SIGMET and volcanic ash/tropical cyclone advisory bulletins used by ASIA/PAC MWOs and VAACs/TCACs.*"
3.4.3.	"WV/WC SIGMET summary table sent to: Mr. ~~Yuichi Yamakoshi~~ Jun Ryuzaki … e-mail: ~~y-yamakoshi@met.kishou.go.jp~~ jryuzaki@met.kishou.go.jp"
General	Renumbering of paragraphs after section 3.
4.1	"OBS VA CLD: ASH NOT IDENTIFIABLE ~~FROM~~ FM SATELLITE DATA"

Paragraph*	Details or description of changes
4.3	" … RECEIVED FM [NAME] VAAC AT …"
4.3	Since TEST SIGMET should still be issued even when TEST VA or TC advisory is not received within 30 minutes of the commencement time of the test. "WVJP31 RJTD ~~170205~~ 170235 RJJJ SIGMET Z99 VALID ~~170205/170215~~ 170235/170245 RJTD- RJJJ FUKUOKA FIR THIS IS A TEST SIGMET, PLEASE DISREGARD. TEST VA ADVISORY NOT RECEIVED FM [NAME] VAAC ="
4.4	" … RECEIVED FM [NAME] TCAC AT …"
4.5	"Format of TEST SIGMET for ~~other weather~~ phenomena other than volcanic ash and tropical cyclone"
Appendix D	
D-1 to D-3	Include Appendix D: the list of WMO AHLs for SIGMET bulletins used by ASIA/PAC MWOs (previously Appendix H in 4th Edition of SIGMET Guide). Update to Nauru and Solomon Islands information.
Appendix E	
E-1 to E-2	Include Appendix E: the list of WMO AHLs for VA/TC Advisory bulletins used by ASIA/PAC VAACs/TCACs (previously Appendix I in 4th Edition of SIGMET Guide). Update to Darwin TCAC area of responsibility.
Appendix F	
F-1 to F-8	Include Appendix F: Asia/Pacific VAAC back-up procedures (previously Appendix K in 4th Edition of SIGMET Guide), excluding examples and proforma.
Appendix G	
G-1 to G-12	Include Appendix G: Tokyo/Darwin VAAC back-up procedures (previously Appendix L in 4th Edition of SIGMET Guide). Updated procedures consistent with the 2014 back-up exercise.
Appendix H	
H-1 to H-12	Include Appendix H: Wellington/Darwin VAAC back-up procedures.

SIGMET PAMPHLETS

SIGMET QUICK REFERENCE GUIDE

WS SIGMET

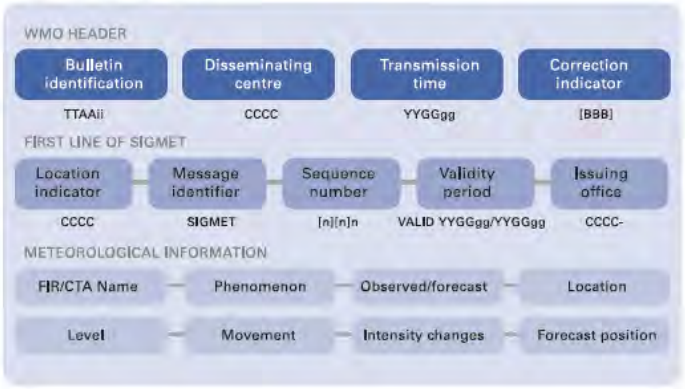
SIGMET Abbreviations

ABV	Above
CNL	Cancel or cancelled
CTA	Control area
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
SFC	Surface
STNR	Stationary
TOP	Top (of CB cloud)
WI	Within (area)
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WS SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WS SIGMET provides information on phenomena other than tropical cyclones and volcanic ash.

SIGMET Structure



WMO Header

Bulletin identification

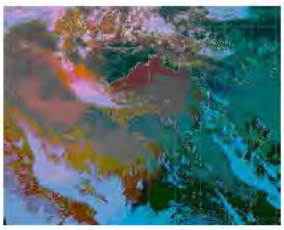
TT	Data type designator	**WS** – for SIGMET for meteorological phenomena other than volcanic ash cloud and tropical cyclone
AA	Country or territory designators	Assigned according to Table C1, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)
ii	Bulletin number	Assigned on national level according to Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)

Disseminating centre

CCCC is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

Transmission time

YYGGgg is the date/time group; where YY is the day of the month and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).



MTSAT-1R icing enhancement. Dark areas indicate the presence of supercooled liquid water (black by night, red by day). High level cirrus (bright areas) may prevent the satellite from seeing the lower level clouds.

Anvil of a cumulonimbus cloud

Duststorm, Sydney, 23 September 2009. Image courtesy of Elly Spark, Bureau of Meteorology.

Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET**.

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. The period of validity for a WS SIGMET shall be no more than 4 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

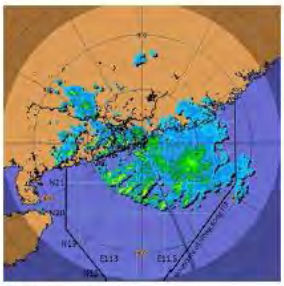
Meteorological Information

FIR/CTA Name

The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR[/UIR] or CCCC <name> CTA**.

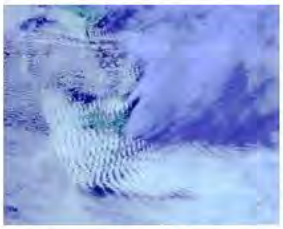
Phenomenon

Code	Description
OBSC TS	Obscured thunderstorms
EMBD TS	Embedded thunderstorms
FRQ TS	Frequent thunderstorms
SQL TS	Squall line thunderstorms
OBSC TSGR	Obscured thunderstorms with hail
EMBD TSGR	Embedded thunderstorms with hail
FRQ TSGR	Frequent thunderstorms with hail
SQL TSGR	Squall line thunderstorms with hail
SEV TURB	Severe turbulence
SEV ICE	Severe icing
SEV ICE (FZRA)	Severe icing due to freezing rain
SEV MTW	Severe mountain wave
HVY DS	Heavy duststorm
HVY SS	Heavy sandstorm
RDOACT CLD	Radioactive cloud



Widespread thunderstorms affecting the Southern China and the northern part of South China Sea on 9 May 2014.

E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west



Satellite image of mountain waves over Tasmania, 3 December 2002.

Observed or forecast

Whether the phenomenon is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the phenomenon is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes.

Level

The level or vertical extent of the phenomenon:
FLnnn or **nnnnM** or **nnnnFT** or **SFC/FLnnn** or **SFC/nnnnM** or **SFC/nnnnFT** or **FLnnn/nnn** or **nnnn/nnnnFT** or **TOP FLnnn** or **ABV FLnnn** or **TOP ABV FLnnn**.

Movement

Direction and rate of movement of the phenomenon where the direction is given with reference to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH**. The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Intensity changes

The expected evolution of the phenomenon's intensity as indicated by:
INTSF or **WKN** or **NC**

Forecast position (optional)

The forecast position of the hazardous phenomena at the end of the validity period of the SIGMET message in the form **FCST <GGgg>Z <location>**.

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validity period is due to expire but the phenomenon is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the phenomenon for which the SIGMET was issued is no longer occurring or is no longer expected, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation CNL in lieu of meteorological information.
CNL SIGMET [n][n]n YYGGgg/YYGGgg

Source of Information

Source of Information	Phenomena
Surface and upper-air observations Special AIREP Satellite pictures NWP forecasts	Thunderstorms, dust/sandstorms, turbulence, mountain waves, icing
RADAR Lightning information	Thunderstorms
WMO RSMC (Atmospheric transport modelling for environmental emergency)	Radioactive cloud

SIGMET Dissemination

SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be **FF**.

WS Examples

Format

WSAAii CCCC YYGGgg [BBB]
CCCC SIGMET [n][n]n VALID YYGGgg/YYGGgg CCCC-
CCCC <FIR/CTA Name> FIR <Phenomenon> OBS/FCST
[AT GGggZ] <Location> <Level> <Movement> <Intensity changes> <Forecast position>=

Thunderstorms

WSSS20 VHHH 090900
VHHK SIGMET 3 VALID 090900/091300 VHHH-
VHHK HONG KONG FIR EMBD TS OBS AT 0900Z N OF N2000 AND E OF E11330 TOP FL400 INTSF FCST 1300Z N OF N2000 AND E OF E11300=

Duststorms

WSAU21 ADRM 240330
YMMM SIGMET D01 VALID 240330/240430 YPDM-
YMMM MELBOURNE FIR HVY DS OBS WI S2300 E13415 – S2240 E13800 – S2520 E13800 – S2525 E13520 – S2300 E13415 SFC/7000FT MOV N 25KT NC=

Sandstorms

WSCI33 ZBAA 301110
ZBPE SIGMET 2 VALID 301110/301510 ZBAA-
ZBPE BEIJING FIR HVY SS OBS AT 1100Z N OF N40 SFC/2000M MOV E 30KMH NC=

Turbulence

WSNZ21 NZKL 232134
NZZC SIGMET 18 VALID 232134/240134 NZKL-
NZZC NEW ZEALAND FIR SEV TURB FCST WI S3929 E17602 – S4305 E17136 – S4522 E17000 – S4538 E17159 – S4112 E17624 – S3929 E17602 FL180/260 MOV E 25KT INTSF=

Mountain waves

WSAU21 AMRF 061700
YMMM SIGMET M07 VALID 061700/062100 YMRF-
YMMM MELBOURNE FIR SEV MTW OBS WI S3704 E14244 – S3611 E14753 – S3736 E14943 – S4006 E14800 – S3952 E14353 – S3704 E14244 FL080/140 STNR NC=

Icing

WSCI45 ZHHH 021100
ZHWH SIGMET 3 VALID 021100/021500 ZHHH-
ZHWH WUHAN FIR SEV ICE FCST N OF N28 SFC/FL200 STNR NC=

Radioactive cloud

WSSS20 VHHH 180830
VHHK SIGMET 1 VALID 180830/181230 VHHH-
VHHK HONG KONG FIR RDOACT CLD FCST E OF E114 SFC/FL100 MOV E 20KT WKN=

Cancellation

WSSS20 VHHH 181100
VHHK SIGMET 2 VALID 181100/181230 VHHH-
VHHK HONG KONG FIR CNL SIGMET 1 180830/181230=

Australian Government
Bureau of Meteorology

CAA
CIVIL AVIATION AUTHORITY OF NEW ZEALAND

香港天文台
HONG KONG OBSERVATORY

Refer to the following for more information

ICAO *Annex 3 – Meteorological Service for International Air Navigation* (Amd 76)
ICAO *Regional SIGMET Guide*
ICAO Doc.8896 – *Manual of Aeronautical Meteorological Practice*
WMO No.49 *Technical Regulations Volume II – Meteorological Service for International Air Navigation* (2013 ed)
WMO No.732 *Guide to Practices for Meteorological Offices Serving Aviation*

20 August 2015

SIGMET QUICK REFERENCE GUIDE
WC SIGMET

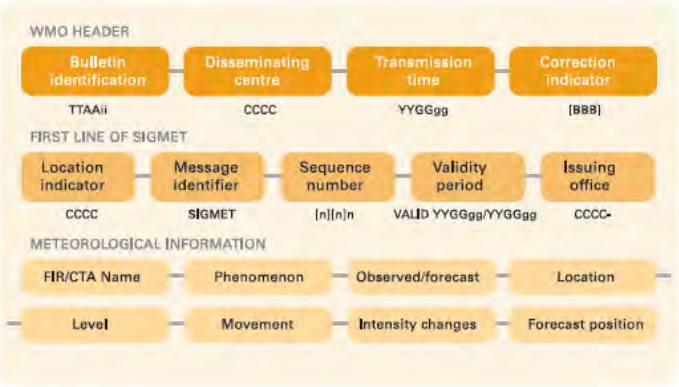
SIGMET Abbreviations

ABV	Above
BLW	Below
CB	Cumulonimbus cloud
CNL	Cancel or cancelled
CTA	Control area
FCST	Forecast
FIR	Flight Information Region
FL	Flight level
FT	Feet
INTSF	Intensify or intensifying
KT	Knots
KMH	Kilometres per hour
M	Metres
MOV	Moving
NC	No Change (in intensity)
NM	Nautical Miles
OBS	Observed
SFC	Surface
STNR	Stationary
TOP	Top (of CB cloud)
WI	Within (area)
WKN	Weakening (intensity)
Z	Coordinated Universal Time

WC SIGMET

A SIGMET provides concise information issued by a Meteorological Watch Office (MWO) concerning the occurrence or expected occurrence of specific en-route weather and other phenomena in the atmosphere that may affect the safety of aircraft operations. The WC SIGMET provides information on tropical cyclones (intensity 34 knots or greater). WC SIGMET should be based on the Tropical Cyclone Advisory.

SIGMET Structure



WMO Header

Bulletin identification

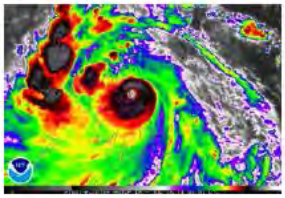
TT	Data type designator	**WC** – for SIGMET for tropical cyclone
AA	Country or territory designators	Assigned according to Table C1, Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)
II	Bulletin number	Assigned on national level according to Part II of *Manual on the Global Telecommunication System*, Volume I – *Global Aspects* (WMO Publication No. 386)

Disseminating centre

CCCC is the ICAO location indicator of the communication centre disseminating the message (this may be the same as the MWO location indicator).

Transmission time

YYGGgg is the date/time group; where YY is the day of the month and GGgg is the time of transmission of the SIGMET in hours and minutes UTC (normally this time is assigned by the disseminating (AFTN) centre).



Typhoon Rammasun landfall in the Philippines on 15 July 2014. Image courtesy NOAA Satellite Services Division.

Damage from Supertyphoon Pongsona on the island of Rota, 20 December 2002. Image courtesy FEMA Photo Library, Andrea Booher.

Satellite image of Severe Tropical Cyclone Yasi approaching Queensland, Australia on 2 February 2011. Image courtesy NASA; MODIS.

Correction indicator

BBB should only be included when issuing a correction to a SIGMET which had already been transmitted. The BBB indicator shall take the form **CCx** for corrections to previously relayed bulletins, where x takes the value A for the first correction, B for the second correction, etc., for a specific SIGMET.

First line of SIGMET

Location indicator

CCCC is the ICAO location indicator of the ATS unit serving the FIR or CTA to which the SIGMET refers.

Message identifier

The message identifier is **SIGMET**.

Sequence number

The daily sequence number in the form **[n][n]n**, e.g. 1, 2, 01, 02, A01, A02, restarts every day for SIGMETs issued from 0001 UTC.

Validity period

The validity period is given in the format **VALID YYGGgg/YYGGgg** where YY is the day of the month and GGgg is the time in hours and minutes UTC. For an observed TC, the start of validity for the SIGMET should be the same as the issue time. For a forecast TC, the start of validity should be the time the TC is expected to enter/develop in a MWO's FIR and can be issued no more than 12 hours prior to the start of validity. The validity period for a WC SIGMET shall be no more than 6 hours.

Issuing Office

CCCC- is the ICAO location indicator of the MWO originating the message followed by a hyphen.

Meteorological Information

FIR/CTA Name

The ICAO location indicator and full name of the FIR/CTA for which the SIGMET is issued in the form **CCCC <name> FIR[/UIR]** or **CCCC <name> CTA**.

Phenomenon

The description of the tropical cyclone consists of the abbreviation TC followed by the international name given by the corresponding WMO RSMC in the form **TC <name>**. If the disturbance is expected to become a TC, but is not yet named, the term **TC NN** should be used.

Observed or forecast

Whether the tropical cyclone is observed or forecast in the form **OBS [AT GGggZ]** or **FCST [AT GGggZ]** where GG is hours and gg minutes UTC.

Location

The location of the centre of the tropical cyclone is provided with reference to geographical coordinates in latitude and longitude in degrees and minutes.

Level

The vertical and horizontal extent of the tropical cyclone in the form:
CB TOP [ABV or **BLW] <FLnnn> WI <nnnKM** or **nnnNM> OF CENTRE**

E	East or eastern longitude
ENE	East-north-east
ESE	East-south-east
N	North or northern latitude
NE	North-east
NNE	North-north-east
NNW	North-north-west
NW	North-west
S	South or southern latitude
SE	South-east
SSE	South-south-east
SSW	South-south-west
SW	South-west
W	West or western longitude
WNW	West-north-west
WSW	West-south-west

Typhoon Jelawat on 9 August 2000, showing clear Annular characteristics. Image courtesy NASA.

Movement

Direction and rate of movement of the tropical cyclone where the direction is given with reference to one of the sixteen points of the compass (using the appropriate abbreviation) and the rate is given in KT (or KMH) in the form **MOV <direction> <speed>KT** or **KMH**. The abbreviation **STNR** (Stationary) is used if no significant movement is expected.

Intensity changes

The expected evolution of the tropical cyclone's intensity as indicated by:
INTSF or **WKN** or **NC**

Forecast position (optional)

The forecast position of the tropical cyclone in the form: **FCST <GGgg>Z TC CENTRE <location>**.

Renewing a SIGMET

A SIGMET is renewed with a new sequence number when the validity period is due to expire but the tropical cyclone is expected to persist.

Cancelling a SIGMET

If, during the validity period of a SIGMET, the tropical cyclone intensity falls below 34 knots or if it has moved out of the FIR, the SIGMET shall be cancelled by issuing a SIGMET with the abbreviation CNL in lieu of meteorological information.
CNL SIGMET [n][n]n YYGGgg/YYGGgg
When cancelling a WC SIGMET consider the need for a WS SIGMET for thunderstorms.

Source of Information

Source of Information	Types of Information	Issue a WC SIGMET
MWO, TCAC	Observations that confirm a tropical cyclone has developed.	TC observed – issue immediately.
	Information concerning a tropical cyclone is received from a TCAC.	TC forecast to enter/develop in MWOs FIR – issue up to 12 hours before the time the TC is expected to enter/develop in FIR.

SIGMET Dissemination

SIGMET is part of operational meteorological (OPMET) information and should be exchanged via aeronautical fixed service (AFS). The SIGMET priority indicator used shall be **FF**.

TCA and WC SIGMET Examples

Tropical Cyclone Advisory (TCA) Example

FKAU05 ADRM 071830
TC ADVISORY

DTG:	20130307/1800Z
TCAC:	DARWIN
TC:	SANDRA
NR:	02
PSN:	S1500 E15600
MOV:	NE 07KT
C:	989HPA
MAX WIND:	35KT
FCST PSN +6HR:	08/0000Z S1500 E15630
FCST MAX WIND +6HR:	40KT
FCST PSN +12HR:	08/0600Z S1448 E15706
FCST MAX WIND +12HR:	45KT
FCST PSN +18HR:	08/1200Z S1454 E15736
FCST MAX WIND +18HR:	50KT
FCST PSN +24HR:	08/1800Z S1500 E15800
FCST MAX WIND +24HR:	60KT
RMK:	NIL
NXT MSG:	20130308/0100Z

FKPQ30 RJTD 090600
TC ADVISORY

DTG:	20150709/0600Z
TCAC:	TOKYO
TC	CHAN-HOM
NR:	38
PSN:	N2320 E12840
MOV:	NW 12KT
C:	960HPA
MAX WIND:	75KT
FCST PSN +6HR:	09/1200Z N2405 E12720
FCST MAX WIND +6HR:	75KT
FCST PSN +12HR:	09/1800Z N2455 E12540
FCST MAX WIND +12HR:	75KT
FCST PSN +18HR:	10/0000Z N2535 E12440
FCST MAX WIND +18HR:	75KT
FCST PSN +24HR:	10/0600Z N2620 E12350
FCST MAX WIND +24HR:	75KT
RMK:	NIL
NXT MSG:	20150709/1200Z =

Tropical Cyclone Advisory Graphic (TCG) Example

Tropical Cyclone SIGMET Format
WCAAii CCCC YYGGgg [BBB]
CCCC SIGMET [n][n]n VALID YYGGgg/YYGGgg CCCC-
CCCC <FIR/CTA Name> FIR TC <Name> OBS/FCST [AT GGggZ] <Location> <Level> <Movement> <Intensity changes> <Forecast position>=

Tropical Cyclone SIGMET Example
WCJP31 RJTD 090710
RJJJ SIGMET X03 VALID 090710/091310 RJTD-
RJJJ FUKUOKA FIR TC CHAN-HOM OBS AT 0600Z N2320 E12840 CB TOP FL520 WI 140NM OF CENTRE MOV NW 12KT NC FCST 1200Z TC CENTRE N2405 E12720=

Tropical Cyclone SIGMET (WC) Example
WCAU01 ABRF 071910
YBBB SIGMET D02 VALID 071915/080115 YBRF-
YBBB BRISBANE FIR TC SANDRA OBS AT 1800Z S1500 E15600 CB TOP FL500 WI 280NM OF CENTRE MOV NE 07KT INTSF

Cancellation
WCAU01 ABRF 100515
YBBB SIGMET D12 VALID 100515/100715 YBRF-
YBBB BRISBANE FIR CNL SIGMET D06 100115/100715=

Tropical cyclones Chan-hom and Nangka, 10 July 2015 from Himawari-8. Image courtesy of JMA.

Australian Government
Bureau of Meteorology

香港天文台
Hong Kong Observatory

CAA
Civil Aviation Authority of New Zealand

気象庁
Japan Meteorological Agency

Refer to the following for more information

ICAO *Annex 3 – Meteorological Service for International Air Navigation* (Amd 76)
ICAO *Regional SIGMET Guide*
ICAO Doc.8896 – *Manual of Aeronautical Meteorological Practice*
WMO No.49 *Technical Regulations Volume II – Meteorological Service for International Air Navigation* (2013 ed)
WMO No.732 *Guide to Practices for Meteorological Offices Serving Aviation*

20 August 2015

METEOROLOGY SUB GROUP WORK PROGRAMME

SUBJECT/TASKS LIST IN THE MET FIELD

Updated by MET SG/19

The priorities assigned in the list have the following connotation:
A = Tasks of a high priority on which work should be expedited;
B = Tasks of medium priority on which work should be under taken as soon as possible but not to the detriment of Priority "A tasks; and
C = Tasks of medium priority on which work should be undertaken as time and resources permit but not to the detriment of priority "A" and "B" tasks.
TOR = Terms of Reference of the Sub-Group

No.	Ref.	Associated Strategic Objective & GPIs	Task	Priority	Action Proposed/In Progress	Action by	Target Date
1 (32)	RAN/3 C.8/14 APANPIRG/14 (TOR 3)	A-Safety Sustainability GPI-19	Subject: Inadequate implementation of procedures for advising aircraft on volcanic ash (VA) and tropical cyclones (TC) and other hazardous weather Task: Monitoring of the implementation of meteorological advisories and warnings which includes VA and TC	A	Monitor and provide assistance in the implementation of meteorological advisories and warnings procedures to ensure provision of timely information on weather hazardous to aircraft. Monitor outcomes of ICAO global groups and WMO for developing framework of contingency plan for specific phenomenon including VA, TC, radioactive cloud and Tsunami for the Region (coordinate with ~~MET/R TF~~ MET/R WG and RACP/TF as necessary)	MET SG (~~MET/H TF~~MET/S WG)	On going

No.	Ref.	Associated Strategic Objective & GPIs	Task	Priority	Action Proposed/In Progress	Action by	Target Date
2 (36)	APANPIRG D. 4/46 RAN/3 C.12/3 APANPIRG 5/3 (TOR 3)	C- Sustainability All GPIs	Subject: Provision of adequate MET services Task: Monitor performance based systems research and development, trials and demonstrations in the fields of MET and facilitate the transfer of this information and expertise between States.	A	1) Encourage States to conduct R&D, trials & demonstrations of new MET services; 2) Monitor global developments that may have beneficial consequences on regional planning activities; 3) Consolidate information on new capabilities in the CNS/ATM system, for the Sub-Group's review and action; 4) Serve as a focal point for review of ongoing work of regional formal and informal working groups that is relevant to MET; 5) Provide for coordinated training/seminars to keep all States informed on developments of trials and demonstrations.	MET SG	On-going

No.	Ref.	Associated Strategic Objective & GPIs	Task	Priority	Action Proposed/In Progress	Action by	Target Date
3 (37)	C 12/24	C- Sustainability GPI-19	Subject : Transition to the GRIB and BUFR coded WAFS products Task : Implementation of the transition to the GRIB and BUFR coded WAFS products	A	1) Monitoring of implementation of BUFR coded SIGWX forecasts 2) Monitoring of the migration to SADIS 2G 3) Assist in preparation for the new gridded products for turbulence, icing and cumulonimbus 4) Monitoring of the implementation of WIFS until cessation of ISCS G2 broadcast	MET SG (WAFS TF) WAFS TF WAFS TF WAFS/I TF	Completed Completed Completed Completed
4 (38)	C12/36 APANPIRG C14/45	C- Sustainability GPI-19	Subject: Developing the new requirements for MET products and services in support of ATM	A	1) Development of the initial draft of the MET Chapter; 2) Development of the MET components of the CNS/ATM concept/ strategy; 3) Inclusion of ATM requirements for MET information in the CNS/ ATM Plan; 4) MET/ATM Coordination Seminar – February 2006. 5) Conduct survey on ATM requirements for MET	CNS/MET SG with assistance of MET WG on CNS/ATM Plan CNS/MET SG MET/ATM TF ~~MET/R TF~~ MET/R WG	Completed Completed Completed Completed ~~2014~~2016

No.	Ref.	Associated Strategic Objective & GPIs	Task	Priority	Action Proposed/In Progress	Action by	Target Date
					information 6) MET/ATM meeting in 2009 7) MET/ATM seminar in 2010 (in coordination with WMO) 8) MET/ATM seminar and MET/R TF meeting	 MET/ATM TF MET/ATM TF MET/R TF	 Completed Completed 2013 Completed 2015 Completed
5 (39)	APANPIRG/13 D 13/28	A - Safety C- Sustainability GPI-19	Subject: To increase the OPMET availability and reliability needed for flight planning (efficiency) and in-flight planning (safety) of the regional and inter-regional OPMET exchange from the ASIA/PAC Region Task: Review and optimize the ROBEX scheme and other OPMET exchanges; introduce monitoring and management procedures for the ROBEX centres and Regional OPMET data banks	A	1) Review regional guidance material related to OPMET data; 2) Identify gaps in processes, procedures and OPMET exchange; 3) Improve the availability of OPMET data at the Regional OPMET Data Banks (RODB) and WAFS Provider States; 4) Improve the timeliness and regularity of exchange; 5) Facilitate and monitor the migration to AIM and new MET codes (eg. XML); 6) Review the current RODB structure in light XML implementation	MET SG (~~ROBEX WG~~MET/IE WG)	Recurrent task Recurrent task Recurrent task Recurrent task ~~2014~~2015-2016 ~~2014~~2015-2016

No.	Ref.	Associated Strategic Objective & GPIs	Task	Priority	Action Proposed/In Progress	Action by	Target Date
6 (43)		C- Sustainability GPI17,18,19,22	Subject: Implementation of data link Task: Encourage implementation	A	Encourage States to implement CPDLC, D-ATIS, D-VOLMET, PDC and DPC	MET SG CNS SG	
7 (45)	APANPIRG List of deficiencies	A – Safety GPI - 19	Subject: Implementation of SIGMET Task: Improve regional procedures and availability of SIGMET from ASIA/PAC States	A	1) Assist States in implementing SIGMET requirements; 2) Conduct regular SIGMET tests; 3) Review and update training and guidance material; 4) Regular monitoring on the availability and quality of SIGMET and advisories.	MET SG (~~MET/H TF~~ MET/S WG in coordination with MET/IE WG ~~ROBEX WG~~)	Recurrent task Recurrent task Recurrent task Recurrent task

*** Number in bracket indicates sequential number since establishment of the Sub-group.**