



International Civil Aviation Organization

WORKING PAPER

TWENTY-FIRST MEETING OF THE METEOROLOGY SUB-GROUP (MET SG/21) OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION REGIONAL GROUP (APANPIRG)

Bangkok, Thailand, 29 May to 1 June 2017

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

- 6.1) Observations, reports, forecasts, advisories and warnings
(including MET/S WG Report)

REVIEW OUTCOMES FROM MET/S WG/7

(Presented by Chairman of MET/S WG)

SUMMARY

This paper presents the outcomes of the MET/S WG/7 meeting, including developments in SIGMET co-ordination among the States in the region, SIGMET guidance materials and weather forecasts for extreme Long Range Operations.

1. INTRODUCTION

1.1 The seventh meeting of the Asia/Pacific Meteorological Services Working Group (MET/S WG/7) was held in Bangkok, Thailand from 22 to 24 March 2017. The meeting was attended by 66 participants from 18 States and 2 International Organizations. Mr. Chan Pak Wai, Senior Scientific Officer, Hong Kong Observatory, Hong Kong, China, presided as Chair of the meeting and Mr. Peter Dunda, Regional Officer Aeronautical Meteorology, ICAO Asia and Pacific Office, acted as Secretary.

1.2 To assist the MET SG in its work programme to improve the quality of meteorological services, but in particular, observations, forecasts, advisories and warnings; including facilitating implementation of the international airways volcano watch (IAVW) and international tropical cyclone warning system, MET/S WG/7 adopted the following agenda:

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| Agenda Item 1: | Organizational matters |
| Agenda Item 2: | Review of follow-up from previous meetings |
| Agenda Item 3: | Planning and implementation of meteorological services |
| Agenda Item 4: | Quality management of meteorological services |
| Agenda Item 5: | Deficiencies in the provision of meteorological services |
| Agenda Item 6: | Guidance and education related to the provision of meteorological services |
| Agenda Item 7: | Future work programme and terms of reference |
| Agenda Item 8: | Any other business |

1.3 A conjoint session was held with the fifteenth meeting of the Meteorological Information Exchange Working Group (MET/IE WG/14) on 22 March 2017 to address issues common to both groups including the implementation of SIGMET information and volcanic ash/tropical cyclone advisory information.

1.4 MET/S WG/7 reviewed and updated its work programme, including actions completed since the previous meeting of the group (i.e., MET/S WG/6). This paper presents a summary of the outcomes from MET/S WG/7 for further review and action as necessary by MET SG/21.

2. DISCUSSION

2.1 A copy of the MET/S WG/7 meeting report, and all related meeting documentation, is available at the following website: <http://www.icao.int/APAC/Meetings/Pages/2017-METS-WG7.aspx>.

Outcomes from the conjoint session with MET/IE WG/15

2.2 The backup arrangement between VAAC Darwin and VAAC Tokyo was tested annually, in accordance with ICAO Doc 9766 — Handbook of the International Airways Volcano Watch (IAVW) – Appendix D. The updated work programme of the MET/IE WG included milestones and activities supporting coordination of the VAAC backup tests.

2.3 Results of the 2016 SIGMET tests were presented by the SIGMET test focal points, Singapore and Japan. Issues highlighted by the results included the continued shortfall in full participation by States in the SIGMET tests, inconsistent availability of the SIGMET test messages at the OPMET centres concerned, the persistence of some common formatting and coding errors in the SIGMET test messages disseminated by participants and the level of participation in the first phase of the SIGMET tests (for tropical cyclone) may have been limited in part due to the relatively short preparation time provided by the SIGMET test invitation letter.

2.4 The meeting also noted that RODB Nadi would provide data to support the analysis of all 3 phases of the SIGMET tests conducted 2017. The updated work programme of the MET/S WG included milestones and tasks supporting coordination of the review and follow-up of SIGMET test results.

2.5 Japan presented results of SIGMET monitoring conducted during July 2016, in accordance with the MET/S WG work programme, which highlighted some issues in common with those of the SIGMET test results (above), including level of availability of SIGMET messages and formatting and coding errors. The meeting noted that additional, careful examination of the SIGMET monitoring information would be necessary in order to conduct a detailed investigation of the issues.

Review of follow-up from previous meetings

2.6 There are two remaining action items from MET/H TF/5, which is the former task team of MET/S WG. One action item has finished, namely, action item 5/3 on the revision of all SIGMET pamphlets to align with the applicability of Amendment 77 to ICAO Annex 3. The other action item is still in progress, namely, action item 5/7 to confirm membership contact details and invite IATA and IFALPA to nominate experts for membership. It is noted that there were IATA representatives attending the MET/S WG/7.

2.7 Two action items arising from MET/S WG/6 are in progress, namely, task 6/1 to provide updates to MET WG and APANPIRG on the status of corrective action for the air navigation deficiencies in the MET field in the APANPIRG list, and task 6/2 to organize and conduct targeted SIGMET performance monitoring based on SIGMET-related air navigation/MET deficiencies in the APANPIRG list.

SIGMET co-ordination among the States in the region

2.8 The meeting noted that there were a number of efforts on SIGMET co-ordination among the States in the region. Such efforts aimed at reducing the deficiency of SIGMET issuance, e.g. consistency of SIGMET information across the boundaries of FIRs of the States.

2.9 Japan set up the second phase of a collaborative SIGMET issuance demonstration project as conducted in September 2016 in co-ordination with Lao PDR, Myanmar, Philippines, Thailand and Vietnam. There were plans for future demonstration projects in 2017 and 2018. The participating States indicated that the project was useful for improvements of SIGMET compliance.

2.10 Hong Kong China developed a web-based tool developed in support of the WMO SIGMET coordination pilot project (in SE Asia), which commenced in October 2016. A similar tool had also been developed by Japan. The user States of the tools, including Singapore, Indonesia and Malaysia, noted the web-based tool was very useful for coordinating SIGMET issuance across international FIR boundaries.

2.11 China was developing an aviation meteorological centre (referred to as AAMC) to provide information aimed at facilitating the issuance of SIGMET and the harmonization of SIGMET across FIR boundaries, as a collaborative effort of the Civil Aviation Administration of China (CAAC), China Meteorological Administration (CMA) and the Hong Kong Observatory (HKO). China was planning to provide the information to other States in the Region (i.e., MWOs and user groups) in an operational trial in 2018.

SIGMET guidance

2.12 Australia developed thunderstorm SIGMET criteria and used to support forecasters with the provision of (ICAO compliant) SIGMET information within the Australia FIRs. The criteria provide more objectivity and consistency in the approach to issuing SIGMET and were developed with consideration to CASA and FAA recommendations on thunderstorm avoidance. Such criteria would be used for the development of regional guidance material as part of the working group's work programme related to SIGMET Guide updates.

2.13 The MET/S WG also kept in view the international development of the guidance for issuing radioactive cloud SIGMET. In particular, the WG noted the use of a cylinder with a radius of 30 km centred at the radioactive release source for SIGMET message when detailed information on the release is not yet available.

2.14 A Regional SIGMET Guide update was presented in MET/S WG/7. This matter would be discussed separately in WP/XX in MET SG/21.

SIGMET deficiency

2.15 The MET/S WG/7 meeting noted that a monitoring activity had been formed in 2016 to study the provision of SIGMET from States with SIGMET-related deficiencies. The States concerned may wish to investigate whether further analysis of the results of the monitoring would support the case for removal of deficiencies from the list. Similarly, the States concerned may wish to consider whether the volcanic ash exercises conducted in the APAC Region by the VOLCEX/SG would provide suitable evidence to support the case for removal of deficiencies from the list.

2.16 In view of the above, under the request of MET/S WG, the Secretariat would consider providing an example for States on how to properly address the resolution of a listed air navigation deficiency in an official report to the Regional Office, as required by the APANPIRG procedures on the resolution of air navigation deficiencies. Details would be reported in WP/XX of MET SG/21.

Forecast for extreme long range operations

2.17 A proposal was presented by IATA for the provision of 30-hour validity TAF in the APAC Region, in accordance with ICAO Annex 3 provisions, to support planning for extreme Long Range Operations (LROPS), noting that international aerodromes are increasingly becoming destinations for LROPS. The MET/S WG/7 meeting noted that, based on the relevant ICAO provisions, the States are required to determine and provide meteorological service to meet the needs of international air navigation, in accordance with regional air navigation agreement, and that close liaison is maintained between the suppliers and users of meteorological information on matters which affect the provision of meteorological service for international air navigation. IATA agreed that a supplementary list of aerodromes where it considered 30-hour TAF was needed for international airline operations (in addition to the requirement for 30-hour TAF already expressed in the ANP) would be provided to MET/S WG for further consultation.

Future work programme

2.18 MET/S WG/7 reviewed and revised the terms of reference and work programme document. A copy of the revised terms of reference and work programme document of the MET/S WG is provided at the **Attachment 1** to this paper for further review and action as necessary by the MET SG. The updated task list from MET/S WG/7 is provided at the **Attachment 2** to this paper.

Any other business

2.19 **Next meeting** – MET/S WG/8 was tentatively scheduled for 21 – 23 March 2018, in Bangkok, Thailand, including a conjoint session with the MET/IE WG/16 on 21 March 2018.

3. CONCLUSION

3.1 The MET/S WG works towards the resolution of SIGMET deficiency in the region, including keeping in view the development of SIGMET co-ordination effort and monitoring the issuance of SIGMET, especially for those States with deficiencies. SIGMET guidance materials are also regularly updated to assist the States in the issuance of SIGMET, such as preparation of the Regional SIGMET Guide and keeping in view of the development of SIGMET guidance for tsunami and radioactive clouds.

4. ACTION BY THE MEETING

4.1 The meeting is invited to:

- a) Note the information in this paper; and
- b) Propose further updates to the terms of reference and work programme of MET/S WG, as necessary.

ATTACHMENT 1

ICAO ASIA/PACIFIC METEOROLOGICAL SERVICES WORKING GROUP (MET/S WG)

TERMS OF REFERENCE AND WORK PROGRAMME

1. WORKING GROUP MEMBERS

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(TBC) UNITED STATES	(TBC)	(TBC)
(TBC) VIETNAM	(TBC)	(TBC)

2. DESCRIPTION

Objective	Improve the quality of meteorological services, in particular, observations, forecasts, advisories and warnings – including facilitating implementation of the International Airways Volcano Watch (IAVW) and International Tropical Cyclone Watch (ITCW) – in support of the global air navigation plan framework and the aviation system block upgrade (ASBUs) methodology.
Benefits	Improve the safety and efficiency of flight and ground operations.
Terms of Reference	Under guidance from ICAO APAC MET Secretariat: <ol style="list-style-type: none"> 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); Promote the implementation of meteorological services; Promote the requirement for, and benefits of, QMS for MET services and competency of aeronautical meteorological personnel; Maintain awareness of, and identify new, meteorological deficiencies and formulate strategies to resolve these deficiencies; 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); Monitor the relevant activities of the MET Panel and appropriate bodies; and 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.
Work Program	<p>The work to be addressed by the ASIA/PAC MET/S WG includes:</p> <ul style="list-style-type: none"> • Review procedures for the issuance of meteorological observations, forecasts, advisories and warnings in the region and propose actions for their improvement to related performance objectives; • In conjunction with MET/IE WG, investigate the deficiencies in the format and dissemination of meteorological observations, forecasts, advisories and warnings and propose remediation plans; • Respond to the needs of the guidance and/or training related to the implementation of meteorological observations, forecasts, advisories and warnings and inform MET/IE WG of changes required to the SIGMET guide; • In conjunction with MET/R WG and in support of the ASBUs, provide meteorological input for operational planning for specific phenomenon including volcanic ash, radioactive cloud, tropical cyclone, tsunami and space weather; • Follow the developments in the States related to the improvement of meteorological observations, forecasts, advisories and warnings and provide regional input on these matters to relevant ICAO and WMO groups and to gather user requirements from ANSPs, IATA, IFATCA and IFALPA; • Investigate options for rectification of air navigation deficiencies in the field of meteorological services in APAC States; • Provide support for the ICAO APAC volcanic ash exercises; • Report on its work to the MET Sub-group of APANPIRG; and • Maintain a link to the Regional ATM Contingency Plan through the ATM SG.

3. COMMUNICATION STRATEGIES				
Description	Target Audience	Delivery Method	Frequency/ Date	Responsibility
Work Plan	Working Group Members	Document via email and posted on ICAO Bangkok website	As required but reviewed at least quarterly	Chair
General correspondence	Working Group Members	Email	As required	Working Group Members
Working Group Meeting	Working Group Members	Meeting in conjunction with MET/IE WG	Yearly in March	Chair
Status& Milestone Reports	ICAO Secretariat and Working Group Members	Report via email	Quarterly	Chair
Working Group Report	MET/S WG and MET/IE WG	Working Paper	Yearly	Chair
Working Group Report	MET SG	Working Paper	Yearly	Secretariat

4. PERFORMANCE FRAMEWORK FORM (PFF)				
Tasks	Time Frame	Responsibility	Status	Milestone
Task 1: Monitor and provide assistance to the regional implementation of meteorological observations, forecasts, warnings and advisories	2017-2019	MET/S WG	In progress	1
Task 2: Track and investigate deficiencies in the format and dissemination of meteorological observations, forecasts, warnings and advisories and propose corrective action and provide information to ICAO and WMO groups for possible assistance	2017-2018	MET/S WG and MET/IE WG	In progress	1,2
Task 3: Review WC, WV & WS SIGMET test results and implement improvements.	2017-2018	MET/S WG	In progress	1
Task 4: Provide guidance and/or training related to the implementation of meteorological observations, forecasts, warnings and advisories, including input to the Regional SIGMET Guide as they relate to the Annex 3 amendment cycle.	2017	R/O, MET/S WG and MET/IE WG	In progress	1,3
Task 5: Provide input into regional-operational plans as required for specific phenomenon, including VA, radioactive cloud, TC, Tsunami and Space Weather, with consideration to global	2017-2018	MET/S WG and MET/R WG	In progress	3

MET SG/21 – WP/11

Agenda Item 6.1

24/05/2017

ICAO groups and WMO developments.				
Task 6: Investigate, and implement as appropriate, options to assist States in resolving air navigation deficiencies in the field of meteorological service.	2017	MET/S WG	In progress	4
Task 7: Monitor the implementation and utilization of WAFS and training needs within the ASIA/PAC Region, and report to MET SG	2017-2019	MET/S WG	Recommend that this be suspended	
(New) Task 7: Initiate amendment proposal for ANP concerning regional requirements for 30-hour TAF based on information provided by IATA.	2017	Secretariat, IATA	To commence	5

5. MILESTONES			
Milestone	Accountability	Dates	Status
<i>Milestone 1: Report on SIGMET test results and regional performance to MET SG</i>	Chair	Annually	
<i>Milestone 2: Guidance and educational material available</i>	Chair	TBD	
<i>Milestone 3: MET input provided for ASIA/PAC Regional ATM Contingency Plans</i>	ad-hoc group	Next meeting	
<i>Milestone 4: Reduction in air navigation deficiencies in the field of meteorological service.</i>	States	TBD	
<i>Milestone 5: Conduct survey on the implementation and utilization of WAFS and training needs within the ASIA/PAC Region and report to MET SG</i>	Chair	Every 2 years	Recommend that this be suspended
<i>(New) Milestone 5: Amendment to APAC ANP Vol II (Table MET II-2) to reflect current requirements for provision of 30-hour validity TAF.</i>	States	2017	To begin

6. WORK PLAN				
Task / Milestone	Accountability	Predecessors	Date	Status
Activity 1: SIGMET TESTS				
Task 1.1: Review SIGMET tests (conjoint session with MET/IE WG)	Working Group	-	Annually	
Task 1.2: Develop action plan to fix identified deficiencies	Chair in conjunction with the Working Group	conjoint session with MET/IE WG	During meeting	
Task 1.3 Report back to MET SG on regional performance and action plan	Chair		Annually	
<i>Milestone 1: Report on SIGMET test results and regional performance to MET SG</i>	Chair	-	Annually	
Activity 2: GUIDANCE AND EDUCATIONAL MATERIAL				
Task 2.1: c) Review SIGMET pamphlets with regard to Annex 3 Amendment 77	Australia, Hong Kong, China, Japan and New Zealand (Rapporteur) in conjunction with ICAO HQ and WMO	-	August 2016	Done
Task 2.2: Monitor international development of radioactive cloud	China (Rapporteur), Hong Kong, China,	-	TBD	

6. WORK PLAN				
Task / Milestone	Accountability	Predecessors	Date	Status
SIGMET	Japan			
Task 2.3: Review the draft guidance of tsunami warning in line with Amendment 77 to Annex 3 and present the guidance to MET SG for endorsement	Japan (rapporteur), Australia, Indonesia		June 2016	Done
Task 2.4: Review the regional SIGMET Guide to be in line with Amendment 77 to Annex 3 New (specific task): Prepare proposal to include guidance on developing and using objective criteria supporting thunderstorm SIGMET issuance in the SIGMET Guide	Australia (rapporteur), Japan, Hong Kong, China and New Zealand in conjunction with Secretariat		2018	
<i>Milestone 2: Guidance and educational material available</i>	Chair		<i>TBD</i>	
Activity 3: REGIONAL CONTINGENCY PLANS				
Task 3.1: Get a list of requirements/consult with ATM SG to determine if this is still required	Secretariat	-	Next meeting	
<i>Milestone 3: MET input provided for ASIA/PAC Regional ATM Contingency Plans</i>	Secretariat ad-hoc group	3.1-3.2	<i>Next meeting</i>	
Activity 4 – SIGMET Deficiencies				
Task 4.1: Review options to eliminate SIGMET deficiencies-	ad hoc group #1: New Zealand (rapporteur), Australia, China, Japan, Indonesia, and Hong Kong, China		Sep 2016	Done
Task 4.2: Monitor the provision of SIGMET services from States with SIGMET deficiencies	ad hoc group #2: Australia, Japan (rapporteur), Singapore and Thailand, in conjunction with MET/S WG chair and Secretariat	4.1	May 2016 and Feb-Mar 2017	Done (July 2016) 2017 (to be coordinated with RODBs)
Task 4.3: Assist the ICAO Secretariat in the facilitation of discussion of viable options with relevant States.	ad hoc group #1	4.1	Ongoing	
Task 4.4: Monitor the implementation of the solution/s to remove deficiencies.	ad hoc group #1	4.2	Ongoing	
Task 4.5: Monitor global development on the establishment of a regional advisory system for hazardous weather.	ad hoc group #1		Ongoing	
Task 4.6: Report progress to MET SG	Rapporteur of ad hoc group #1	4.3	Ongoing	
<i>Milestone 4: Reduction in SIGMET deficiencies.</i>	<i>States</i>		<i>2017</i>	
(New) Activity 5 – Proposal to amend APAC ANP Volume II, Table MET II-2				
Task 5.1: Provide a list of regional requirements for 30-hour TAF	IATA	MET/S WG/7	Apr 2017	
Task 5.2: Draft a proposal to amend the ANP concerning regional requirements for 30-hour TAF based on information provided by IATA	Secretariat, IATA	5.1	Apr 2017	
Task 5.3: Ascertain whether the proposal has adequate support from the State/s affected	Secretariat	5.2	Apr 2017	

6. WORK PLAN				
Task / Milestone	Accountability	Predecessors	Date	Status
Task 5.4: Present outcomes of 5.1 to 5.3 for review by MET SG/21	Secretariat, IATA	5.3	May 2017	
Task 5.5: If supported, circulate the proposal to amend the ANP concerning regional requirements for 30-hour TAF	Secretariat	5.4	After May 2017	
<i>Milestone 5: Conduct survey on implementation and utilization of WAFS (including SADIS and WIFS services) and training needs within the ASIA/PAC Region and report to MET SG</i>	<i>MET/S WG chair</i>	<i>5.1 – 5.5</i>	2-yearly	

ATTACHMENT 2

TASK LIST

MET/H TF/5

Action item	Description	By date	Responsibility	Status/Remarks
5/3	Revise all SIGMET pamphlets as necessary, and submit drafts for approval, to align with, in time for the applicability of, Amendment 77 to ICAO Annex 3.	August 2016	Ad-hoc group, comprising Australia, Hong Kong-China, Japan and New Zealand (Rapporteur)	COMPLETED Related to MET/H TF/5 Decision 5/1 http://www.icao.int/APAC/Pages/edocs.aspx
5/7	Confirm the MET/H TF membership contact details and invite IATA and IFALPA to nominate relevant experts for membership.	June 2016	Secretariat	IN PROGRESS Related to MET/H TF/5 Decision 5/4

MET/S WG/6 – Adapted from the Report of MET/S WG/6

Task	Description	By date	Responsibility	Status/remarks
6/1	Provide updates to MET SG and APANPIRG on the status of corrective action for the air navigation deficiencies in the MET field in the APANPIRG list	Jun 2017	Members, Secretary	TO BEGIN [Ref: MET/S WG/6 Report para. 5.5]
6/2	Organise and conduct targeted SIGMET performance monitoring based on SIGMET-related air navigation/MET deficiencies in the APANPIRG list	Jun 2016	Members, Secretary	COMPLETED (July 2016) [Ref: MET/S WG/6 Report para. 5.7]

(Highlighted text indicates updated information)

CONJOINT SESSION OF ROBEX WG/13 AND MET/H TF/5

ACTION ITEM	DESCRIPTION	TIME FRAME	RESPONSIBLE PARTY	STATUS/REMARKS
1	Review and update, as necessary, the distribution list for the VAAC back-up test State letter invitations and supporting documentation.	Jun 2015	Secretariat in consultation with VAACs and States	ON HOLD Related to Decision (ROBEX WG/13-MET/H TF/5)/1
2	Review and update the lists of AFTN addresses used for MWOs and ACCs in VAAC back-up tests, including in VAAC Wellington's area of responsibility.	Jun 2016	Secretariat in consultation with VAACs and States	IN PROGRESS Related to Decision (ROBEX WG/13-MET/H TF/5)/2
8	Consider the promotion of the issuance of special air-reports to support information sharing, especially with respect to hazardous phenomena, in a consistent manner as required throughout the Region.	Jun 2016	Secretariat in consultation with IFALPA	TO COMMENCE Related to Decision (ROBEX WG/13-MET/H TF/5)/8

CONJOINT SESSION OF MET/IE WG/14 AND MET/S WG/6

TASK	DESCRIPTION	BY DATE	RESPONSIBILITY	STATUS/REMARKS
1	Report on follow-up related to APANPIRG Conclusion 26/53	Jun 2016	Secretary	COMPLETED [Ref: Conjoint Session Report para. 1.3; MET Panel 2, Recommendation 8/2; Draft Amendment 78 to Annex 3/ Technical Regulations [C.3.1] concerning Table A2-2 Template for advisory message for tropical cyclones and Table A6-1A Template for SIGMET and AIRMET messages]
2	Promulgate results of the 2015 SIGMET test to States concerned	Jun 2016	Secretary	TO BEGIN [Ref: Conjoint Session Report para. 2.12; MET/IE WG work programme Activity 3.9]
3	Prepare draft amendment to the APAC Regional SIGMET Guide to align with Amendment 77 to Annex 3.	Jun 2016	Chairs, Secretary	IN PROGRESS [Ref: Conjoint Session Report para. 2.16; MET/S WG/7 WP/06]

(**Highlighted** text indicates updated information)
