



International Civil Aviation Organization

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

Bangkok, Thailand, 3 – 6 August 2015

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

6.4) OPMET exchange (including ROBEX WG Report)

ROBEX WORKING GROUP REPORT

(Presented Chair of ROBEX WG)

SUMMARY

This paper presents a summary of the thirteenth meeting of the Regional OPMET Bulletins Exchange Working Group (ROBEX WG) of the Meteorology Sub Group (MET SG) of the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), held in Seoul, Republic of Korea from 16 to 18 March 2015. It includes the agreed actions and work plan of the group.

1. Introduction

1.1 The Thirteenth Meeting of the Regional Operational Meteorological (OPMET) Bulletin Exchange Working Group (ROBEX WG/13) was hosted by the Korea Aviation Meteorological Agency/Korea Meteorological Administration (KAMA/KMA) and held in Seoul, Republic of Korea, from 16 to 18 March 2015. A conjoint session was held on 18 March 2015 with the Fifth Meeting of the Meteorological Hazards Task Force (MET/H TF/5) to address issues common to both groups related to the implementation of SIGMET and advisory information.

1.2 The meeting was attended by 40 experts from Australia, Bangladesh, Bhutan, Cambodia, China, Hong Kong China, Indonesia, Japan, Malaysia, Philippines, Republic of Korea, Singapore, Thailand, Vietnam, IATA, IFALPA and ICAO.

1.3 Mr. Tim Hailes presided over the meeting in the role as chairperson and was assisted by Mr Peter Dunda, ICAO RO Met, as secretariat. During the conjoint session Mr. Chan Pak Wai, chairperson of the MET/H TF, and Mr Hailes were co-chairs.

1.4 The full report of the ROBEX WG/13 can be accessed at the following website: <http://www.icao.int/APAC/Meetings/Pages/2015-ROBEX-WG13.aspx>. Agreed actions for ROBEX WG/13 and the conjoint session are contained in Appendix B of this paper.

2. Follow-up of

2.1 **ROBEX WG/12 agreed action:** The meeting reviewed progress on the 14 actions from ROBEX WG/12. With the exception of action relating to the construction of a test dataset by the Regional OPMET Data Banks (RODBs) to support standardised OPMET exchange verification and validation, all actions were in progress or completed. A table of the follow-up of ROBEX WG/12 agreed action is in Appendix A to this paper.

2.2 **MET SG/18 and APANPIRG/25 agreed action:** The meeting reviewed follow-up from MET SG/18 and APANPIRG/25 relevant to ROBEX WG. There was no specific action taken in response to these decisions and conclusions except with regard to MET SG/18 Decisions 18/5 and 18/10, where it was agreed that the approval officials for each State WIFS accounts would be available by the ICAO website (Decision 13/1).

3. OPMET information

3.1 **OPMET Availability:** The meeting reviewed results of International Air Transport Association's (IATA's) monitoring of availability of non-scheduled OPMET (SIGMET and Volcanic Ash & Tropical Cyclone Advisories) data from the APAC Region on Satellite Distribution System (SADIS) and WAFS Internet File Service (WIFS) over a period of 4 days. The results were useful at highlighting issues where the data was only available at one of the two sources (SADIS or WIFS). It was agreed that the IATA monitoring could also be of use in conjunction with SIGMET test data to help identify issues with SIGMET generation and distribution. Future IATA monitoring could also be targeted to monitor seasonal variations and SIGMET-deficient areas.

3.2 The meeting also reviewed results of comparison monitoring between SADIS and WIFS of scheduled OPMET (METAR and TAF) data over a period of 9 weeks. The meeting noted a number of locations identified in the results where OPMET data was not available at either SADIS or WIFS, or in some cases, both. To address this issue the ROBEX Handbook should be updated and an analysis of the data be provided to States where there are seen to be issues.

3.3 The meeting reviewed the results of OPMET monitoring carried out by RODBs Bangkok and Brisbane, Nadi, Singapore and Tokyo during January 2015. The meeting was pleased to see Nadi contribute data for the first time in several years and thanked Australia for assisting Nadi to collect the data.

3.4 The rate of issuance of TAF and METAR in the APAC Region was overall quite high (e.g., TAF were received from 97% of expected locations; METAR were received from 94% of expected locations), with significant improvement recorded in the availability of METAR in the Asia Region on the previous year's results (i.e., availability of METAR from locations listed in AOP increased from 93% to 96%; not listed in AOP increased from 86% to 91%), though the reception of OPMET from some locations remained poor (e.g., TAF were not received from 10 expected locations and METAR were not received from 19 expected locations). The rate of issuance of TAF and METAR significantly improved in our region but there are some States with continued poor availability of OPMET data for some airport locations. For standardisation reasons and to simplify the analysis, it was recommended that the SA (METAR) and FT (TAF) bulletins be aligned.

3.5 In order to make optimal use of the monitoring results, a comprehensive comparison of the reports from the RODBs (and IATA) was added the ROBEX WG work programme. The practice of using the SADIS User Guide or FASID Tables MET as the baseline reference should also be clarified to ensure comparability of the results (Decision 13/2).

3.6 The meeting noted that OPMET data received as Aeronautical Message Handling System (AMHS) messages (as opposed to Aeronautical Fixed Telecommunication Network (AFTN) messages) was problematic for the monitoring exercise due to the potential inability of RODBs monitoring applications to process AMHS messages. RODB Bangkok will notify the group of any requirement to modify their monitoring system in order to accept AMHS message format from all RODBs rather than require all RODBs to undertake the change.

3.7 The ROBEX WG will review the SADIS User Guide, MET FASID Tables and the ROBEX Handbook to ensure consistency.

4. OPMET exchange

4.1 **IROG Back-up tests:** Back-up testing between IROG Singapore and IROG Bangkok conducted on 13 February 2015 was successful with 100% success rate of the backup messages. The meeting also noted the issues that occurred due to multiple, duplicated OPMET bulletins received from the MID Region during the test, were adequately managed but did cause delays in the processing of messages at times.

4.2 **OPMET Bulletins:** Australia advised of proposed changes to its OPMET bulletins to make them more compliant with ICAO provisions, regional air navigation agreements and the ROBEX Handbook procedures. In particular, expected improvement with respect to the compliance of priority codes in SIGMET messages.

4.3 Australia also proposed a range of changes to its FT bulletins as a result of changes to its TAF services. The meeting recommended that these changes be effective 30th April 2015. The issuance time of the TAF (as per Annex 3) should be no earlier than one hour prior to the commencement of the validity time and should be between 30-60 minutes in APAC. As such, the meeting agreed that the TAF bulletin filing time should be 25 minutes prior to validity time. Amendments to the ROBEX Handbook and APAC Electronic Air Navigation Plan (eANP) will be made accordingly (Decision 13/3).

4.4 **OPMET QMS:** The meeting reviewed the quality control system for METAR production implemented in the Republic of Korea in order to reduce errors in METAR messages.

4.5 **Digital exchange of OPMET:** The meeting reviewed Republic of Korea, Australia, Thailand, Singapore and Japan's plans and progress towards implementation of OPMET exchange in ICAO Meteorological Information Exchange Model (IWXXM) format. Singapore also provided additional details of the IWXXM exchange testing that was conducted in March 2015. In order to maintain optimal regional exchange of OPMET data a coordinated approach to the implementation of IWXXM within the ROBEX scheme needs to be adopted. The meeting requested the Secretariat to seek similar information from Fiji with respect to the status of planning for implementation of IWXXM by RODB Nadi.

4.6 An inter-regional capacity building workshop to support the implementation of digital exchange of meteorological information in IWXXM format for the Asia/Pacific and other ICAO Regions has been proposed. (Conclusion 13/4)

4.7 The meeting was informed that the European Data Management Group has been developing a Concept of Operations for the Transition of OPMET Data Exchange using IWXXM to enable System Wide Information Management (SWIM), which may be adopted later in 2015 as guidance material for European Region and possibly other Regions to support planning and implementation of digital OPMET exchange.

4.8 The meeting also envisaged that, as IWXXM exchange of OPMET data is implemented, the compliance (of OPMET format) to ICAO standards will remain of critical importance in order to mitigate potential failure or delay in the conversion of OPMET (from TAC to digital) format (which would pose potential safety implications to users) and to ensure the transmission and global availability of the data. The meeting also felt that further information on the current status of planning and implementation should be presented to MET SG (Decision 13/5).

5. Guidance material

5.1 The meeting was informed that Indonesia has a number of changed location indicators which will be published in ICAO Location Indicators (Doc 7910). The new location indicators will require an update to the ROBEX Handbook OPMET bulletin tables.

5.2 The meeting reviewed a draft amendment to the ROBEX Handbook and draft updates to the Asia/Pacific OPMET Data Banks Interface Control Document (ICD), which were intended for publishing soon after the meeting's review to realign the guidance material with current regional requirements. The meeting provided several additional necessary updates to bring the documents into alignment and to reflect current regional requirements (Decision 13/6).

5.3 The meeting reviewed progress on development of the MET section of the draft new electronic Asia/Pacific eANP. The meeting provided the following additional suggestions for the final review of the draft material by the MET SG/19 meeting in August 2015 prior to submission to APANPIRG/26:

- In VOL II, 2.2: the issuance of METAR at intervals of one half hour should be maintained in the text for locations that agree to do so;
- In VOL II, 2.5: consideration should be made for the inclusion of provisions for 12- and 18-hour TAF (to reflect current requirements in the ROBEX Handbook);
- In VOL II, 2.8: provisions for AIRMET should be maintained in the text for locations that agree to do so; and
- In VOL II, 2.8: consideration should be made with respect to the most appropriate naming convention for OPMET centres in the Region (e.g., international OPMET databanks or regional OPMET databanks).

5.4 The meeting was advised that some States now issue TAF every three (3) hours. Noting that the ANP and ROBEX Handbook only include provisions for the issuance of TAF at intervals of six (6) hours, the meeting requested the Secretariat investigate feasibility of including provisions in the regional guidance material related to the issuance of routine TAF at intervals of three (3) hours (Decision 13/7).

6. VAAC back-up tests

6.1 A back-up test was conducted between the Volcanic Ash Advisory Centres (VAACs) Tokyo and Darwin on 22 October 2014. The following recommendations were made:

- a) That VAACs Tokyo and Darwin use email as a main source of communication with an online version of the proforma. When email is not available, fax is to be used. If no response is received within 10 minutes make a phone call for a reminder.
- b) That VAACs Tokyo and Darwin continue to promote the implementation and understanding of the IAVW, through active engagement with regional MWOs.
- c) That VAACs use test results to identify the necessity to update the AFTN addresses for its VAA provision.
- d) That the VAACs continue to conduct annual back-up testing.

6.2 With respect to the somewhat poor response rate from intended participating units to the back-up test messages sent by the VAACs concerned, the Secretariat agreed to coordinate the review and update of the email distribution list for the VAAC back-up test State letter invitations. The Secretariat will also continue to coordinate with VAACs and States to ensure the correct AFTN addresses are used for the participating MWOs and ACCs in VAAC back-up tests.

7. SIGMET and advisory information

7.1 **SIGMET Tests:** The meeting reviewed the [WS] SIGMET test for phenomena other than tropical cyclone and volcanic ash conducted on 19 November 2014, the [WV] SIGMET test for volcanic ash conducted on 12 November 2014 and the [WC] SIGMET test for tropical cyclone conducted on 5 November 2014. The overall participation rate of APAC States had increased considerably on the previous year: WS SIGMET test = 76% (up by 10%); WC SIGMET test = 83% (up by 11%); and WV SIGMET test = 85% (up by 19%). For the first time test SIGMET messages were received for Nauru, Solomon Islands and Papua New Guinea.

7.2 The meeting also noted that the average rate of reception of the WS SIGMET test messages across all five RODBs (92%) and across the three EUR ROCs (85%) was 6% lower than the previous year. The reception rate of WS SIGMET test messages was different at all five (5) RODBs; ranging from 87% to 100%. While the reason for the variation was not shown in the analysis, the meeting noted that, in accordance with the Regional SIGMET Guide and the ROBEX scheme, the dissemination of all SIGMET messages should be to all five RODBs.

7.3 In order to address the inconsistencies in SIGMET availability at RODBs and to resolve other issues such as non-participation of MWOs in the SIGMET tests and format errors in TEST SIGMET messages, the meeting agreed that the analysis could be used to highlight the particular problems with the individual States/MWOs concerned.

7.4 Japan advised that it was considering hosting a WMO RAI SIGMET workshop to assist States in 2016 and this could also likely be attended by other States from our region.

7.5 The meeting noted the repetition of errors at some locations from one year to the next and agreed that the tabulated presentation of SIGMET test errors would be helpful for States concerned.

7.6 **SIGMET Guide:** The meeting reviewed the draft amendment to the APAC Regional SIGMET Guide. The meeting suggested and agreed to several additional changes and the revised draft will be given a final review by an ad hoc group to ensure completeness of the changes agreed before the final approval process and dissemination to States for use as guidance. With regard to cases where regional guidance material prepared by APANPIRG contributory bodies needs to be dealt more

speedily, the material may be circulated to States for appropriate action following consultation with the APANPIRG Chairperson and examination by ICAO Headquarters.

7.7 **Advisory Information:** The meeting noted information in the VAAC Darwin Management Report, which addresses the main features of the IAVW operations, highlighting recent developments and difficulties and future planned developments. Hong Kong, China also expressed support for Australia's initiatives with respect to sharing operationally relevant information via the internet and social media sites and suggested that Australia could make the Volcano Observatory Notice for Aviation (VONA) information accessible to users in the same manner.

7.8 The meeting noted outcomes of the volcanic ash exercise conducted in Kamchatka (far-east Russian Federation) in 2014, known as VOLKAM14, and the objectives of VOLKAM15 to be conducted on 15-16 April 2015. APANPIRG/25 recently decided to establish a volcanic ash exercises steering group in the Asia/Pacific and to conduct a volcanic ash exercise/s in the Region in 2015.

7.9 The meeting also noted the ongoing efforts between Japan and United States to enhance the handover procedures for volcanic ash advisory service between the VAAC Anchorage and VAAC Tokyo and the associated Collaborative Decision Analyses and Forecast (CDAF).

7.10 A number of inconsistencies in the guidance for the tropical cyclone advisory and SIGMET were discussed. These include:

- a) information on the radius and vertical extent of cumulonimbus cloud associated with a tropical cyclone which is required in a SIGMET message but not provided in an associated tropical cyclone advisory message;
- b) information on the change in intensity of a tropical cyclone is required in a SIGMET message (e.g., INTSF, WKN or NC) but can only be inferred from, but not explicitly provided, an associated tropical cyclone advisory message;
- c) the time of origin (DTG) of a tropical cyclone advisory message is the issue time (Annex 3 Table A2-2) whereas it is generally understood that the TCACs currently take this to mean the observation time (noting the volcanic ash advisory message has separate DTG for issuance time and observation time);
- d) description of the position of a tropical cyclone at the end of the validity of a SIGMET when the SIGMET end time does not coincide with a forecast time/position given in a corresponding tropical cyclone advisory message; and
- e) SIGMET messages in situations where the area of cumulonimbus cloud is displaced significantly from the centre of a tropical cyclone (or confined to just one sector of the cyclone).

7.11 The meeting agreed to support a review of ICAO guidance and provisions with respect to the issues discussed above and tasked an ad hoc group, comprising Australia (rapporteur), Hong Kong-China and Japan (note: Secretariat to invite India) to develop a paper with a draft conclusion for APANPIRG to invite ICAO to review the provisions and guidance for improved clarity and consistency of advisory messages and to support effective implementation of consistent information within tropical cyclone advisory and SIGMET information in the Region.

7.12 TCAC Tokyo is changing the issuance of tropical cyclone advisories to intervals of 3 hours – to support the provision of [WC] SIGMET which are also issued at intervals of 3 hours when tropical cyclones affect the congested airspace over Japan or are rapidly moving in the vicinity of Japan. The proposed increase in frequency of issuance of tropical cyclone advisories may result in an increase in the likelihood of requiring an advisory number of 100 or more, which is beyond the current limit defined in Annex 3 Table A2-2, which specifies the advisory number shall be set to two (2) digits. Japan will raise this with the Meteorology Panel and it will also be considered by the ad hoc group. Japan will also commence issuing TCG in the portable network graphics (PNG) format in August 2015.

7.13 The meeting reviewed a presentation, based on the severe turbulence encounter of flight AA280 over Japan in December 2014. It also noted the abundance of air-reports received and invited IFALPA to promote the issuance of special air-reports in other parts of the Region.

8. Review of Work Programme

8.1 **Review of the Work Programme:** The TORs, detailed work programme and composition of the group were reviewed and updated as detailed in the Appendix C. The changes included:

- Changes to group members (Japan);
- Specific references to IWXXM and AMHS throughout the workplan;
- New milestone and associated tasks for the improved efficiency and effectiveness of ROBEX scheme; and
- Updates to the timing of various tasks.

9. Next Meeting

9.1 Given that 2016 is an ICAO Assembly year, APANPIRG will be brought forward to July 2016 so its Sub-Group meetings will need to be conducted before June 2016. It was agreed that the tentative dates for MET/H TF/6 and ROBEX WG/14 would be in the week commencing 7 March 2016.

10 Action by the Meeting

10.1 The meeting is invited to:

- a) note the information contained in this paper;
- b) provide updates to the list of agreed actions; and
- c) formulate actions as appropriate.

APPENDIX A
FOLLOW-UP OF ROBEX WG/12
AGREED ACTION
 11 March 2015
 ✓ = completed

No.	Title/description	Follow-up action (target/completion dates in brackets)
12/1	<p>Improvement of OPMET availability on SADIS and WIFS</p> <p>Identify and address issues where OPMET availability on SADIS and WIFS did not meet the requirements of IATA.</p>	<p>RODBs in coordination with the Secretariat to investigate the results of IATA OPMET monitoring (on SADIS and WIFS) and address issues such as incorrect distribution lists or misalignment of requirements in the FASID Table MET 2A. Secretariat to coordinate with States to address the issues related to specific locations (June 2014). IN PROGRESS; Proposals for follow-up on OPMET availability issues provided for further consideration by ROBEX WG/13 in WP/10 (presented by Secretariat).</p>
12/2	<p>Facilitating the implementation of digital exchange in the APAC Region</p> <p>Report on the activities, plans and identified implementation issues with respect to the exchange of OPMET in a digital form.</p>	<p>Secretariat to coordinate with States a comprehensive report of the activities, plans and identified implementation issues with respect to the exchange of OPMET in a digital form for the next meeting of the MET SG (June 2014). IN PROGRESS; MET SG/18 considered WP/18 (presented by Secretariat), IP/22 (presented by United States) and IP/26 (presented by Australia). Further discussion is provided for ROBEX WG/13 in IP/4 (presented by ROK), WP/12 (presented by Australia), IP/6 (presented by Thailand), IP/7 (presented by Singapore) and WP/14 (presented by the Secretariat).</p>
12/3	<p>Verification and validation of the exchange of OPMET</p> <p>Verify and validate the exchange of OPMET in the APAC Region using a set of test data.</p>	<p>RODBs to construct a test dataset, perform calculations, compare results and to standardize (report to next meeting).</p>
12/4	<p>ROBEX Handbook updates</p> <p>Develop and publish updates to the ROBEX Handbook.</p>	<p>Ad-hoc group comprising RODB experts to progress the required ROBEX Handbook updates as discussed under agenda item 5 of the Report; Secretariat to publish the updates (June 2014). IN PROGRESS; ROBEX Handbook updates for consideration by ROBEX WG/13 provided in WP/15 (presented by Secretariat).</p>

No.	Title/description	Follow-up action (target/completion dates in brackets)
12/5	<p>ICD updates</p> <p>Develop and publish updates to the ICD.</p>	<p>RODBs to provide updates for their respective appendices in the ICD; Secretariat to publish the updates (June 2014).</p> <p>IN PROGRESS; ICD updates for consideration by ROBEX WG/13 provided in WP/16 (presented by Secretariat).</p>
12/6	<p>Requirement for aerodrome forecasts in TAF code in FASID Tables MET 1A and MET 2A</p> <p>Verify the inclusion of TAF with validity 9 hours and 18 hours in the explanation of the FASID Tables MET 1A and MET 2A.</p>	<p>Secretariat to determine whether an appropriate amendment proposal would be required to remove references to 9 hours and 18 hours validity TAF in the FASID Tables MET 1A and MET 2A (June 2014).</p> <p>✓</p> <p>This should be considered in the adoption of the new eANP based on the new ANP template approved by the Council, which includes provisions in Vol II, Part V (MET), 2.5 for TAF of 9-, 24- and 30-hour validity, and in Table MET II-2 for TAF of 9-, 18/24- and 30-hour validity. As amendment of Vol II does not require approval by the Council, the removal of references to 9- and 18-hour TAF have been included in the draft APAC eANP for consideration by ROBEX WG/13 in WP/17 (presented by Secretariat).</p>
12/7	<p>Review of FASID Table MET 6</p> <p>Review FASID Table MET 6 for possible inconsistencies in the requirements specified for Malaysia.</p>	<p>Secretariat to ensure the latest version of FASID Table MET 6 reflects current requirements (June 2014).</p> <p>✓</p> <p>FASID Table MET 6 (updated 28/03/2014) reflects current requirements for WIFS in Malaysia as the primary Internet-based service for the provision of WAFS and OPMET information.</p>
12/8	<p>Updates to ROBEX Handbook</p> <p>Update the ROBEX Handbook to realign with amendments to FASID Tables MET 1A and MET 2A with respect to locations in Indonesia.</p>	<p>Secretariat to include updates to realign the ROBEX Handbook with amendments to FASID Tables MET 1A and MET 2A with respect to locations in Indonesia are included in the ROBEX Handbook updates (Agreed Action 12/4 refers) (June 2014).</p> <p>IN PROGRESS; ROBEX Handbook updates for consideration by ROBEX WG/13 provided in WP/15 (presented by Secretariat).</p>

No.	Title/description	Follow-up action (target/completion dates in brackets)
12/9	<p>Amendment to FASID Tables MET 1B, MET 3A and MET 3B</p> <p>Amendment to FASID Tables MET 1B, MET 3A and MET 3B concerning MWOs Cairns and Townville.</p>	<p>Secretariat in coordination with Australia to develop and process an amendment proposal to FASID Tables MET 1B, MET 3A and MET 3B concerning MWOs Cairns and Townville (June 2014).</p> <p>IN PROGRESS; draft proposal for amendment of FASID provided in WP/17 (presented by Secretariat) for endorsement by the group.</p>
12/10 (MET/H TF 4/1)	<p>SIGMET Guide/VAAC back-up test procedures</p> <p>VAAC back-up test procedures between Wellington and Darwin to be included in the next amendment or edition of the APAC Regional SIGMET Guide</p>	<p>Secretariat to include VAAC back-up test procedures in SIGMET Guide</p> <p>(Target date TBD in 2014, in coordination with ad-hoc group's revision of SIGMET Guide for presentation to MET SG/18)</p> <p>IN PROGRESS; SIGMET Guide updates for consideration by conjoint session of ROBEX WG/13 and MET/H TF/5 provided in WP/C5 (presented by Secretariat).</p>
12/11 (MET/H TF 4/2)	<p>SIGMET Guide/SIGMET test procedures</p> <p>a) List of WMO headings for SIGMET bulletins used by APAC MWOs (to be used for compilation of SIGMET test results) to be updated to reflect the limitations in WC SIGMET issuance from certain MWOs as notified by States in the next amendment or edition of the APAC Regional SIGMET Guide; and</p> <p>b) Specific guidance for the issuance of test WC/WV SIGMET when a test advisory message for tropical cyclone/volcanic ash is not received to be included in the SIGMET test procedures in the next amendment or edition of the APAC Regional SIGMET Guide.</p>	<p>Secretariat to include (a) updated information on WC SIGMET issuance and (b) specific guidance for non-receipt of test advisory messages in SIGMET tests in SIGMET Guide</p> <p>(Target date TBD in 2014, in coordination with ad-hoc group's revision of SIGMET Guide for presentation to MET SG/18)</p> <p>IN PROGRESS; SIGMET test procedures (circulated 15/10/2014).</p> <p>SIGMET Guide updates for consideration by conjoint session of ROBEX WG/13 and MET/H TF/5 provided in WP/C5 (presented by Secretariat).</p>
12/12 (MET/H TF 4/3)	<p>SIGMET test results</p> <p>a) ICAO State letter urging States to resolve the errors identified in the 2013 SIGMET tests (reported by Japan and Singapore and provided in Attachments C3 and C4 to the Report); and</p> <p>b) States to advise ICAO on any issues that cannot be resolved or require further coordination/assistance to address the SIGMET test errors.</p>	<p>(a) Secretariat to issue State letter (April 2014)</p> <p>(b) States respond if necessary (June 2014)</p> <p>IN PROGRESS; SIGMET test errors from 2013 SIGMET tests (reported by Japan and Singapore) now presented for consideration by conjoint session of ROBEX WG/13 and MET/H TF/5 in WP/C4 (presented by Secretariat) and may be circulated to States with errors from 2014 SIGMET tests.</p>

No.	Title/description	Follow-up action (target/completion dates in brackets)
12/13 (MET/H TF 4/4)	<p>Proposal for amendment of FASID Table MET 1B – Cairns (YBCS)</p> <p>Update the regional air navigation plan, FASID Table MET 1B, to remove the requirement for MWO services at Cairns (YBCS) – in line with current requirements.</p>	<p>Secretariat (in coordination with Australia) to prepare and process the PfA (June 2014) IN PROGRESS; draft proposal for amendment of FASID provided in WP/17 (presented by Secretariat) for endorsement by the group.</p>
12/14 (MET/H TF 4/5)	<p>Draft Asia/Pacific Regional SIGMET Guide (5th Edition)</p> <p>Comprehensive revision of the draft Asia/Pacific Regional SIGMET Guide (5th Edition) based on the suggested changes in Attachments C5, C6 and C7 to the Report.</p>	<p>Ad-hoc group comprising Australia (Rapporteur), Hong Kong-China, Japan, New Zealand and ICAO to produce the revised draft Asia/Pacific Regional SIGMET Guide (5th Edition) and forward to the Secretariat for inter-regional coordination then to the MET SG for further consideration (June 2014). IN PROGRESS; SIGMET Guide updates for consideration by conjoint session of ROBEX WG/13 and MET/H TF/5 provided in WP/C5 (presented by Secretariat).</p>

APPENDIX B
FOLLOW-UP OF ROBEX WG/13
AGREED ACTION (THIS NEEDS TO BE UPDATED)

Status on **18 March 2015**
(✓ = completed)

No.	Title/description	Follow-up action (target/completion dates in brackets)
13/1	Contact information for approving officials for WIFS accounts That, the contact details for WIFS accounts and approving officials in the APAC Region be made available to stakeholders via the ICAO website in order to better facilitate the administration of WIFS accounts.	Secretariat to post the list of WIFS accounts and approving officials in the APAC Region on the ICAO Regional Office web site (http://www.icao.int/apac/pages/default.aspx), e.g., with a link to APAC eDocuments. (June 2015)

No.	Title/description	Follow-up action (target/completion dates in brackets)
13/2	<p>Standardization and optimization of OPMET monitoring and presentation of the results</p> <p>That, in order to support improved OPMET availability and reliability in the Asia/Pacific Region, the guidance for OPMET monitoring should be revised to:</p> <p>a) Ensure the frequency at which OPMET messages are monitored is in alignment with the OPMET issuance times required by regional agreement (e.g., the frequency of issuance of [routine] METAR is one hour and TAF is six hours);</p> <p>b) Enable future OPMET monitoring exercises (e.g., in 2015/2016) to include the monitoring of SIGMET issuance, which may target specific problems such as seasonal/geographical phenomena (e.g., tropical cyclone) and known ‘SIGMET-deficient’ areas;</p> <p>c) Provide additional data in OPMET monitoring reports such as the actual number of messages received per day at locations where OPMET availability is considered not satisfactory (i.e., where the number of messages received does not meet a given threshold for the number of messages expected);</p> <p>d) Encourage easily comparable and interpretable data and presentation of results in the OPMET monitoring reports from the various OPMET monitoring entities (i.e., IATA and RODBs); and</p> <p>e) Clarify the baseline list of locations to which OPMET monitoring should be applied (i.e., SADIS User Guide or FASID Tables MET).</p>	<p>Secretariat is preparing draft revisions to the guidance for OPMET monitoring (e.g., in the ROBEX Handbook and IATA OPMET monitoring practices) will be presented to MET SG/19 (Aug 2015)</p>

No.	Title/description	Follow-up action (target/completion dates in brackets)
13/3	<p>Alignment of ROBEX OPMET bulletins</p> <p>That, consideration be given to the realignment of corresponding bulletins for the collection and dissemination of METAR (SA) and TAF (FT) under the ROBEX scheme, with respect to the composition of locations in the bulletins (i.e., corresponding SA/FT bulletins should consist of OPMET from the same set of locations), in order to facilitate the comparison and interpretation of results of monitoring exercises based on the OPMET bulletins.</p>	<p>Secretariat and ROBEX WG is preparing updates to bulletins which will be presented MET SG/19 (Aug 2015).</p>
13/4	<p>Capacity building workshop to facilitate planning and implementation of digital exchange of aeronautical meteorological information</p> <p>That, the ICAO 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.</p>	<p>Secretariat/ROBEX Chair to advise MET SG/19 in paper (Aug 2015).</p>
13/5	<p>Coordination on planning and implementation of IWXXM</p> <p>That, information be presented to MET SG/19 on the current status of planning and implementation by States, and their needs and requirements to support planning and implementation of IWXXM</p>	<p>Secretariat and ROBEX Chair to advise MET SG/19 of status and plans within the region (Aug 2015).</p>
13/6	<p>ROBEX Handbook revisions</p> <p>That, revisions to the ROBEX Handbook be drafted to:</p> <ul style="list-style-type: none"> a) Ensure the guidance clearly defines the procedure for OPMET data to be relayed to the SADIS and WIFS gateways under the ROBEX scheme; and b) Eliminate unnecessary duplication of information in both the ROBEX Handbook and ICD. 	<p>Secretariat is preparing draft revisions to the ROBEX Handbook which will be presented to the next ROBEX WGMET SG/19 (Feb 2016)</p>

No.	Title/description	Follow-up action (target/completion dates in brackets)
13/7	Regional guidance on the frequency of issuance of routine TAF That, the Secretariat be invited to investigate feasibility of including provisions in the regional guidance material related to the issuance of routine TAF at intervals of three (3) hours.	Secretariat is going to discuss with our ICAO officers (Feb 2016)

APPENDIX C
ICAO APAC REGIONAL OPMET BULLETIN EXCHANGE
WORKING GROUP (ROBEX WG)

1. COMPOSITION
The ROBEX WG is made up of members from States representing the five APAC Regional OPMET Data Banks (RODBs): <i>Australia/Brisbane, Fiji/Nadi, Japan/Tokyo, Singapore and Thailand/Bangkok</i> ; the World Area Forecast System (WAFS), Satellite Distribution System (SADIS) and WAFS Internet File System (WIFS) Provider States: <i>United Kingdom and United States</i> ; the three APAC Volcanic Ash Advisory Centres (VAACs): <i>Australia/Darwin, Japan/Tokyo and New Zealand/Wellington</i> ; the designated focal points for SIGMET tests and regional OPMET bulletin exchange (ROBEX); and the International Air Transport Association (IATA).

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2. DESCRIPTION	
Objective	Increase OPMET availability and reliability needed for flight planning (efficiency) and in-flight re-planning (safety) in support of the Global Air Navigation Plan framework and the aviation system block upgrade (ASBUs) methodology.
Benefits	Increase in safety and efficiency (time and fuel savings).
Terms of Reference	Under guidance from the ICAO Secretariat: <ul style="list-style-type: none"> - Review the OPMET exchange schemes in the APAC, MID and neighbouring Regions and develop proposals for their optimization, taking into account the requirements by the aviation users and the current trends for global OPMET exchange; - Develop standardized quality control, monitoring and management procedures related to ROBEX and other exchange schemes for OPMET information; - Review the regional guidance material related to OPMET exchange; - Liaise with other groups dealing with communication and/or management aspects of the OPMET exchange in APAC, other ICAO Regions and the WAFS Provider States.

Work Programme	<p>The work to be addressed by the ROBEX WG includes:</p> <ul style="list-style-type: none"> - Examine new and existing requirements for OPMET exchange in APAC, MID and other neighbouring regions along with the WAFS Provider States and assess the feasibility of satisfying these requirements, taking into account the availability of the data; - Keep the ROBEX scheme and other OPMET exchange schemes under review and prepare proposals for updating and optimizing the schemes; - Review and update of the procedures for inter-regional OPMET exchange and ensure the availability of the required APAC and MID OPMET data for Secure SADIS FTP and WIFS; - Review the regional guidance material on OPMET exchange to ensure procedures are provided for the exchange of all required OPMET data types: SA, SP, FT, WA, WS, WC, WV, FK, FV and UA; - Conduct trials and develop procedures for quality control, monitoring and management of the OPMET exchange to foster implementation of quality management of OPMET data by the ROBEX centres and the RODBs; - Report on deficiencies in the format and dissemination of OPMET messages; - Participate in the testing, implementation and awareness of the transition to digital exchange of OPMET using a code form based on IWXXM XML/GML; - Conduct regular regional VAAC back-up and SIGMET tests; - Provide support for the APAC Volcanic Ash Exercises; - Develop quality control guidance material and promote implementation of quality control for OPMET management.
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3. COMMUNICATION STRATEGIES

Description	Target Audience	Delivery Method	Frequency / Date	Responsibility
Work Plan	ROBEX WG Members	Document via email & ROBEX WG Meeting	As required but reviewed at the ROBEX WG Meeting and the MET SG	Chair
General correspondence	ROBEX WG Members	Email	As required	ROBEX WG Members
Task Force Working Group Meeting	ROBEX WG Members	Meeting	Annually	Chair
Status & Milestone Reports	ICAO Secretariat and ROBEX WG Members	Report via email & WP at ROBEX WG Meeting	Annually	Chair
Task Force Report	All APAC States	Working Paper at MET SG	Annually	Chair

4. PERFORMANCE FRAMEWORK FORM (PFF)

Tasks	Time Frame	Responsibility	Status	Milestone
Task 1: Improve the availability of OPMET data	Ongoing	ROBEX WG		1
Task 2: Improve timeliness, compliance and regularity of OPMET exchange	Ongoing	ROBEX WG		2
Task 3: Identify gaps and errors in processes, procedures and OPMET exchange	Ongoing	ROBEX WG		3, 4, 5
Task 4: Review regional guidance	Ongoing	ROBEX WG		3, 4, 5, 6

material related to OPMET data				
Task 5: Facilitate and monitor the migration to IWXXM in support of SWIM AIM and new MET codes (e.g. XML)	2015-2018 2013-2016	ROBEX WG		7
Task 6: Review the RODB structure	2017 TBC	ROBEX WG		8

5. MILESTONES

Milestone	Accountability	Dates	Status
Milestone 1: Achieve 95% (90%) or greater OPMET availability for AOP (non-AOP) aerodromes at RODBs and WAFCS WAFS Internet based services as defined in FASID Tables Met2A.	ROBEX WG	Annually Jun	
Milestone 2: Achieve OPMET timeliness, compliance and regularity index of 0.95 (0.90) for AOP (non-AOP) aerodromes at RODBs and WAFCS WAFS Internet based services as defined in FASID Tables Met2A.	ROBEX WG	Annually Jun	
Milestone 3: Improved issuance and compliance of test SIGMETs tests conducted, analysed and report complete.	ROBEX WG	Annually Jun	
Milestone 4: VAAC Back-up tests conducted, analysed and report complete.	VAAC Back-up Focal Points	Annually Jun	
Milestone 5: IROG Back-up tests conducted, analysed and report complete.	Bangkok RODB	Annually Mar	
Milestone 6: RODB Monitoring procedures updated in ROBEX Handbook	Secretariat	Jun 2014	
Milestone 7: Report to ROBEX WG & MET SG on IWXXM digital OPMET exchange (i.e. XML) & testing.	Secretariat & Chair	Annually Mar & May	
Milestone 8: RODB structure review complete.	ROBEX WG	2017 TBC	
Milestone 9: Improved efficiency and effectiveness of ROBEX scheme	RODBs	Annually Jun	

6. WORK PLAN

Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 1: Increasing OPMET availability at RODBs & WAFCS (95 and 90% for AOP and non-AOP aerodromes) WAFS Internet based services as defined in FASID Tables Met2A				
Activity 1.1: Tokyo RODB to investigate providing Bangkok RODB data in standard format Assist Nadi RODB in conducting OPMET availability testing	Tokyo RODB Brisbane RODB	-	Jun 2015 Nov 2014	
Activity 1.2: Perform real time monitoring if required	RODBs & IATA	-	If required	
Activity 1.3: Monitor RODB OPMET reception in Jan and use Dec as PI threshold.	RODBs	-	Annually Dec/Jan	

6. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 1.4: Monitor SADIS/WIFS OPMET reception.	IATA	-	Annually Jan	
Activity 1.5: Score against FASID Table MET 1A and 2A.	Singapore, Tokyo, Bangkok RODBs & IATA	1.3 & 1.4	Annually Feb	
Activity 1.6: Prepare ROBEX paper and report results and deficiencies to ROBEX WG meeting.	Bangkok RODB & IATA	1.5	Annually Mar	
Activity 1.7: Report summary of OPMET availability results to MET SG	Secretariat & Chair	1.6	Annually May	
Activity 1.8: Advise States of OPMET deficiencies.	Secretariat	1.7	Annually Jun	
Activity 1.9: Provide support for States to rectify deficiencies if requested.	RODBs	1.8	As required	
Activity 1.10: Exchange Develop a common dataset and assess the consistency between RODBs of the 'availability' calculation and standardise.	Singapore, Tokyo, Bangkok RODBs	-	Aug Jul 2014 5	
Milestone 1: Achieve 95% (90%) or greater OPMET availability for AOP (non-AOP) aerodromes at RODBs & WAFS.	ROBEX WG	1.9	Annually Jun	
Activity 2: Improving OPMET timeliness, compliance and regularity at RODBs and WAFS				
Internet based Services				
Activity 2.1: Investigate the ingestion of AMHS data into analysis Assist Nadi RODB to collect the data for conducting OPMET testing	Bangkok & Tokyo Brisbane RODB	-	Nov 2014 5	
Activity 2.2: Monitor OPMET timeliness, compliance and regularity in Jan and use Dec as PI threshold.	RODBs & IATA	-	Annually Dec/Jan	
Activity 2.3: Collate and analyse data	Singapore, Tokyo, Bangkok RODBs & IATA	2.2	Annually Feb	
Activity 2.4: Prepare paper and report State irregularities to ROBEX WG meeting	Bangkok RODB & IATA	2.3	Annually Mar	
Activity 2.5: Report summary of OPMET timeliness, compliance and regularity results to METSG	Chair	2.4	Annually May	
Activity 2.6: Inform States of compliance	Secretariat	2.5	Annually Jun	
Activity 2.7: Provide support for States to rectify deficiencies if requested.	RODBs	2.6	As required	

6. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 2.8: Exchange Develop a common dataset and assess the consistency between RODBs of the timeliness, compliance and regularity calculation and standardise.	Singapore, Tokyo, Bangkok RODBs	-	Aug Jul 2014 ⁵	
Activity 2.9: Correct identified issues relating to inconsistencies identified.	Singapore, Tokyo, Bangkok RODBs	2.8	Nov 2014 ⁵	
Milestone 2: Achieve 95% (90%) or greater OPMET timeliness, compliance and regularity for AOP (non-AOP) aerodromes at RODBs & WAFSSs.	ROBEX WG	2.9	Annually Jun	
Activity 3: SIGMET Tests				
Activity 3.1: Review SIGMET Test procedures	ROBEX WG	-	Annually Aug	
Activity 3.2: State Letter regarding SIGMET Tests	Secretariat	3.1	Annually Sep	
Activity 3.3: Conduct WC SIGMET Tests	RODBs	3.2	Annually 1 st Wed in Nov	To be conducted on 5 Nov 2014 4 Nov 2015
Activity 3.4: Conduct WV SIGMET Tests	RODBs	3.2	Annually 2 nd Wed in Nov	To be conducted on 12 Nov 2014 11 Nov 2015
Activity 3.5: Conduct WS SIGMET Tests	RODBs	3.2	Annually 3 rd Wed in Nov	To be conducted on 19 Nov 2014 18 Nov 2015
Activity 3.6: Collate and analyse test data against FASID tables	RODBs	3.3 - 3.5	Annually Jan	
Activity 3.7: Report to ROBEX WG	SIGMET Focal Points	3.6	Annually Mar	
Activity 3.8: Report on SIGMET Test Results to MET SG.	Chair	3.7	Annually May	
Activity 3.9: Advise States of SIGMET deficiencies	Secretariat	3.8	Annually Jun	
Milestone 3: Improved issuance and compliance of test SIGMETs	ROBEX WG	3.9	Annually Jun	
Activity 4: VAAC Back-up Tests				

6. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 4.1: Review VAAC Back-up Test procedures	ROBEX WG and VAACs		May 2014 2015 and then annually Jan	
Activity 4.2: Update VAAC Back-up Procedures	Secretariat	4.1	Annually May	
Activity 4.3: State Letter regarding VAAC Back-up Tests	Secretariat	4.1	Annually Aug	
Activity 4.4: Conduct VAAC Back-up Test between Darwin and Tokyo	VAACs	4.3	Annually Oct – TBC	
Activity 4.5: Conduct VAAC Back-up Test between Darwin and Wellington	VAACs	4.3	Annually Oct – TBC	
Activity 4.6: Collect test results and send to VAAC Provider State members	RODBs	4.4	Annually Oct – TBC	
Activity 4.7: Analyse Test results	VAAC Back-up Focal Points Members	4.5	Annually Nov	
Activity 4.8: Report to ROBEX WG	VAAC Back-up Focal Points Members	4.6	Annually Feb	
Activity 4.9: Report to MET SG.	Chair	4.8	Annually May	
Activity 4.10: Advise relevant States, VAACs and RODBs of any deficiencies.	Secretariat	4.7	Annually Jun	
Milestone 4: VAAC Back-up Tests conducted, analysed and report complete.	VAAC Back-up Focal Points Members	4.8	Annually Jun	
Activity 5: IROG Back-up Tests				
Activity 5.1: Investigate back-up arrangements of IROG Tokyo & Brisbane	Secretariat	-	Oct 2015	
Activity 5.2: Review IROG Back-up Test procedures to include all IROG.	All IROGs	-	Annually Feb	
Activity 5.3: Updated IROG Back-up Procedures in ROBEX Handbook.	Secretariat	5.2	Annually May	

6. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 5.4: Identify list of MET Bulletins to monitor.	All IROGs	-	Annually Jan/Feb	
Activity 5.5: Conduct IROG Back-up Tests	All IROGs	5.4	Annually Jan/Feb	
Activity 5.6: Collect & analyse test results	All IROGs	5.5	Annually Feb	
Activity 5.7: Report to ROBEX WG	Bangkok RODB	5.6	Annually Mar	
Milestone 5: IROG Back-up Tests conducted, analysed and report complete.	Bangkok RODB	5.7	Annually Mar	
Activity 6: APAC RODB Monitoring procedures				
Activity 6.1: Letter to ROBEX Centres requesting confirmation that ROBEX Handbook Appendix A, B & C has the correct information regarding the Bulletins. Also ask for Hours of Operation and Issue Times of METAR and TAF.	Secretariat	-	Annually May	
Activity 6.2: Review ROBEX Handbook Appendix A & B table structure to include columns for Hours of Operation and Issue Times.	Chair	6.1	Annually Jul	
Activity 6.3: Review monitoring procedure in ROBEX Handbook.	All RODBs	-	Annually Aug	
Activity 6.4: RODBs to indicate differences in procedures and resolve these differences.	All RODBs	6.3	Annually Aug	
Activity 6.5: Any changes to RODB monitoring procedures and updates to Appendix A, B and C in ROBEX Handbook.	Secretariat	6.2 & 6.4	Annually Sep	
Milestone 6: RODB Monitoring procedures updated in ROBEX Handbook	Secretariat	6.5	Annually Sep	
Activity 7: New OPMET Exchange Formats				
Activity 7.1: Monitor migration to iWXXM AIM and new OPMET codes (i.e. XML/GML).	Secretariat	-	As required	

6. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 7.2: Investigate, and develop a plan, to undertake IWXXM tests with another IWXXM centre Review documentation relating to the XML schema. Feedback through Secretariat.	Singapore RODB		May 2014 Nov 2015	
Activity 7.3: Report to MET SG on plans for implementation of XML schema at APAC RODBs.	Secretariat		Next meeting MET SG	
Activity 7.4: Conduct a trial of the new XML schema developed by WMO TT AvXML.	Singapore RODB	7.2	Oct 2014 Mar 2016	
Activity 7.5: Consider options and strategies to deal with digital data exchange of OPMET data in IWXXM format within its area of responsibility; including non-compliance of OPMET products with requirements of WMO TT AvXML schema.	WG RODBs		Feb 2015 2016	
Activity 7.6: Increase awareness of the requirement of digital exchange of OPMET data in IWXXM format and the impact of inability to do so.	RODBs & Secretariat WG		As required	
Activity 7.7: Report on the status of the testing and implementation of digital OPMET exchange.	RODBs		Annually Mar	
Activity 7.8: Report to ROBEX WG regarding testing and implementation of digital OPMET exchange internationally APAC.	Secretariat	7.4-7.7	Annually Mar	
Activity 7.9: Prepare information (e.g. issues, CONOPS) for ICAO international IWXXM Working Group	WG		Feb 2016	
Activity 7.10: Participate in the ICAO international IWXXM Working Group.	WG		Mar 2016	
Milestone 7: Report to ROBEX WG & MET SG on digital OPMET IWXXM exchange (i.e. XML) & testing.	Secretariat & Chair	7.8	Annually May	
Activity 8: Review RODB Structure				
Activity 8.1: Review optimum inter-regional exchange of APAC OPMET data. In particular consolidate data sent to AFI from either Bangkok or Brisbane.	Bangkok & Brisbane RODBs	-	Dec 2014	

6. WORK PLAN				
Activity / Milestone	Accountability	Predecessors	Date	Status
Activity 8.2: Implement optimum inter-regional exchange to AFI	Bangkok or Brisbane RODBs		Jan 2015	
Activity 8.1: Review ROBEX Scheme diagram vs Table in 11.1 of ROBEX Handbook.	All RODBs	8.2	Oct 2014 2015 May 2015 2016	
Activity 8.2: Review AFTN network diagram and add an AMHS diagram in the ROBEX Handbook.	Secretariat	-	Oct 2014 2015	
Activity 8.3: Review RODB structure taking into account: <ul style="list-style-type: none"> o Capability; o Message structure (XML) IWXXM readiness; o Delivery methods (internet, AMHS); o New Products (i.e. ATM requirements); o International consistency. 	ROBEX WG	-	2017	
Milestone 8: RODB structure review complete.	ROBEX WG	-	2017	
Activity 9: Improve Efficiency and effectiveness of ROBEX Scheme				
Activity 9.1: Align content of SA bulletins with FT bulletins, where appropriate	All RODBs	-	Oct 2015	
Activity 9.2: Adjust FT bulletin filing time, where appropriate	All RODBs	-	Oct 2015	
Activity 9.3: Review FASID table and ensure all necessary aerodromes are contained in OPMET bulletins	All RODBs	-	Oct 2015	
Activity 9.4: Review and update ROBEX HB and ICD to align with of OPMET bulletin contents	All RODBs	-	Oct 2015	
Milestone 9: Efficiency and effectiveness of ROBEX Scheme improved	ROBEX WG	-	2017	
