

**INTERNATIONAL CIVIL AVIATION ORGANIZATION  
ASIA AND PACIFIC OFFICE**



**REPORT OF  
THE TWENTIETH MEETING OF THE METEOROLOGY  
SUB-GROUP (MET SG/20) OF APANPIRG**

**06 – 09 June 2016  
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

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## **1. Introduction**

1.1. The Twentieth Meeting of the Meteorology Sub-group (MET SG/20) of the Asia/Pacific (APAC) Air Navigation Planning and Implementation Regional Group (APANPIRG) was held at the International Civil Aviation Organization (ICAO) – APAC Office in Bangkok, Thailand from 6 to 9 June 2016.

## **2. Attendance**

2.1. The meeting was attended by 65 experts from Australia, Bangladesh, Cambodia, China, Hong Kong-China, Macao-China, India, Indonesia, Japan, Lao (Peoples Democratic Republic), Malaysia, Maldives, Mongolia, New Caledonia, New Zealand, Pakistan, Philippines, Republic of Korea, Singapore, Thailand, United Kingdom, United States, Viet Nam, International Air Transport Association (IATA), International Federation of Airline Pilot's Associations (IFALPA), World Meteorological Organization (WMO) and the ICAO. The List of Participants is provided at **Attachment 1** to this Report.

## **3. Chair and Secretariat**

3.1. Ms. Susan O'Rourke presided over the meeting in the role as Chairperson. Mr. Peter Dunda, ICAO Regional Officer, 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 28 working papers (WP), 17 information papers (IP), 1 slide presentation (SP) and 2 flimsies. A list of papers/presentations/flimsies is provided at **Attachment 2** to this Report.

*Note: Additional material considered by the meeting is discussed under Agenda Item 6.3.*

## **5. Draft Conclusions, Draft Decisions and Decisions**

5.1. MET SG/20 recorded its actions in the form of Draft Conclusions, Draft Decisions and Decisions within the following definitions:

5.1.1. 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;

5.1.2. Draft Decisions deal with the matters of concern only to APANPIRG and its contributory bodies; and

5.1.3. Decisions relate solely to matters dealing with the internal working arrangements of the Sub-group.

Draft Conclusions

5.2. MET SG/20 formulated the following 5 Draft Conclusions:

**Draft Conclusion 20/1** — Proposal for amendment to the Asia/Pacific Regional Air Navigation Plan

**Draft Conclusion 20/9** — Expedited availability of extended AMHS

**Draft Conclusion 20/10** — Membership of the MET/R WG from both MET and ATM experts

**Draft Conclusion 20/11** — Guidance on SMS SARPs for MET authority and MRT service provider

**Draft Conclusion 20/18** — Endorsement of draft regional guidance on aerodrome tsunami

Draft Decisions

5.3. MET SG/20 formulated the following Draft Decision:

**Draft Decision 20/2** — Consequential amendments to the regional guidance material related to OPMET provision changes by the US

Decisions

5.4. MET SG/20 adopted the following 15 Decisions:

**Decision 20/3** — Impacts on APAC States of the implementation of “remarks” appended to US METAR/SPECI messages

**Decision 20/4** — Update of air navigation deficiencies in the MET field

**Decision 20/5** — Improvement of the Darwin and Wellington VAAC backup tests

**Decision 20/6** — SADIS user States and SADIS users to prepare for cessation of SADIS 2G

**Decision 20/7** — IWXXM and AMHS Survey

**Decision 20/8** — Coordination on implementation of extended AMHS

**Decision 20/12** — Capacity building initiatives to support implementation of the exchange of meteorological information in IWXXM format

**Decision 20/13** — SIGMET Guide updates

**Decision 20/14** — SIGMET issuance procedures for thunderstorm

**Decision 20/15** — SIGMET pamphlet for volcanic ash

**Decision 20/16** — SIGMET pamphlet updates for Amendment 77 to Annex 3

**Decision 20/17** — Revision of draft regional guidance on aerodrome tsunami warning

**Decision 20/19** — Terms of reference and work programme of the MET SG and the contributory working groups and steering group under the MET SG

**Decision 20/20** — Improved coordination with Pacific Island States

**Decision 20/21** — Promote information sharing on the impacts of climate change on aviation

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## 1. OPENING OF THE MEETING

1.1. The Secretary, Mr. Peter Dunda welcomed all participants on behalf of the ICAO Regional Director, Mr. Arun Mishra. The Chairperson, Ms. Susan O'Rourke welcomed all participants and outlined the purpose and objective of the meeting.

## 2. ORGANIZATIONAL MATTERS

### WP/01 — Adoption of the agenda

2.1. The meeting adopted the draft agenda (below), which was distributed with the invitation letter prior to the meeting:

**Table 1: Agenda of MET SG/20**

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:	Observations, reports, forecasts, advisories and warnings
6.2:	Data exchange
6.3:	MET/ATM coordination
6.4:	Climatological information
6.5:	Governance and training
6.6:	Other
Agenda Item 7:	Regional guidance material
Agenda Item 8:	Future work programme
Agenda Item 9:	Any other business

2.2. Discussion on Agenda Item 6.3: MET/ATM coordination, was conducted in a joint meeting session convened between MET SG/20 and the ICAO APAC Sixth Meeting of the Air Traffic Flow Management Steering Group (ATFM/SG/6) to promote closer coordination between MET and ATM experts and assist in raising awareness on issues of direct interest to both groups.

2.3. Hong Kong, China advised the meeting that the current Vice-Chairperson of the MET SG, Dr Cheng Cho-ming from the Hong Kong Observatory, was unable to continue in the role and could not attend the MET SG/20 meeting. The meeting expressed appreciation for Dr Cheng Cho-ming's efforts and acknowledged the long-term and valuable contributions he made to APANPIRG in the role as Vice-Chairperson of the MET SG, which he has performed since 2013, and in his role as Co-Vice-Chairperson of the combined CNS/MET SG from 2010 to 2013.

2.4. In view of the above, further discussion on the election of a new Vice-Chairperson (and Chairperson) for MET SG was deferred to Agenda Item 9: Any other business.

### 3. REVIEW OUTCOMES FROM OTHER ICAO GROUPS

#### WP/02 – Review of MET SG/19

3.1. The meeting reviewed the eleven Decisions adopted by MET SG/19, which was held in Bangkok, Thailand, from 3-6 August 2015, and noted that follow-up actions on the Decisions had been incorporated into the work programme of the Sub-group and its contributory working groups, as necessary.

3.2. In total, nine Draft Conclusions formulated by MET SG/19 were forwarded to APANPIRG/26 for further consideration (discussed in WP/03).

#### WP/03 – Review of APANPIRG/26

3.3. The meeting reviewed information provided on the status of eighteen Conclusions and two Decisions, of direct or indirect relevance to the MET SG, which were adopted by APANPIRG/26, held in Bangkok, Thailand, from 7-10 September 2015 (details provided in WP/03).

*Note: In accordance with the APANPIRG Procedural Handbook, Part II, Working Arrangements, suggestions by the APANPIRG calling for amendment or modification of the provisions in the ICAO world-wide provisions (Annexes and PANS) will be submitted to the Air Navigation Commission (ANC) for consideration and action as appropriate.*

3.4. With respect to *Conclusion APANPIRG/26/53 – Tropical Cyclone Advisory (TCA) and SIGMET messages*, which invited ICAO to consider updating Annex 3, the meeting noted that, as the ANC had agreed to consider the issuance of job cards if deemed necessary after receiving feedback from relevant expert groups, members of the ICAO Meteorology Panel (METP) who were present at the MET SG/20 meeting may propose discussion on the status of the above conclusion at the second meeting of the METP (to be held in Montréal, Canada, 17 to 21 October 2016).

3.5. With respect to *Conclusion APANPIRG/26/63 – International Aviation and Climate Change*, further discussion was provided under Agenda Item 9: Any other business.

#### IP/08 – Draft revised APANPIRG procedural handbook

3.6. The meeting noted proposed amendments prepared by the Secretariat to the APANPIRG Procedural Handbook, consequent to *Decision APANPIRG/26/65 – Revised APANPIRG Structure, Terms of Reference and APANPIRG Sub Group Empowerment*, which will be presented to APANPIRG/27 for endorsement.

#### IP/09 – Outcomes from the 3<sup>rd</sup> APANPIRG/RASG-APAC coordination meeting

3.7. The meeting noted that outcomes from the third coordination meeting between the Chairpersons of APANPIRG and the Regional Aviation Safety Groups – Asia Pacific (RASG-APAC) included a revision to the template for reporting the Conclusions/Decisions of APANPIRG and RASG-APAC, which the Sub-groups of APANPIRG were requested to use in 2016 for presenting draft Conclusions/Decisions for consideration and adoption by APANPIRG, as provided below:

**Table 2:** Template for reporting the Conclusions/Decisions of APANPIRG

<b>Conclusion/Decision XX/XX - TITLE</b>	
<b>What:</b>	<b>Expected impact:</b> <input type="checkbox"/> Political / Global <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input type="checkbox"/> Inter -Regional <input type="checkbox"/> Ops/Technical
<b>Why:</b>	
<b>When:</b>	<b>Status:</b>
<b>Who:</b> <input type="checkbox"/> Sub Groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

#### 4. PLANNING AND MONITORING

##### IP/05 – Review Amendment 77 to Annex 3

4.1. Amendment 77 to Annex 3 becomes effective on 11 July 2016 and applicable on 10 November 2016. The amendment introduces provisions for digital format for volcanic ash and tropical cyclone advisory information, AIRMET information, METAR/SPECI, TAF and SIGMET information as a recommended practice, along with other iterative improvements. States are required to inform ICAO of any disapproval before 11 July 2016 and to file any differences, via the Electronic Filing of Differences (EFOD) System, before 10 October 2016 (details of the Amendment 77 are provided in IP/05).

4.2. The ICAO State letter AN 10/1.1-16/17, informing adoption of Amendment 77 to Annex 3, sets out (in its Attachment E) the “Essential steps to be followed by a State in order to implement the proposed amendment to Annex 3”. In response to a query, the Secretary reminded the meeting that States would be obligated to file any differences, as necessary, including with respect to the provisions for the digital format for meteorological information, which according to Annex 3 shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).

*Note: In accordance with the Manual on the Digital Exchange of Aeronautical Meteorological Information (ICAO Doc 10003), the ICAO Meteorological Exchange Model (IWXXM) is an identified component to support the digital exchange of aeronautical meteorological information.*

##### WP/05 – Review Regional Air Navigation Plan (ANP)

4.3. The new, approved version of the APAC ANP, Volume I and Volume II, based on the ICAO Council approved common ANP template, was circulated to States and international organizations concerned in ICAO letters Ref.: T 11/2.1 – AP034/16, dated 29 February 2016, and Ref: T 11/2.1 – AP051/16, dated 11 April 2016. The proposed new APAC ANP, Volume III, also based on the Council approved common ANP template, has been reviewed and adopted by APANPIRG/26 (Conclusion 26/2, refers), but was expected to be circulated to States and international organizations concerned in due course pending further review by the Secretariat.



4.4. The meeting noted that under the terms of reference the MET SG should assist APANPIRG by reviewing Part V – MET of the new ANP and proposing amendments as necessary to ensure the plan reflects current operational requirements. Furthermore, the region-specific responsibilities and requirements, which may need to be amended, are set out in the ANP in Volume I: Table MET I-1 (State volcano observatories), and in Volume II: Table MET II-1 (meteorological watch offices); Table MET II-2 (aerodrome meteorological offices); and Table MET II-3 (VOLMET broadcast). Following review of the new ANP, the meeting proposed amendments to Volume II, Part V – MET: Table MET II-1; Table MET II-2; and Table MET II-3, as shown (marked-up changes) at **Appendix 1** to this Report.

4.5. In order to incorporate the proposed amendments to the MET parts of the new ANP within the context of a broader, coordinated review of the ANP by APANPIRG, the meeting formulated the following Draft Conclusion:

<b>MET SG/20 Draft Conclusion 20/1 – Proposal for amendment to the Asia/Pacific Regional Air Navigation Plan</b>	
<b>What:</b> Endorse the proposal for amendment to the APAC Regional Air Navigation Plan, Volume II, Part V – MET, Table MET II-1, Table MET II-2 and Table MET II-3 – as provided at Appendix 1 to the MET SG/20 Report.	<b>Expected impact:</b> <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
<b>Why:</b> Data in the Tables in the new APAC ANP is not completely aligned with current operational requirements	
<b>When:</b> 8-Sep-16	<b>Status:</b> Draft to be adopted by PIRG
<b>Who:</b> <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: APANPIRG	

4.6. The meeting noted that the fourteenth meeting of the Meteorological Information Exchange Working Group (MET/IE WG/14), under the MET SG, had reviewed the ANP and requested the Secretariat to maintain accessibility to the legacy MET Tables from the previous version of the APAC Regional ANP for States as reference material, including the proposed amendments to FASID Tables MET 3A and 3B, which were related to the area of responsibility of tropical cyclone advisory centres and the recipients of information from volcanic ash advisory centres, until such time that the longer-term management of the information (contained in the legacy FASID Tables MET), which was not integrated in the new ANP, is finally resolved (further discussion on this was provided in WP/16).

WP/07 – Addition of US OPMET data and the provision of remarks as part of the METAR

4.7. The United States (US) informed the meeting of its plan to add 218 non-AOP aerodromes<sup>1</sup> to the

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<sup>1</sup> 'Non-AOP' aerodromes are aerodromes not listed in Tables AOP (Aerodrome Operational Planning) in the ANP and are therefore not subject to formal regional air navigation agreement. It should be noted that OPMET information from non-AOP aerodromes is not subject to formal regional air navigation agreement and that its provision is fully up to the (provider) State concerned.

existing list of 428 aerodromes (in SUG Annex 1/FASID Table MET 2A)<sup>1</sup> where the US is required to issue OPMET information (METAR/SPECI, TAF) for availability in SADIS and WIFS. These 218 non-AOP aerodromes are in addition to the 78 AOP<sup>2</sup> aerodromes in the US where meteorological service is required in accordance with the provisions of Annex 3 and regional air navigation plans.

4.8. Furthermore, the US plans to cease the issuance of OPMET information (METAR/SPECI, TAF) for availability on SADIS and WIFS for 46 non-AOP aerodromes (which are currently listed in SUG Annex 1/FASID Table MET 2A) upon confirmation from the IATA that it has no operational requirement for OPMET from these 46 aerodromes.

4.9. Additionally, the US informed the meeting of its plans to change the WMO abbreviated headings used for OPMET issued by the US for international civil aviation: the WMO abbreviated headings series FT/SA/SPUS21-25 KWBC will be used; and FT/SA/SPUS71-75 KWBC (which are currently in use) will be retired.

4.10. In view of the above, the meeting noted that consequential amendments to regional guidance material (e.g., ROBEX Handbook) would be needed to reflect the proposed new requirements for OPMET information when the proposed US changes are implemented. Furthermore, the US was requested to provide more information on the contents of the OPMET bulletins under the new WMO abbreviated headings series FT/SA/SPUS21-25 KWBC.

4.11. In order to prepare the necessary consequential amendments to regional guidance material discussed above, the meeting agreed to the following Decision:

<b>MET SG/20 Decision 20/2</b> – Consequential amendments to the regional guidance material related to OPMET provision changes by the US	
<p>What: Assess the requirement for, and prepare proposals for amendments to the regional guidance material related to OPMET provision (e.g., ROBEX Handbook) to reflect the planned changes to locations for OPMET provision from the US, as discussed in WP/07.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: Changes in US OPMET requirements presented in WP/07 will need to be reflected in the regional guidance material to ensure the most efficient exchange of the OPMET information within the APAC Region.</p>	
<p>When: Before the OPMET changes are implemented by the US</p>	<p>Status: Adopted by Subgroup</p>

<sup>1</sup> SADIS User Guide (SUG) Annex 1 lists OPMET information (METAR, SPECI and TAF) required in SADIS and WIFS. It should be noted that the SUG Annex 1 is identical to FASID Table MET 2A, which is contained in the previous version of the ANP, Volume II, Facilities and Services Implementation Document (FASID).

<sup>2</sup> ‘AOP’ aerodromes are aerodromes listed in Tables AOP in the ANP and are, therefore, subject to formal regional air navigation agreement. It should be noted that OPMET information from AOP aerodromes is subject to formal regional air navigation agreement and that its provision (in the APAC Region) is required in accordance with the assignment of responsibilities for OPMET facilities and services set out in the APAC ANP, Volume II, Part V – MET, Table MET II-2.

Who:  Sub groups  APAC States  ICAO APAC RO  ICAO HQ  Other: MET/IE WG and US

4.12. The US also informed the meeting of its plans to include additional information in OPMET data issued for international aviation in the form of a “remarks” section appended to the end of the METAR/SPECI message, which the meeting noted is not compliant with the Annex 3 provisions for METAR/SPECI [Annex 3, Table A3-2]. It was not clear as to what the impacts of the additional “remarks” section would be on APAC States using or exchanging the US METAR/SPECI messages when distributed with the appended “remarks” section. The US agreed to assist the Sub-group in determining the impacts of the planned addition of “remarks” appended to the METAR/SPECI message with respect to the use and exchange of OPMET, including any impacts related to AFTN message size limitations.

4.13. To better inform the Sub-group on the impacts of the US plans discussed above, the meeting agreed to the following Decision:

<b>MET SG/20 Decision 20/3</b> – Impacts on APAC States of the implementation of “remarks” appended to US METAR/SPECI messages	
What: Assess the impacts for APAC States of the implementation of a “remarks” section appended to the end of METAR/SPECI messages issued by the US as discussed in WP/07.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: APAC States need to be informed of impacts on APAC international air navigation systems that may result from the distribution by the US of non-Annex 3-compliant OPMET messages.	
When: Before the OPMET changes are implemented by the US	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/IE WG and US	

4.14. The meeting noted that an effective date (or dates) for the changes in US OPMET issuance discussed in WP/07 was not provided, however the US indicated that it would provide a minimum notice of 75 days before implementation of the changes.

## 5. AIR NAVIGATION DEFICIENCIES IN THE MET FIELD

### WP/08 – Review air navigations deficiencies in the MET field

5.1. The list of APANPIRG air navigation deficiencies in the MET field, and the relevant States’ associated corrective action plans (CAPs) were reviewed by the meeting, as provided in the *Reporting Form on Air Navigation Deficiencies* at the Attachment to WP/08. The meeting noted the long-term lack of significant progress in resolving some of the air navigation deficiencies in the MET field (e.g., some cases date back to 1995), and that, in the *Reporting Form*, updates on CAPs had been infrequent and, in most cases, the CAPs were not described concisely and lacked defined target dates.

5.2. The meeting was reminded that the resolution of air navigation deficiencies was given highest priority by the APANPIRG, and that in September 2015, APANPIRG/26 urged States to put in additional resources to resolve the deficiencies and inform ICAO on the actions taken.

5.3. In accordance with the *Uniform Methodology for the identification, assessment and reporting of air navigation deficiencies*, provided in the *APANPIRG Procedural Handbook*, States with deficiencies are responsible to provide updates to the database (of APANPIRG air navigation deficiencies), and periodic updates are required annually (at the least) by States for review by APANPIRG and Sub-group meetings.

5.4. Some States have reported progress on CAPs, but the necessary validation by ICAO (with assistance from States and appropriate international organizations as required) of the corrective action taken has not progressed sufficiently in accordance with the *Uniform Methodology*; mainly due to the difficulty in obtaining adequate supporting data: e.g., objective data to validate the corrective action/s taken and/or official reports (by the State/s concerned) providing full details of the action/s taken.

5.5. The meeting recognized that the development and implementation of CAPs, and the reporting of progress on the CAPs, needed to be improved significantly in order to comply with the *Uniform Methodology* and to meet the APANPIRG objectives towards the resolution of air navigation deficiencies in the APANPIRG database.

5.6. In view of the above, the meeting agreed to the following Decision:

<b>MET SG/20 Decision 20/4 – Update of air navigation deficiencies in the MET field</b>	
<p>What: Update and improve the information in the <i>Reporting Form on Air Navigation Deficiencies (in the MET field)</i>, including: a) concise and concrete proposals for CAPs with defined target dates; b) updates on the progress of existing CAPs; and c) official reports providing full details of the corrective actions taken where deficiencies have been resolved.</p>	<p>Expected impact:</p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p>Why: The resolution of air navigation deficiencies in the MET field (in the APANPIRG database) has lacked significant progress over several years, due in part to inadequate information in the Reporting Form, e.g., infrequent updates and lack of concise and concrete CAPs with defined target dates.</p>	
<p>When: 8-Aug-16</p>	<p>Status: Adopted by Subgroup</p>
<p>Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:</p>	

## **6. RESEARCH, DEVELOPMENT AND IMPLEMENTATION ISSUES IN THE MET FIELD**

### 6.1. Observations, reports, forecasts, advisories and warnings

#### WP/09 – Review outcomes from MET/S WG/6

6.1.1. The sixth meeting of the Meteorological Services Working Group (MET/S WG/6) was convened following the establishment of the working group to replace the former MET/H TF and WAFS TF (MET SG Decision 19/2 refers). The terms of reference and work programme of MET/S WG now covers all required aeronautical meteorological services, but in particular improving the quality of observations, forecasts, advisories and warnings; including facilitating implementation of the international airways volcano watch (IAVW) and international tropical cyclone warning system. A copy of the terms of reference and work programme document reviewed and revised by MET/S WG/6 is provided at the Attachment 1 to WP/09.

6.1.2. A conjoint session was held between MET/S WG/6 and the fourteenth meeting of the Meteorological Information Exchange Working Group (MET/IE WG/14) to address issues common to both groups including the implementation of SIGMET information and volcanic ash/tropical cyclone advisory information (further discussion on this is provided in WP/16).

6.1.3. Tasks completed by the MET/S WG included: finalized and published the SIGMET pamphlets as regional guidance material to support MWOs with the issuance of SIGMET for phenomena other than tropical cyclone and volcanic ash (WS SIGMET) and for tropical cyclone (WC SIGMET); drafted a new SIGMET pamphlet for volcanic ash (WV SIGMET); revised and aligned all three SIGMET pamphlets in accordance with Amendment 77 to Annex 3; and progressed the draft regional guidance materials for tsunami/aerodrome warning and for SIGMET information for radioactive clouds. Full details on the status of the MET/S WG task list are provided at the Attachment 2 to WP/09.

6.1.4. The revised work programme of the MET/S WG included the introduction of a task to monitor the regional implementation and utilization of WAFS information and to assess the regional WAFS-related training needs (i.e., task migrated to the new MET/S WG from the former WAFS TF), updated tasks to further develop the draft regional guidance for tsunami/aerodrome warning and SIGMET information for radioactive clouds, and a new task to conduct targeted SIGMET monitoring in support of the resolution of air navigation deficiencies in the MET field in the APAC Region.

6.1.5. Further discussion related to the work programmes of all the working groups under the MET SG is provided at Agenda Item 8: Future work programme.

#### WP/11 – Wellington and Darwin VAAC backup test

6.1.6. In accordance with the provisions in Annex 3, Chapter 3, 3.5, and ICAO Doc 9766, Appendix D, an annual backup test was conducted between the Wellington VAAC and Darwin VAAC; specifically to address the requirement that, in case of interruption of the operation of one VAAC, its functions shall be carried out by the other VAAC. The backup test was conducted on 19 April 2016 using the VAAC backup procedures developed jointly by the Wellington and Darwin VAACs and published in Appendix H of the APAC Regional SIGMET Guide.

6.1.7. Based on evidence that the volcanic ash advisory messages issued during the backup test were successfully disseminated via AFTN in a timely manner, the two VAACs believed the backup test was successful. However, due to the relatively limited number of acknowledgements received by the VAACs to the advisory messages disseminated during the test, the VAACs have planned to re-run the backup test in approx. 4 - 6 months' time (from the original test date) to ensure and confirm that the backup test advisory messages are received (by all the intended backup test participants).

6.1.8. In view of the above, the meeting agreed to the following Decision:

<b>MET SG/20 Decision 20/5 – Improvement of the Darwin and Wellington VAAC backup tests</b>	
<p><b>What:</b> Include appropriate tasks in the MET/S WG work programme supporting the annual programme of VAAC backup tests, including: coordination with participants; follow-up on issues arising from backup tests; and recommendations for improvement of the backup test procedures.</p>	<p><b>Expected impact:</b></p> <p><input type="checkbox"/> Political / Global</p> <p><input type="checkbox"/> Inter-regional</p> <p><input type="checkbox"/> Economic</p> <p><input type="checkbox"/> Environmental</p> <p><input checked="" type="checkbox"/> Ops/Technical</p>
<p><b>Why:</b> In accordance with ICAO Annex 3, Chapter 3, 3.5, and ICAO Doc 9766, Appendix D, backup arrangements in case of interruption of the operation of a VAAC should be tested at least annually.</p>	
<p><b>When:</b> 8-Aug-16</p>	<p><b>Status:</b> Adopted by Subgroup</p>
<p><b>Who:</b> <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/S WG</p>	

6.1.9. The meeting was informed that the Tokyo and Wellington VAACs had also established a coordination procedure for the hand-over and collaborative backup of VAAC operations in the event that Darwin VAAC would not be able to continue to provide VAAC services for the entire area of responsibility.

IP/02 – Demonstration on collaborative SIGMET issuance

6.1.10. Philippines, Viet Nam and Japan jointly conducted a demonstration project from 9 to 20 May 2016 on collaborative SIGMET issuance, including cross-FIR-boundary coordination. MWOs in Philippines and Viet Nam issued SIGMET information using phenomenon-based advisory information (on thunderstorms) provided by Japan. Participating users of SIGMET information indicated that the collaborative approach was useful to operations and considered that it resulted in improved accuracy and availability of SIGMET information. The project organizers considered the demonstration highlighted the role of a reliable advisory system to support improved SIGMET service, especially across multiple MWOs' areas of responsibility, and the role of MWOs with respect to optimizing SIGMET information based on local conditions and user requirements. Future work will include development of SIGMET harmonization procedures, verification and possible extension to other APAC States.

IP/14 – WMO support to SIGMET coordination

6.1.11. Singapore hosted a kick-off meeting (25-26 May 2016) for WMO's pilot project on SIGMET coordination. The objective: to improve SIGMET information over the combined area of responsibility of MWOs in Indonesia, Malaysia and Singapore through coordinated meteorological watch and harmonized issuance of SIGMET. Of major concern was rapidly developing thunderstorms, which required

expeditious coordination between MWOs. A common visualization platform was highly desirable; Japan (IP/02) and Hong Kong, China (IP/16) demonstrated solutions that could be used. The project trial period would cover July to December 2016; a wrap-up meeting and planning for an operational phase envisaged in Q1, 2017.

IP/15 – Work on the improvement of SIGMET issuance  
and  
IP/06 – Improvement of MET services by training

6.1.12. Since the second meeting of the Meteorological Warnings Study Group (METWSG/2), many efforts were put into the improvement of SIGMET issuance and several actions were undertaken by China, such as hosting SIGMET advisory trial in Asia, developing system for the preparation, issuance and dissemination of SIGMET advisory, issuing SIGMETs for the Phnom Penh (VDPP) FIR, providing on-the-job training for forecasters from the State Secretariat of Civil Aviation (SSCA) of Cambodia, and arranging training courses under the Voluntary Cooperation Programme (VCP) of WMO to help to develop the knowledge in the issuance of SIGMETs and in application of the SIGMET advisory information. Besides hosting a training course to help Cambodia improve its SIGMET service, China plans to strengthen its support for regional collaboration by providing SIGMET advisory information through its Asian Aviation Weather Centre to be established as a collaborative effort of CAAC, CMA and the Hong Kong Observatory.

IP/16 – Tools available for SIGMET coordination

6.1.13. Graphical tools demonstrated by Hong Kong, China included: (a) graphic display of SIGMET in the form of polygon overlaid on enhanced satellite image with timelines to show validity periods; and (b) web-based SIGMET preparation system that allowed aeronautical meteorological personnel to draw the SIGMET area and automatically generate content of the SIGMET message. Noting that these tools could be useful to facilitate SIGMET coordination across FIR boundaries and for preparation of SIGMET, the meeting welcomed the offer from Hong Kong, China to make these tools available to States participating in the pilot project on SIGMET Coordination (discussed in IP/14).

IP/03 – Harmonized approach for the regional improvement of en-route hazardous weather information

6.1.14. Japan encouraged international collaborative initiatives, such as those discussed in IP/02 and IP/14, aimed at meeting users' requirements for phenomenon-based information concerning en-route hazardous meteorological conditions through the improved coordination and harmonization of SIGMET service across adjacent MWOs' areas of responsibility in the APAC Region. Furthermore, Japan is willing to provide an advisory centre as part of the implementation of a proposed regional advisory system for select en-route hazardous meteorological conditions, noting that provisions for the proposed system are still under development by the ICAO METP – Working Group on Meteorological Information and Services Development (WG MISD).

IP/04 – Development of a comprehensive turbulence index based on the global model to support the issuance of SIGMET

6.1.15. Japan developed a new, comprehensive forecasting index, “TBindex”, to support SIGMET issuance related to turbulence. TBindex combines multiple, independent, conventional turbulence indices used for specific meteorological scenarios. TBindex for all flight levels is generated by Japan’s numerical weather prediction model to support SIGMET issuance for the Fukuoka FIR and Japan’s domestic significant weather forecast service. The TBindex domain was recently expanded to cover the APAC Region. Verification over a trial period shows that TBindex was significantly more accurate than conventional turbulence indices. Japan will commence operational use of TBindex in June 2016 to support improved accuracy of SIGMET information.

IP/07 – Introduction of the HimawariCast service and important information on related satellite switchover

6.1.16. Japan provided an overview of the new-generation geostationary meteorological satellite “Himawari-8” and the related data dissemination service known as “HimawariCast”<sup>1</sup>. The HimawariCast service provides full-disk images from Himawari-8 captured at 10-minute intervals disseminated via a communication satellite (JCSAT-2A). A switchover of the communication satellite used for the HimawariCast service (from JCSAT-2A to JCSAT-2B) is scheduled to take place in July 2016. Existing users will need to take the necessary steps (provided at the website below) to enable continued receipt of the HimawariCast service (via JCSAT-2B) after the switchover is complete at 03 UTC on 20 July 2016:

[http://www.data.jma.go.jp/mscweb/en/himawari89/himawari\\_cast/himawari\\_cast.html](http://www.data.jma.go.jp/mscweb/en/himawari89/himawari_cast/himawari_cast.html)

IP/10 – Darwin VAAC management report

6.1.17. Darwin VAAC issued 2592 volcanic ash advisories from 1 February 2015 to 31 January 2016, which was a significant increase from previous years. A brief summary was given of major eruptions and significant operational changes were discussed such as the commencement of operational use of Himawari-8 data, the relocation of Darwin VAAC operations to Melbourne and the secondment of a volcanologist to Darwin VAAC from Geoscience Australia. A summary of the testing and operational use of VAAC backup arrangements with Tokyo and Wellington VAACs was also discussed.

IP/11 – Survey on operational use of WAFS and WAFS training needs

6.1.18. Information was presented on the results of a survey in the APAC Region conducted from mid-December 2015 to mid-January 2016 on the operational use of services and products from service providers of the World Area Forecast System (WAFS) in APAC Region and the WAFS training needs of APAC States.

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<sup>1</sup> The images from Himawari-8 are used for weather analysis, forecast and severe weather monitoring, and contribute to prevention and mitigation of natural disasters, such as typhoon, heavy rain and heavy snow [Meteorological Satellite Center (MSC) / Japan Meteorological Agency (JMA)].



WP/13 – Summary of recent and forthcoming developments to the WAFS

6.1.19. With the establishment of the ICAO MET Panel, and disbandment of previous ICAO global study groups and operations groups in the MET field, the MET Panel – MET Operations Group (MOG) has been designated to provide oversight of the future development of the World Area Forecast System (WAFS).

6.1.20. The meeting reviewed information on the following developments:

- Provision of additional flight levels to WAFS Upper Air Forecasts with Amendment 77 to Annex 3;
- Inclusion of verification data for harmonized WAFS gridded upper air forecasts for Clear Air Turbulence potential and Cumulonimbus cloud forecasts via the WAFC London Performance Indicators webpage;
- Inclusion of verification data for harmonized WAFS gridded upper air forecasts for Icing potential via the WAFC Washington webpage;
- The WAFC Provider's will continue to issue SIGWX forecasts in BUFR format using BUFR Edition 3; there are no current plans to migrate to BUFR Edition 4;
- WAFC backup tests, conducted quarterly
- 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) is unavailable.

6.2. **Data exchange (including MET/IE WG Report)**

WP/14 – Cessation of SADIS 2G – 1200 UTC, 31 July 2016

6.2.1. 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, which will occur at 1200 UTC on 31 July 2016, and to provide advice with regard to transition from SADIS 2G to Secure SADIS FTP.

6.2.2. It would appear that the majority of SADIS users in the APAC region have transitioned, or are now actively transitioning, to the Secure SADIS FTP service.

6.2.3. Nonetheless, SADIS user States, and SADIS users are encouraged to confirm that their systems are fully configured to use Secure SADIS FTP in advance of the cessation of SADIS 2G. It had previously been recommended that the transition should have been completed and that SADIS 2G is not being used operationally after 1 June 2016. With that date now having passed, it is strongly recommended that those users who have not yet implemented transition arrangements do so without further delay. This will prevent any last minute problems when the satellite signal is terminated on 31 July 2016. In light of the above, the meeting adopted the following Decision:

<b>MET SG/20 Decision 20/6</b> – SADIS user States and SADIS users to prepare for cessation of SADIS 2G	
What: SADIS users confirm the nature of their SADIS service and, where necessary, ensure that they are prepared for the cessation of SADIS 2G and, if not already done so, urgently undertake actions to migrate to the Secure SADIS FTP service.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: The cessation of the SADIS 2G service will occur at 1200 UTC on 31 July 2016.	
When: 31-Jul-16	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: SADIS users	

*Note: Although the SADIS 2G service will continue until 31 July 2016, it had previously been recommended that user's transitions are complete and that SADIS 2G is not being used operationally after 1 June 2016.*

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

6.2.4. As discussed under WP/13, the MET Panel - MET Operations Group (MOG) has been designated to provide oversight of the future development of the SADIS.

6.2.5. The meeting reviewed information on the following developments:

- Cessation of the SADIS, 1200 UTC, 31 July 2016 (discussed under WP/14);
- Increase of Secure SADIS FTP Individual client connections limit;
- SADIS Gateway mid-life upgrade;
- Deletion of redundant files/folders from Secure SADIS FTP;
- New definition of the SADIS acronym; following the withdrawal of the satellite component of the service, the current definition for SADIS becomes a misnomer. Accordingly, the WG-MOG/1 meeting endorsed the re-definition of the service to be 'Secure Aviation Data Information Service', which permits ongoing use of the 'SADIS' acronym. The new definition will be effective 1 August 2016.
- Provision of additional flight levels to WAFS Upper Air Forecasts; and
- Access to Internet based services (Secure SADIS FTP/WIFS); as discussed under WP/14.

WP/16 – Review outcomes from MET/IE WG/14 (presented by MET/IE WG Chairperson via online audio and screen sharing)

6.2.6. The MET/IE WG/14 meeting was convened following the establishment of the group to replace the former ROBEX WG (MET SG Decision 19/2 refers). A conjoint session was held with the MET/S WG/6 to discuss items of interest to both groups.

6.2.7. Tasks completed by the MET/IE WG related to the administration of WIFS user details in the APAC region, development of a Draft Conclusion concerning capacity building for the exchange of MET information in IWXXM form, and presentation of information to MET SG on the current status of planning and implementation by States for IWXXM and extended AMHS.

6.2.8. MET/IE WG/14 developed new tasks in accordance with its terms of reference, related to: improvements to the ROBEX Handbook and ICD; support for the planning and implementation of IWXXM and AMHS; specific liaison with Fiji in support of IWXXM implementation and OPMET monitoring activities; and ANP updates. Tasks developed in the conjoint session related to proposed amendments to tropical cyclone information in Annex 3, follow-up on SIGMET test errors and development of SIGMET Guide improvements.

6.2.9. MET/IE WG/14 revised the terms of reference and work programme, and updated the task list as provided in the attachments to WP/16. Further discussion on the work programme of all the working groups under the MET SG is provided at agenda item 9.

WP/17 – Status and plans for IWXXM and AMHS within APAC (presented by MET/IE WG Chairperson via online audio and screen sharing)

6.2.10. A survey on the status and plans for IWXXM and AMHS within the APAC Region was conducted in October 2015. Only 22 States responded to the survey. In general the responses were encouraging however it should be noted that half the States did not respond and it's likely that many of these States which did not respond will require support. Furthermore some responses appear to be inconsistent and further consultation with these States may be required to verify and/or clarify the responses.

6.2.11. Given the ICAO requirement to exchange OPMET using a globally interoperable information exchange model (IWXXM) format in support of the trend towards a SWIM environment, coupled with the current lack of preparedness by many States and the lack of clarity in the information provided by States, MET/IE WG/14 proposed that the survey be re-issued with some minor refinements including:

- Remove references to conversion of IWXXM to TAC;
- Request information on additional resources that would benefit States in implementing IWXXM and extended AMHS; and
- Request information on whether States intend to have an operational extended AMHS connection between the Meteorological Provider and the ANSP.

6.2.12. Given the limited responses received to the last survey, MET/IE WG/14 also proposed that the WMO be requested to distribute the survey through its channels to States that do not respond to the survey distributed by the ICAO.

6.2.13. The meeting was advised that discussion at the recent *workshop on implementing IWXXM for exchange of OPMET data* (Paris, France, 31 May to 2 June 2016) considered possible coordination between the ICAO APAC and EUR/NAT Regions on a revised survey to ascertain States' level of implementation of IWXXM and to request information from States on associated issues.

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

<b>MET SG/20 Decision 20/7 – IWXXM and AMHS Survey</b>	
What: Revise and recirculate the IWXXM and AMHS survey, in coordination with the ICAO EUR/NAT Region, with distribution of the survey assisted through the WMO's channels, and produce an analysis of the Regional status of implementation of IWXXM and AMHS.	Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: OPMET exchange using a globally interoperable information exchange model (IWXXM) format becomes a recommended practice with applicability of Amendment 77 to Annex 3 in November 2016; and is envisaged to become a standard with future Annex 3 amendments supporting the integration of meteorological information into the SWIM environment. To support the Regional monitoring and implementation of IWXXM, additional information from States is necessary. Responses to a previous IWXXM and AMHS survey in 2015 were limited in number and in some cases lacked sufficient clarity.	
When: Before next meeting of MET/IE WG	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: Chairperson MET/IE WG	

WP/18 – Guidelines for the implementation of OPMET data exchange using IWXXM (presented by MET/IE WG Chairperson via online audio and screen sharing)

6.2.15. The draft document *Guidelines for the Implementation of OPMET data exchange using IWXXM*, under development by METP – Working Group on Meteorological Information Exchange (WG-MIE), was presented for information and comment.

6.2.16. In particular, feedback was requested by the METP WG-MIE before 22 June 2016 on:

- Terminology used in the *Guidelines* document;
- Who will generate IWXXM within the Region (e.g., each State or RODB)?
- Where APAC Region-specific information should be recorded (e.g., in an Appendix to the *Guidelines* document or as a separate APAC Regional document)?

- Any other requirements for Regional guidance documentation; and
- Any other matters (in relation to the *Guidelines* document).

6.2.17. The *Guidelines* document stated that, given the size and character set of IWXXM messages, it will not be possible for these messages to be transmitted via AFTN. The file containing the bulletin will be compressed and FTBP (File Transfer Body Part) under extended AMHS (ATS Message Handling System) will be used to exchange IWXXM data internationally through the AFS. Therefore, the meeting noted that Regional implementation of the Annex 3 provisions for exchange of OPMET in digital form is contingent on the regional implementation of extended AMHS.

6.2.18. In view of the above, and recognizing the need to coordinate with the communication, navigation and surveillance community concerning AMHS and extended AMHS implementation, the meeting adopted the following Decision and Draft Conclusion:

<b>MET SG/20 Decision 20/8 – Coordination on implementation of extended AMHS</b>	
What: Coordinate the MET SG work programme with the other APANPIRG Sub-groups (e.g., CNS SG) with respect to the regional planning and implementation of extended AMHS services for the exchange of meteorological information in the IWXXM form.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: CNS SG monitors and facilitates the implementation of CNS systems and services in the Region including AMHS. As the regional implementation of Annex 3 provisions for exchange of OPMET in digital form is contingent on the regional implementation of extended AMHS, coordination is necessary to ensure alignment of the related MET SG and CNS SG work programmes and to avoid duplication of effort.	
When: CNS SG/20	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: Chairperson MET/IE WG	

<b>MET SG/20 Draft Conclusion 20/9 – Expedited availability of extended AMHS</b>	
What: Expedited operational status of extended AMHS services linking APAC IROGs and ROCs to APAC NOCs, and between APAC IROGs and IROGs in neighbouring Regions.	Expected impact: <input checked="" type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: It has been identified that the regional implementation of the Amendment 77 to Annex 3 provisions for exchange of meteorological information using a globally interoperable information exchange model (IWXXM) format, applicable on 10 November 2016, is contingent upon the operational availability of extended AMHS services nationally, regionally and as part of the global exchange.	

When: 10-Nov-16	Status: Draft to be adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

6.2.19. The meeting noted that discussions at the recent, 2<sup>nd</sup> meeting of the METP WG-MIE (Paris, France, 23-27 May 2016) and *workshop on implementing IWXXM* included consideration of the possible need to delay the timeframe for applicability of envisaged Standards in Annex 3 for meteorological information exchange using a globally interoperable information exchange model (IWXXM) to 2020, the role of translation centres (with respect to the conversion of TAC data into IWXXM) and the requirements for message validation of IWXXM formatted OPMET information.

IP/12 – Status and plans for IWXXM in New Zealand

6.2.20. New Zealand advised that software was being developed to translate Traditional Alphanumeric Codes (TAC) to IXXXXM, and that this was expected to become operational in 2017. Software to generate IWXXM at source is also being planned. It was noted that most users of OPMET in New Zealand are only able to handle TAC at present. The existing AFTN circuit between New Zealand and the USA is to be upgraded to an AMHS circuit in July. However, it was noted that the majority of the domestic circuits in New Zealand are still only AFTN. The meeting noted that it would be useful for States to share such information regarding the transition to IWXXM.

6.3. **MET/ATM coordination**

WP/04 – Review of MET/R WG/5

6.3.1. The MET/R WG/5 meeting was convened following the establishment of the group to replace the former MET/R TF (MET SG Decision 19/2 refers).

6.3.2. MET/R WG/5 considered greater participation by experts from the ATM sector was necessary to promote the work programme and ensure relevance of the work to the ATM community. Accordingly, MET SG/20 formulated the following Draft Conclusion:

<b>MET SG/20 Draft Conclusion 20/10 – Membership of the MET/R WG from both MET and ATM experts</b>	
What: Nominate experts for the MET/R WG from both the MET and ATM fields, and actively participate in the work programme of the MET/R WG.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: MET/R WG lacks sufficient nominated ATM experts to fully meet the terms of reference to promote coordination between the MET and ATM communities in the Region in order to carry out the specific functions delegated to the working group.	
When: 1-Nov-16	Status: Draft to be adopted by PIRG
Who: <input type="checkbox"/> Sub groups <input checked="" type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: IATA, IFALPA, IFATCA, CANSO	

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

6.3.3. MET/R WG/5 conducted a regional survey of MET information provided to support ATM in October/November 2015 and had formulated necessary follow-up action to analyse the results, noting that the response rate to the survey was limited to just 20 APAC States. A draft summary of the survey results was provided at the Appendix 1 to WP/04.

6.3.4. MET/R WG/5 reviewed information provided by States on development of MET information required to support end user systems and various coordination activities and arrangements between MET and ATM service providers.

6.3.5. The revised work programme developed by MET/R WG would facilitate progress on the other action items related the development of regional guidance for tailored MET information supporting ATM, the possible improvements to the SIGMET Guide to assist States in aligning cross-boundary SIGMET information and the identification of MET information needed to support the elements of the APAC Seamless ATM Plan, as shown at Appendix 2 to WP/04.

6.3.6. Further discussion on the work programme of all the working groups under the MET SG is provided at agenda item 9.

#### WP/17 – Review of the third meeting of VOLCEX/SG

6.3.7. The meeting reviewed outcomes from the third meeting of the ICAO APAC Volcanic Ash Exercises Steering Group (VOLCEX/SG/3), held in Bangkok, Thailand, from 14-16 March 2016. VOLCEX/SG/3 reviewed the terms of reference of the steering group, conducted a debrief on the volcanic ash exercise VOLPHIN 16/01, held in Bali, Indonesia from 16 – 17 February 2016, and planning for the next (two) ICAO APAC volcanic ash exercises to be conducted in Philippines (VOLPHIN 16/02, August 2016) and Indonesia (VOLPHIN 17/01, February 2017).

#### WP/06 – Recent progress on ICAO APAC volcanic ash exercises (VOLPHIN)

6.3.8. The meeting reviewed information on the activities of the APAC Volcanic Ash Exercises Steering Group (VOLCEX/SG), which had conducted two volcanic ash exercises in the APAC Region (VOLPHIN15/01 – Philippines, 11 August 2015; and VOLPHIN16/01 – Indonesia, 16 to 17 February 2016) and was planning the third ICAO APAC Volcanic Ash Exercise (VOLPHIN16/02 – Philippines, 18 August 2016).

6.3.9. The VOLCEX/SG has implemented the volcanic ash exercise VOLPHIN framework with cooperation from participating States and organizations concerned. Lessons learned from the exercises were being used to improve the responses to and exchange of volcanic ash information by the air traffic system in the volcanically active area of the APAC Region.

6.4. **Climatological information**

6.4.1. No discussion occurred under this agenda item.

6.5. **Governance and training**

WP/10 – Compliance with WMO and ICAO requirements for QMS, competency and qualification

6.5.1. The meeting noted information on the monitoring by WMO of the compliance with the requirements for QMS, competency and qualification of personnel for the ICAO APAC Region.

6.5.2. The number of MET service providers achieving ISO 9000 certification is growing, however, there are still some providers having difficulties to bring the implementation process to the end mostly due to resource limitations. For the APAC region, a specific problem exists with the SIDS in the SW Pacific with respect to completing the last stage - external audit by an ISO certifying body. Recent QMS training initiatives coordinated with the WMO would provide additional help for the finalization of the QMS implementation in the SW Pacific States.

6.5.3. The WMO qualification requirement for the aeronautical meteorological forecasters (AMF) included in the WMO Technical Regulations, Volume I (WMO-No. 49) will become a standard requirement as of 1 December 2016. Guidance material in the form of a "compliance flow chart" and "frequently asked questions" has been developed to facilitate States conformity with this requirement and sent to all (WMO) Members on 28 January 2016. WMO Members were requested to provide information on the status of compliance with the AMF qualification standard. Interim results of the monitoring process with WMO Member States for the ICAO APAC Region were provided at the Appendix to WP/10.

6.5.4. The meeting noted that in September 2015, ISO introduced a new QMS standard, 9001:2015, to replace the previous standard, 9001:2008. Service providers certificated to 9001:2008 will have to update their QMS by September 2018 and new applicants for certification will have to use the 9001:2015 revision of the standard. WMO was preparing an update of the guidance material on QMS implementation (WMO-No.1001 and WMO-No.1100) for publication in early 2017. Furthermore, the newly introduced regulations on the WMO Integrated Global Observing System (WIGOS) in the WMO Technical Regulations, Volume I (WMO-No. 49) and in the new WMO-No.1160, Manual on WIGOS, would require States to implement appropriate calibration and maintenance procedures as part of their QMS for aeronautical meteorological service.

WP/19 – The role of MET service providers in ATS safety management

6.5.5. The meeting reviewed the Malaysia ANS regulator's requirements concerning the role of MET service provider in ATS safety management system including the training needs for related MET technical personnel. The meeting was reminded that the notes in Annex 19 stating that MET services provided under the authority of an ATS provider were included in the scope of the ATS provider's SMS, will be removed with the Amendment 1 to Annex 19, applicable on 7 November 2019.

6.5.6. Malaysia has identified the need for safety management training for relevant MET technical personnel and has developed the following training syllabus:



**Table 3: Malaysia SMS Training Syllabus for relevant MET technical personnel**

Recipient	Training objective	Training programme content
MET technical personnel	<ol style="list-style-type: none"> <li>To familiarize trainees with ATS providers' safety policies, objectives and SSP/SMS fundamentals</li> <li>To familiarize trainees with safety concepts, hazard identification and risk management relevant to their respective roles, functions and responsibilities</li> <li>To provide an overview of safety responsibilities, including safety procedures, hazards reporting and safety performance</li> </ol>	<ul style="list-style-type: none"> <li>• SSP/SMS components and elements</li> <li>• Requirements for safety management</li> <li>• Hazards, consequences and risks</li> <li>• ATS providers' safety policies and objectives</li> <li>• ATS providers' safety reporting system(s)</li> <li>• Impact of weather on aviation</li> <li>• Hazard identification and risk management processes, ATS safety assessments including roles and responsibilities</li> <li>• ATS Safety review</li> <li>• Overview on safety data collection and analysis including safety performance indicators</li> </ul>

6.5.7. In view of the uncertainty expressed by meeting participants with respect to applicability of the SMS SARPs to the designated meteorological authority and meteorological service provider, the meeting formulated the following Draft Conclusion:

<b>MET SG/20 Draft Conclusion 20/11 – Guidance on SMS SARPs for meteorological authority and meteorological service provider</b>	
What: Guidance to facilitate States' uniform interpretation of the safety management system (SMS) SARPs with respect to their applicability to the designated meteorological authority and meteorological service provider, and to facilitate States' implementation of the relevant, applicable SMS SARPs.	Expected impact: <input checked="" type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input checked="" type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: MET SG/20 participants reported general uncertainty among States with respect to applicability of the SMS SARPs to the designated meteorological authority and meteorological service provider.	
When: 7-Nov-19	Status: Draft to be adopted by PIRG
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input type="checkbox"/> ICAO APAC RO <input checked="" type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

IP/13 – General situation of China civil aviation MET professional and technical personnel

6.5.8. The meeting was presented information on the present situation of China aeronautical meteorological professional and technical personnel, personnel qualification management and future plans.

WP/29 – Capacity building and awareness raising activities on IWXXM implementation for different stakeholders in APAC

6.5.9. Hong Kong, China discussed the need of capacity building and awareness raising activities in the APAC Region to support implementation of IWXXM for OPMET exchange, and identified four distinct levels of stakeholder categories that would be impacted by the implementation of IWXXM and would require support in the form of capacity building and awareness raising activities:

- High and middle level management (responsible for aeronautical meteorological service);
- Systems technical personnel (responsible for developing, procuring and maintaining necessary software systems);
- Information management technical personnel (responsible for the exchange, storage and use of aeronautical meteorological information); and
- End users of aeronautical meteorological information.

6.5.10. Capacity building and awareness raising activities may need to involve a diverse range of stakeholders. To address these varied needs a cascaded approach to training could be considered. Some specific capacity building activities were proposed. Furthermore, to support the implementation of IWXXM in the APAC Region, Hong Kong, China is planning to host a capacity building workshop in 2017.

6.5.11. In view of the discussion above, the meeting adopted the following decision:

<b>MET SG/20 Decision 20/12 – Capacity building initiatives to support implementation of the exchange of meteorological information in IWXXM format</b>	
<p>What: Develop a coordinated regional strategy for capacity building initiatives to support implementation of digital exchange of meteorological information taking into consideration relevant outcomes from the <i>workshop on implementing IWXXM</i>, coordination with the WMO and the METP WG-MIE, as well as consideration of the following suggestions: a) opportunities for side meetings or briefing sessions at appropriate regional meetings; b) Regional workshops*, including “train the trainer”; and c) development and distribution of education materials.</p>	<p>Expected impact:</p> <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
<p>Why: A range of capacity building and awareness raising activities would be required to support the range of stakeholders involved in the implementation of IWXXM for OPMET exchange.</p>	
<p>When: Next meeting of MET/IE WG</p>	<p>Status: Adopted by Subgroup</p>
<p>Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/IE WG</p>	

\*Note: Hong Kong, China is planning to host a capacity building workshop in 2017.

**6.6. Other**

6.6.1. No discussion occurred under this agenda item.

**7. REGIONAL GUIDANCE MATERIAL**WP/20 – Review SIGMET Guide

7.1. Ongoing development of the SIGMET Guide comes under the terms of reference of the MET SG and its contributory working groups. Future amendments will require alignment of the SIGMET Guide with Amendment 77 to Annex 3 and additional improvements to assist States with alignment of SIGMET information across boundaries of responsibility. The meeting reviewed the work plan of the working groups associated with the development of SIGMET Guide amendments, noting that Amendment 77 to Annex 3 will become applicable on 10 November 2016, and reviewed preliminary draft amendments to assist States in aligning SIGMET information between neighbouring MWOs' areas of responsibility as provided at the Attachment to WP/20.

7.2. Based on suggestions provided in the meeting, the meeting adopted the following Decision to update the work programme related to SIGMET Guide updates:

<b>MET SG/20 Decision 20/13 – SIGMET Guide updates</b>	
What: Consider inclusion of procedures and/or examples for SIGMET information to be provided in volcanic ash exercises in the draft SIGMET Guide updates.	Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: The Regional SIGMET Guide provides procedures and examples for SIGMET tests and VAAC backup tests, but does not provide specific guidance related to the issuance of SIGMET in ICAO volcanic ash exercises.	
When: 10-Nov-16	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/S WG	

7.3. In response to a query on the implementation of the Annex 3 detailed criteria related to SIGMET information for thunderstorm phenomena when categorized as ‘obscured’, ‘embedded’, ‘frequent’ and ‘squall line’, it was evident that States’ interpretation of the provisions was not harmonized. Furthermore, the meeting was reminded that this issue was the subject of work also underway in the ICAO EUR/NAT Region and the METP – WG MISD, and therefore the meeting agreed to the following Decision:

<b>MET SG/20 Decision 20/14 – SIGMET issuance procedures for thunderstorm</b>	
What: In coordination with the METP and other ICAO Regions, monitor and facilitate the transfer of information on States’ national procedures for implementation of the detailed criteria related to SIGMET information for thunderstorm phenomena when	Expected impact: <input type="checkbox"/> Political / Global <input checked="" type="checkbox"/> Inter-regional

categorized as ‘obscured’, ‘embedded’, ‘frequent’ and ‘squall line’.	<input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: States’ interpretation of the detailed criteria related to SIGMET information for thunderstorm phenomena was not harmonized.	
When: 10-Nov-16	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/S WG	

WP/22 – WV SIGMET pamphlet

7.4. The meeting reviewed the draft volcanic ash (WV) SIGMET pamphlet developed by the designated ad hoc group to provide a ready reference guide to help improve the format of SIGMET messages issued in the APAC Region for volcanic ash.

7.5. Noting that, as with the other similar SIGMET pamphlets produced by the ad hoc group, the WV SIGMET pamphlet was complementary guidance to the Annex 3 SARPs and the regional ANP requirements, and the Regional SIGMET Guide, the meeting adopted the following Decision:

<b>MET SG/20 Decision 20/15 – SIGMET pamphlet for volcanic ash</b>	
What: Distribute the ‘WV SIGMET’ pamphlet provided at WP/22 for use by States as regional guidance material to facilitate improved format of SIGMET information for volcanic ash issued by the designated MWOs.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: SIGMET pamphlets were developed to provide ready reference guidance to States to help improve the format of SIGMET messages; the WV SIGMET pamphlet was developed as complementary guidance to the Annex 3 SARPs, Regional ANP requirements and the Regional SIGMET Guide specifically for SIGMET information for volcanic ash.	
When: 10-Nov-16	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input type="checkbox"/> Other:	

*Note: The new WV SIGMET pamphlet should be made available electronically on the ICAO APAC website.*

WP/21 – SIGMET pamphlet updates for Amendment 77 to Annex 3

7.6. In addition to the discussion above, the meeting reviewed the three draft SIGMET pamphlets provided by the designated ad hoc group: one for phenomena other than tropical cyclone and volcanic ash (i.e., WS SIGMET); one for tropical cyclone (i.e., WC SIGMET); and one for volcanic ash (i.e., WV SIGMET), which had been revised to align with Amendment 77 to Annex 3. The meeting noted that a final revision of the three draft pamphlets was required in order for them to be ready for use by States in time for applicability of Amendment 77 to Annex 3 on 10 November 2016. In view of the above, the meeting adopted the following Decision:

<b>MET SG/20 Decision 20/16</b> – SIGMET pamphlet updates for Amendment 77 to Annex 3	
What: Distribute the WS, WC and WV SIGMET pamphlets provided at WP/21 for use by States as regional guidance material to facilitate improved format of SIGMET information aligned with Amendment 77 to Annex 3, following completion of the final revisions of the pamphlets based on feedback provided before 30 June 2016.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: SIGMET pamphlets were developed to provide ready reference guidance to States, which was complementary to the Annex 3 SARPs, Regional ANP requirements and the Regional SIGMET Guide, to help improve the format of SIGMET messages. The SIGMET pamphlets required revision to align with Amendment 77 to Annex 3, applicable on 10 November 2016.	
When: 10-Nov-16	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: Ad hoc group	

WP/26 – Review draft regional guidance on aerodrome tsunami warning

7.7. The meeting noted that the designated ad hoc group for development of guidance for aerodrome tsunami warnings had further revised the draft *Asia/Pacific Regional Guidance on Integration of Aerodrome Tsunami Warnings into the National Tsunami Warning Systems for Public*, based on additional feedback provided by States. The meeting agreed that further feedback could be provided to facilitate final revisions by the ad hoc group on the latest draft, which should then be forwarded for review and possible further action by APANPIRG. In view of the discussion above, the meeting adopted the following Decision and Draft Conclusion:

<b>MET SG/20 Decision 20/17</b> – Revision of draft regional guidance on aerodrome tsunami warning	
What: Complete the final revision of the draft <i>Asia/Pacific Regional Guidance on Aerodrome Tsunami Warnings and their integration into the National Public Safety Plans for Tsunami</i> , provided in WP/26, and forward to APANPIRG for possible endorsement as regional guidance material.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: In accordance with Annex 3 specifications, aerodrome warnings shall be issued where required by operators or aerodrome services, and shall be disseminated in accordance with local arrangements to those concerned. Furthermore, aerodrome warnings should relate to the occurrence or expected occurrence of phenomena including tsunami. Amendment 77 to Annex 3, applicable on 10 November 2016 will introduce the note that aerodrome warnings related to the occurrence or expected occurrence of tsunami are not required where a national public safety plan for tsunami is integrated with the “at risk” aerodrome concerned.	
When: 9-Jul-16	Status: Adopted by Subgroup
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: Ad hoc group	

<b>MET SG/20 Draft Conclusion 20/18</b> – Endorsement of draft regional guidance on aerodrome tsunami warning	
What: Endorse the <i>Asia/Pacific Regional Guidance on Aerodrome Tsunami Warnings and their integration into the National Public Safety Plans for Tsunami</i> as regional guidance material for use by States.	Expected impact: <input checked="" type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Draft guidance material was developed to support implementation of Annex 3 provisions related to aerodrome tsunami warning. In accordance with Annex 3 specifications, aerodrome warnings shall be issued where required by operators or aerodrome services, and shall be disseminated in accordance with local arrangements to those concerned. Furthermore, aerodrome warnings should relate to the occurrence or expected occurrence of phenomena including tsunami. Amendment 77 to Annex 3, applicable on 10 November 2016 will introduce a note that aerodrome warnings related to the occurrence or expected occurrence of tsunami are not required where a national public safety plan for tsunami is integrated with the “at risk” aerodrome concerned.	
When: 10-Nov-16	Status: Draft to be adopted by PIRG
Who: <input type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: Ad hoc group	

*Note: The regional guidance material, if endorsed, should be made available electronically on the ICAO APAC website.*

## 8. FUTURE WORK PROGRAMME

### WP/27 – Review MET SG terms of reference

8.1. The meeting reviewed the terms of reference as agreed at APANPIRG/26 and considered that the main attributes of the MET SG were covered in the terms of reference. A copy is provided at the **Appendix 2** to this paper.

### WP/28 – Review MET SG work programme

8.2. With consideration to the terms of reference, and to discussions in the meeting concerning the work to be conducted under the MET SG, the meeting reviewed the work plan for the MET SG in the context of tasks designated to meet the deliverables described in the terms of reference. A copy of the revised MET SG work programme is provided at the **Appendix 3** to this paper.

8.3. In view of the discussions above, the meeting adopted the following Decisions:

<b>MET SG/20 Decision 20/19</b> – Terms of reference and work programme of the MET SG and the contributory working groups and steering group under the MET SG	
What: Adopt the terms of reference and work programme provided at the Appendixes 2 and 3 to this Report, ensure the tasks delegated to the MET/IE WG, MET/S WG, MET/R WG and VOLCEX/SG are aligned with the major deliverables set out in the	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional

MET SG terms of reference, and review and coordinate the respective terms of reference and work programmes of the MET/IE WG, MET/S WG, MET/R WG and VOLCEX/SG to ensure that project management principles are applied where appropriate.	<input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: A review of the terms of reference and work programme of the MET SG and its contributory groups is necessary to ensure alignment with the broader work programme of the APANPIRG.	
When: 8-Aug-16	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/IE WG, MET/S WG, MET/R WG and VOLCEX/SG	

## 9. ANY OTHER BUSINESS

### Coordination with Pacific Island States

9.1. Following discussion raised in the meeting concerning the lack of engagement with Pacific Island States in the MET SG forum, the meeting adopted the following Decision:

<b>MET SG/20 Decision 20/20 – Improved coordination with Pacific Island States</b>	
What: Revise the MET SG terms of reference and work programme as necessary to include specific references to coordination with the Pacific Islands Aviation Weather Services Panel (PIAWS) on issues common to the business of both forums, including: a) sharing relevant meeting reports and work progress reports; and b) establishing mutual points of contact and possibly extending invitations to the respective Chairpersons for mutual membership of MET SG and PIAWS.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: There was a lack of sustained, effective engagement with Pacific Island States in the MET SG forum.	
When: 8-Aug-16	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/IE WG, MET/S WG, MET/R WG and VOLCEX/SG	

9.2. The meeting noted the ICAO ‘No Country Left Behind’ (NCLB) initiative and suggested that it may be appropriate to consider the coordination proposed above within the context of NCLB.

### Environmental issues related to the MET SG work programme

9.3. Referring to Conclusion APANPIRG/26/63 – *International Aviation and Climate Change*, although the follow-up action for APANPIRG was considered complete (as discussed in WP/03), the meeting noted that the MET SG work programme did not list any specific task/s related to environmental initiatives. Furthermore, the meeting considered that it would be appropriate under the existing terms of reference to include specific coordination with the WMO in the work programme of the MET SG to promote information sharing on the impacts of climate change on aviation. In view of the discussion, the meeting agreed to the following Decision:

<b>MET SG/20 Decision 20/21</b> – Promote information sharing on the impacts of climate change on aviation	
What: Revise the MET SG work programme as necessary, in accordance with the terms of reference, to include specific coordination with the WMO to promote information sharing on the impacts of climate change on aviation.	Expected impact: <input type="checkbox"/> Political / Global <input type="checkbox"/> Inter-regional <input type="checkbox"/> Economic <input type="checkbox"/> Environmental <input checked="" type="checkbox"/> Ops/Technical
Why: Although included in the terms of reference, the work programme of the MET SG did not list any specific task/s related to environmental initiatives.	
When: 8-Aug-16	Status: Adopted by Subgroup
Who: <input checked="" type="checkbox"/> Sub groups <input type="checkbox"/> APAC States <input checked="" type="checkbox"/> ICAO APAC RO <input type="checkbox"/> ICAO HQ <input checked="" type="checkbox"/> Other: MET/IE WG, MET/S WG, MET/R WG and VOLCEX/SG	

Election of Chairperson and Vice-Chairperson

9.4. Further to the previous discussion under Agenda Item 2: Organizational Matters, and noting that the 4-year term of the current Chairperson (and Vice-Chairperson) is due for completion in 2017, the meeting agreed to include in the agenda for the next meeting the election of Chairperson and Vice-Chairperson, and to request nominations from suitable experts to be submitted no later than 2 months prior to the next meeting. While the meeting noted that some general principles for election of Chairperson/Vice-Chairperson are provided in the *APANPIRG Procedural Handbook*, more detailed guidance material from the ICAO EUR/NAT Region was presented in Flimsy 2 and it was suggested that this could be used as reference when electing the new Chairperson/Vice-Chairperson at the next meeting.

Next meeting

9.5. The dates for the next meeting, MET SG/21, were tentatively agreed as 29 May to 1 June 2017.

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**ASIA/PAC ANP, VOLUME II****PART V – METEOROLOGY (MET)****1. INTRODUCTION**

1.1 This part of the APAC 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 and Pacific Regions, 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 and Pacific Regions, 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<sup>1</sup> 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 and Pacific Regions.

*Forecasts*

2.4 In the Asia and Pacific Regions, an aerodrome forecast, issued as a TAF, should be for the aerodromes indicated in **Table MET II-2**.

2.5 In the Asia and Pacific Regions, the period of validity of a routine TAF should be of 12-, 18-, 24- or 30-hours to meet the requirements indicated in **Table MET II-2**.

2.6 In the Asia and Pacific Regions, 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 and Pacific Regions, 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 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 and Pacific Regions (namely Bangkok, Brisbane, Nadi, Singapore and Tokyo) and to

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<sup>1</sup> Refer to Table AOP II-1, Explanation of the table

the centres designated for the operation of the aeronautical fixed service satellite distribution system (SADIS 2G) and the Internet-based service (Secure SADIS FTP) and WIFS in the Asia and Pacific Regions.

2.9 SIGMET messages should be disseminated to other meteorological offices in the Asia and Pacific Regions in accordance with the regional OPMET bulletin exchange scheme.

2.10 Special air-reports that do not warrant the issuance of a SIGMET should be disseminated to other meteorological offices in the Asia and Pacific Regions in accordance with the regional OPMET bulletin exchange scheme.

2.11 In the Asia and Pacific Regions, meteorological information for use by aircraft in flight should be supplied through VOLMET broadcasts.

2.12 In the Asia and Pacific Regions, 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**

*Service for operators and flight crew members.*

3.1 In the Asia and Pacific Regions, scheduled VOLMET broadcasts should contain TAF and SIGMET.

3.2 In the Asia and Pacific Regions, 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

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
<b>Afghanistan</b>	KABUL FIR / SSR	OAKX	KABUL AD	OAKB	Y	Y	N	N
<b>Australia</b>	MELBOURNE FIR	YMMM	ADELAIDE (REGIONAL FORECASTING CENTRE)	YPRM	Y	N	N	<del>Y</del>
	BRISBANE FIR	YBBB	BRISBANE (REGIONAL FORECASTING CENTRE)	YBRF	Y	N	Y	<del>Y</del>

	BRISBANE FIR MELBOURNE FIR	YBBB YMMM	DARWIN (REGIONAL FORECASTING CENTRE)	YPDM	Y	Y	Y	NY
	MELBOURNE FIR	YMMM	HOBART (REGIONAL FORECASTING CENTRE)	YMHF	Y	N	N	NY
	BRISBANE FIR MELBOURNE FIR	YBBB YMMM	MELBOURNE (WORLD MET CENTRE, BUREAU OF METEOROLOGY)	YMMC	Y	N	N	N
	BRISBANE FIR MELBOURNE FIR	YBBB YMMM	MELBOURNE (REGIONAL FORECASTING CENTRE)	YMRF	Y	N	N	NY
	BRISBANE FIR MELBOURNE FIR	YBBB YMMM	PERTH (REGIONAL FORECASTING CENTRE)	YPRF	Y	YN	NY	NY
	BRISBANE FIR MELBOURNE FIR	YBBB YMMM	SYDNEY (REGIONAL FORECASTING CENTRE)	YSRF	Y	N	N	NY
<b>Bangladesh</b>	DHAKA FIR / SRR	VGFR	HAZRAT SHAHJALAL INTERNATIONAL AIRPORT	VGHS	Y	Y	Y	N
<b>Cambodia</b>	PHNOM PENH FIR / SRR	VDPP	PHNOM PENH	VDPP	Y	Y	Y	N
<b>China</b>	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
<b>Democratic People's Republic of Korea</b>	PYONGYANG FIR / SRR	ZKKP	SUNAN	ZKPY	Y	Y	Y	N
<b>Fiji</b>	NADI FIR / SRR	NFFF	NADI/INTL	NFFN	Y	Y	N	N
<b>French Polynesia</b>	TAHITI FIR / SRR	NTTT	TAHITI/FAAA	NTAA	Y	Y	Y	N
<b>India</b>	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
<b>Indonesia</b>	JAKARTA FIR/UIR / SRR	<del>WJFF</del> WJIZ	JAKARTA/SOEKARNO-HATTA (COMM CENTER)	WIII	Y	Y	Y	N
	UJUNG PANDANG FIR/UIR / SRR	<del>WAAF</del> WAAZ	UJUNG PANDANG/HASANUDDIN (COMM CENTER)	WAAA	Y	Y	Y	N
<b>Japan</b>	FUKUOKA FIR / TOKYO SRR	RJJJ	TOKYO (CITY)	RJTD	Y	Y	Y	N
<b>Lao People's Democratic Republic</b>	VIENTIANE FIR / SRR	VLVT	VIENTIANE/WATTAY	VLVT	Y	Y	Y	N
<b>Malaysia</b>	KOTA KINABALU FIR / SRR KUALA LUMPUR FIR / SRR	WBFC WMFC	SEPANG/KL INTL AIRPORT	WMKK	Y	Y	Y	N
<b>Maldives</b>	MALE FIR / SRR	VRMF	MALE/INTL	VRMM	Y	Y	Y	N

<b>Mongolia</b>	ULAANBAATAR FIR / SRR	ZMUB	ULAANBAATAR	ZMUB	Y	Y	N	N
<b>Myanmar</b>	YANGON FIR / SRR	VYYY	YANGON INTL	VYYY	Y	Y	Y	N
<b>Nauru</b>	NAURU FIR / SRR	ANAU	NAURU I.	ANYN	Y	Y	Y	N
<b>Nepal</b>	KATHMANDU FIR / SRR	VNSM	KATHMANDU	VNKT	Y	Y	N	N
<b>New Zealand</b>	AUCKLAND OCEANIC FIR / SRR NEW ZEALAND FIR / SRR	NZZO NZZC	WELLINGTON (AVIATION WEATHER CENTRE)	NZKL	Y	Y	Y	N
<b>Pakistan</b>	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
<b>Papua New Guinea</b>	PORT MORESBY FIR / SRR	AYPY	PORT MORESBY INTL	AYPY	Y	Y	Y	N
<b>Philippines</b>	MANILA FIR / SRR	RPHI	MANILA/NINYO AQUINO INTL, PASAY CITY, METRO MANILA	RPLL	Y	Y	Y	N
<b>Republic of Korea</b>	INCHEON FIR / SRR	RKRR	INCHEON	RKSI	Y	Y	Y	N
<b>Singapore</b>	SINGAPORE FIR / SRR	WSJC	SINGAPORE/CHANGI	WSSS	Y	Y	Y	N
<b>Solomon Islands</b>	HONIARA FIR / SRR	AGGG	HONIARA (HENDERSON)	AGGH	Y	Y	Y	N
<b>Sri Lanka</b>	COLOMBO FIR / SRR	VCBI	BANDARANAIKE INTL AIRPORT COLOMBO	VCBI	Y	Y	Y	N
<b>Thailand</b>	BANGKOK FIR / SRR	VTBB	BANGKOK/SUVARNABHUMI INTL AIRPORT	VTBS	Y	Y	Y	N
<b>United States</b>	ANCHORAGE FIR	PAZA	ANCHORAGE	PAWU	Y	N	Y	N
	OAKLAND OCEANIC / HONOLULU SRR	KZAK	HONOLULU	PHFO	Y	Y	Y	N
	OAKLAND OCEANIC FIR	KZAK	KANSAS CITY	KKCI	Y	N	Y	N
<b>Viet Nam</b>	HANOI FIR / SRR HO-CHI-MINH FIR / SRR	VVNB VVTS	GIA LAM	VVGL	Y	Y	Y	N

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**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 aerodrome (listed in Tables AOP) 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 aerodrome (listed in Tables AOP)
- 4 Designation of the aerodrome (listed in Tables AOP):  
 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  
 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

State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
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		N	T		F
	BRISBANE/BRISBANE INTL	YBBN	RS	BRISBANE/BRISBANE INTL	YBBN	Y		Y	X		F
	CAIRNS/CAIRNS INTL	YBCS	RS	CAIRNS/CAIRNS INTL	YBTL	Y		Y	T		F
	CHRISTMAS ISLAND	YPXM	RS	PERTH/PERTH INTL	YPPH	Y		N	T		F
	COCOS (KEELING) ISLANDS INTL	YPCC	RS	PERTH/PERTH INTL	YPPH	Y		N	T		F
	DARWIN/DARWIN INTL	YPDN	RS	DARWIN/DARWIN INTL	YPDN	Y		Y	X		F
	HOBART	YMHB	RS	HOBART	YMHB	Y		N	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		N	T		F
	PERTH/PERTH INTL	YPPH	RS	PERTH/PERTH INTL	YPPH	Y		Y	X		F
	PORT HEDLAND	YPPD	RS	PERTH/PERTH INTL	YPPH	Y		N	T		F
	ROCKHAMPTON	YBRK	AS	BRISBANE/BRISBANE INTL	YBBN	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

State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
1	2	3	4	5	6	7	8	9	10	11	12
	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	ZSJM	RS	SHANGHAI/HONGQIAO	ZSSS	Y			T		F
	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	RN S	CHENGDU/SHUANGLIU	ZUUU	Y					F
<b>Cook Islands</b>	RAROTONGA INTL.	NCRG	RS	NADI/INTL	NFFN	Y			T		F
<b>Democratic People's Republic of Korea</b>	SUNAN	ZKPY	RS	SUNAN	ZKPY	Y		Y	T		F
<b>Fiji</b>	NADI/INTL	NFFN	RS	NADI/INTL	NFFN	Y		Y	T		F
	NAUSORI/INTL	NFNA	RS	NADI/INTL	NFFN	Y			T		F
<b>French Polynesia (France)</b>	TAHITI FAAA	NTAA	RS	TAHITI FAAA	NTAA	Y		Y	T		F



State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
1	2	3	4	5	6	7	8	9	10	11	12
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
	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	RN S	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	RN S	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	RN S	MAKASSAR/SULTAN HASANUDDIN	WAAA	Y		Y	X		F

State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
1	2	3	4	5	6	7	8	9	10	11	12
	MANADO/SAMRATULANGI	WAMM	RS	MANADO/SAMRATULANGI	WAMM	Y			X		F
	MEDAN/KUALANAMU	WIMM	RS	MEDAN/KUALANAMU	WIMM	Y		Y	T		F
	MERAUKE/MOPAH	WAKK	RN S	JAYAPURA/SENTANI	WAJJ	Y			T		P
	PALEMBANG/SULTAN MAHMUD BADARUDDIN II	WIPP	RN S	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
<b>Japan</b>	CHUBU CENTRAIR INTL	RJGG	RS	TOKYO (CITY)	RJTD	Y		Y	X		F
	FUKUOKA	RJFF	RS	TOKYO (CITY)	RJTD	Y			X		F
	HAKODATE	RJCH	AS	TOKYO (CITY)	RJTD	Y			X		F
	HIROSHIMA	RJOA	RS	TOKYO (CITY)	RJTD	Y			X		F
	KAGOSHIMA	RJFK	RS	TOKYO (CITY)	RJTD	Y			X		F
	KANSAI INTL	RJBB	RS	TOKYO (CITY)	RJTD	Y		Y	X		F
	KUMAMOTO	RJFT	RS	TOKYO (CITY)	RJTD	Y			X		F
	NAGASAKI	RJFU	RS	TOKYO (CITY)	RJTD	Y			X		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			X		F
	OITA	RJFO	RS	TOKYO (CITY)	RJTD	Y			X		F
	OKAYAMA	RJOB	RS	TOKYO (CITY)	RJTD	Y			X		F
	OSAKA INTL	RJOO	AS	TOKYO (CITY)	RJTD	Y			X		F
	SAPPORO/NEW CHITOSE	RJCC	RS	TOKYO (CITY)	RJTD	Y			X		F
	SENDAI	RJSS	RN S	TOKYO (CITY)	RJTD	Y			X		F
	TAKAMATSU	RJOT	RS	TOKYO (CITY)	RJTD	Y			X		F
	TOKYO INTL	RJTT	AS	TOKYO (CITY)	RJTD	Y		Y	X		F
<b>Kiribati</b>	CHRISTMAS ISLAND	PLCH	RS	NADI/INTL	NFFN	Y			T		F
	TARAWA/BONRIKI INTL	NGTA	RS	NADI/INTL	NFFN	Y			T		F
<b>Lao People's Democratic Republic</b>	VIENTIANE(WATTAY)	VLVT	RS	VIENTIANE(WATTAY)	VLVT	Y		Y	T		P
<b>Macao, China (China)</b>	MACAO/INTL AIRPORT	VMMC	RS	MACAO/INTL AIRPORT	VMMC	Y		Y	X		F

State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
1	2	3	4	5	6	7	8	9	10	11	12
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		
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
	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

State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
1	2	3	4	5	6	7	8	9	10	11	12
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 BANGYO INTL	RPMD	RN S	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	RN S	MANILA/NINOY AQUINO INTL	RPLL	Y		Y	T		P
ZAMBOANGA INTL	RPMZ	RN S	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

State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
1	2	3	4	5	6	7	8	9	10	11	12
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	
Sri Lanka	HINGURAKGODA/MINNERIYA	VCCH	RS	KATUNAYAKE/BANDARANAIKE INTERNATIONAL AIRPORT	VCBI	Y	Y	X		F	
	KATUNAYAKE/BANDARANAIKE INTERNATIONAL AIRPORT	VCBI	RS	KATUNAYAKE/BANDARANAIKE INTERNATIONAL AIRPORT	VCBI	Y	Y	X		F	
	COLOMBO	VCRI	RS	COLOMBO	VCRI	Y	Y	X		F	
Thailand	MATTALA/MATTALA	VCRI	RS	MATTALA/MATTALA	VCRI	Y	Y	X		F	
	RAJAPAKSA INTERNATIONAL AIRPORT	VCRI	RS	RAJAPAKSA INTERNATIONAL AIRPORT	VCRI	Y	Y	X		F	
	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	VTTP	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	

State	Aerodrome (listed in Tables AOP) where meteorological service is to be provided			Responsible aerodrome meteorological office		Observations and forecasts to be provided					METAR/SPECI and TAF availability
	Name	ICAO Location Indicator	Use	Name	ICAO Location Indicator	State of the runway METAR/SPECI	Trend forecast	TAF	Temperature Tx/Tn		
1	2	3	4	5	6	7	8	9	10	11	12
	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
	KAHULULU, 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
<b>Vanuatu</b>	PORT VILA/BAUERFIELD	NVVV	RS	PORT VILA/BAUERFIELD	NVVV	Y			T		F
	SANTO/PEKOA	NVSS	RS	PORT VILA/BAUERFIELD	NVVV	Y			T		F
<b>Viet Nam</b>	CAM RANH	VVCR	RS	CAM RANH	VVCR	Y		Y	T		F
	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
<b>Wallis and Futuna Islands (France)</b>	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.

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

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

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

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

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



The Objectives of the MET/SG are to:

- 1) Ensure the continuous and coherent development of the MET parts of the Asia/Pacific Regional Air Navigation Plan (APAC ANP) in a manner that is harmonized with adjacent regions, consistent with ICAO SARPs, the Global Air Navigation Plan and the Global Aviation Safety Plan;
- 2) Facilitate the implementation of aeronautical meteorological services identified in the APAC ANP, Aviation System Block Upgrade (ASBU) priority modules and the Asia/Pacific Seamless ATM Plan elements using the project management principles where appropriate; and
- 3) Review, identify and address deficiencies that impede the implementation or provision of effective and efficient aeronautical meteorological services in the Asia and Pacific Regions.

Deliverables to meet the Objectives:

- 1) Progress report to be submitted to APANPIRG addressing the MET SG deliverables (listed in 2 to 9 below);
- 2) MET parts of the ASIA/PAC ANP to be reviewed and, as necessary, amendment proposals prepared to update the APAC ANP to reflect changes in the operational and global requirements;
- 3) Level of implementation of aeronautical meteorological services to be monitored and, as necessary, facilitated to support the effective implementation of ASBU priority modules and the Asia/Pacific Seamless ATM Plan elements;
- 4) Air navigation deficiencies in the field of MET to be identified (which may require any necessary systems performance monitoring to be facilitated) and, where necessary, appropriate corrective action proposed and the development and implementation of action plans by States to resolve identified deficiencies facilitated;
- 5) Air navigation deficiencies in the field of MET (as listed in the APANPIRG database) to be reviewed and, as necessary, updated to reflect the current situation;
- 6) Research and development, trials and demonstrations in the field of MET and other relevant areas to be monitored and, as necessary, the transfer of this information and expertise between States facilitated;
- 7) Specific recommendations to be made, and guidance materials developed, aimed at improving aeronautical meteorological services by the use of existing and/or new procedures, facilities and technologies;
- 8) Inter-regional and intra-regional co-ordination issues in the field of MET to be reviewed and identified and, as necessary, actions recommended addressing those issues;
- 9) MET environmental initiatives are consistently identified and progressed; and
- 10) Draft Conclusions and Decisions to be formulated relating to matters in the field of MET that come within the scope of the APANPIRG work plan.

MET SG/20  
Appendix 3 to the Report

High-level MET SG Deliverable	Responsibility	Target date	Status
1) Progress report to be submitted to APANPIRG addressing the MET SG deliverables (listed in 2 to 9 below).	Chair	22/08/2016	IN PROGRESS
2) MET parts of the ASIA/PAC ANP to be reviewed and, as necessary, amendment proposals prepared to update the APAC ANP to reflect changes in the operational and global requirements.	MET/IE WG (Task 4) MET SG	NOT SPECIFIED TBC	
3) Level of implementation of aeronautical meteorological services to be monitored and, as necessary, facilitated to support the effective implementation of ASBU priority modules and the Asia/Pacific Seamless ATM Plan elements.	MET/S WG (Task 1) MET/S WG (Task 3) MET/S WG (Task 7) MET/IE WG (Task 1) MET/IE WG (Task 2) MET/IE WG (Task 5) VOLCEX/SG (Milestone 3) VOLCEX/SG (Milestone 4) VOLCEX/SG (Milestone 5) TBC (Decision 20/5)	2016-2019 2016-2018 2016-2019 NOT SPECIFIED NOT SPECIFIED 2016-2018 Aug 2016 Feb 2017 2017 TBC	
4) Air navigation deficiencies in the field of MET to be identified (which may require any necessary systems performance monitoring to be facilitated) and, where necessary, appropriate corrective action proposed and the development and implementation of action plans by States to resolve identified deficiencies facilitated.	MET/S WG (Task 2) MET/IE WG (Task 3)	2016-2018 NOT SPECIFIED	
5) Air navigation deficiencies in the field of MET (as listed in the APANPIRG database) to be reviewed and, as necessary, updated to reflect the current situation.	MET/S WG (Task 2) MET/S WG (Task 6) MET SG	2016-2018 2016 22/08/2016	
6) Research and development, trials and demonstrations in the field of MET and other relevant areas to be monitored and, as necessary, the transfer of this information and expertise between States facilitated.	MET/R WG (Deliverable 2) MET/R WG (Deliverable 5)	2016-2017 2016-2017	
7) Specific recommendations to be made, and guidance materials developed, aimed at improving aeronautical meteorological services by the use of existing and/or new procedures, facilities and technologies.	MET/S WG (Task 4) MET/R WG (Deliverable 1) MET/R WG (Deliverable 3) MET/R WG (Deliverable 4) MET/IE WG (Task 4) TBC (Decision 20/13)	2016 Jun 2016 Jul 2016 Aug 2016 NOT SPECIFIED TBC	
8) Inter-regional and intra-regional co-ordination issues in the field of MET to be reviewed and identified and, as necessary, actions recommended addressing those issues.	MET/S WG (Task 5) MET/IE WG (Task 6) TBC (Decision 20/8) TBC (Decision 20/20)	2016-2018 2017 TBC TBC	
9) MET environmental initiatives are consistently identified and progressed.	TBC (Decision 20/21)	TBC	
10) Draft Conclusions and Decisions to be formulated relating to matters in the field of MET that come within the scope of the APANPIRG work plan.	MET SG	09/06/2016	IN PROGRESS

**TWENTIETH MEETING OF THE METEOROLOGY SUB-GROUP  
(MET SG/20) OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING AND IMPLEMENTATION  
REGIONAL GROUP (APANPIRG)**

(Bangkok, Thailand, 6 – 9 June 2016)

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*International Civil Aviation Organization*

**TWENTIETH MEETING OF THE METEOROLOGY SUB-GROUP  
(MET SG/20) OF THE ASIA/PACIFIC AIR NAVIGATION PLANNING  
AND IMPLEMENTATION REGIONAL GROUP (APANPIRG)**

*Bangkok, Thailand, 6 – 9 June 2016*

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#### **PRESENTATION**

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#### **FLIMSIES**

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