



International Civil Aviation Organization

WORKING PAPER

**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

**Agenda Item 6.2: Research, development and implementation issues in the MET field
Data exchange (including MET/IE WG Report)**

STATUS AND PLANS FOR IWXXM AND AMHS WITHIN APAC

(Prepared by Chair MET/IE and Presented by Secretariat)

SUMMARY

This paper describes the status and plans for the implementation of IWXXM and AMHS in Asia Pacific (APAC) region based on a survey that was conducted in late 2015. Action by the MET/IE-WG is in paragraph 5.

1. INTRODUCTION

1.1 Effective with Amendment 76 to ICAO Annex 3 – Meteorological Service for International Air Navigation (applicable Nov. 2013) exchange of METAR, SPECI, TAF and SIGMET may be done in digital form under a bilateral agreement between States in a position to do so. Amendment 77 to Annex 3 (effective Nov 2016) will make this a recommendation and will also include Volcanic Ash Advisory (VAA), Tropical Cyclone Advisory (TCA) and AIRMET in IWXXM format. It is envisaged that OPMET exchange in IWXXM format may become an Annex 3 Standard with Amendment 78, which is likely to become effective in November 2018 (rather than 2019).

1.2 The World Meteorological Organization (WMO) formed a Task Team on Aviation XML (TT-AvXML) to identify the meteorological information that WMO must represent in the aviation XML standard in response to recommendations and future requirements from ICAO. The result was the development of IWXXM.

1.3 Details of IWXXM are included in the Manual on the Digital Exchange of Aeronautical Meteorological Information (ICAO Doc 10003).

1.4 Therefore by November 2018 (i.e. within the next 30 months) all States may be required to exchange XML-formatted OPMET (IWXXM).

1.5 Given the size and character set of IWXXM messages, it will not be possible for these messages to be transmitted by the Aeronautical Fixed Telecommunication Network (AFTN). Therefore, IWXXM messages will need to be transmitted over the ATS Message Handling System (AMHS). It is likely that bulletins will be compressed and transferred as File Transfer Body Part (FTBP) which commonly requires Extended AMHS (rather than Basic AMHS) configured links.

1.6 In order to assess the status and plans for implementation of both IWXXM and AMHS within Asia Pacific (APAC) a survey of States, via State letter, was conducted. Refer to Appendix A for a copy of the survey and Appendix C for a summary of responses.

2. DISCUSSION

2.1 An ICAO APAC State letter (AP 151_15) was issued to 41 States and Special Administrative Regions on the 30th September and States were requested to respond by 30th October. 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 their responses.

2.2 Of the 41 States, 22 States indicated that they were aware of the requirement to exchange OPMET information in IWXXM format by 2018 and only one State indicated that they were not aware of this requirement (Refer Figure 1).

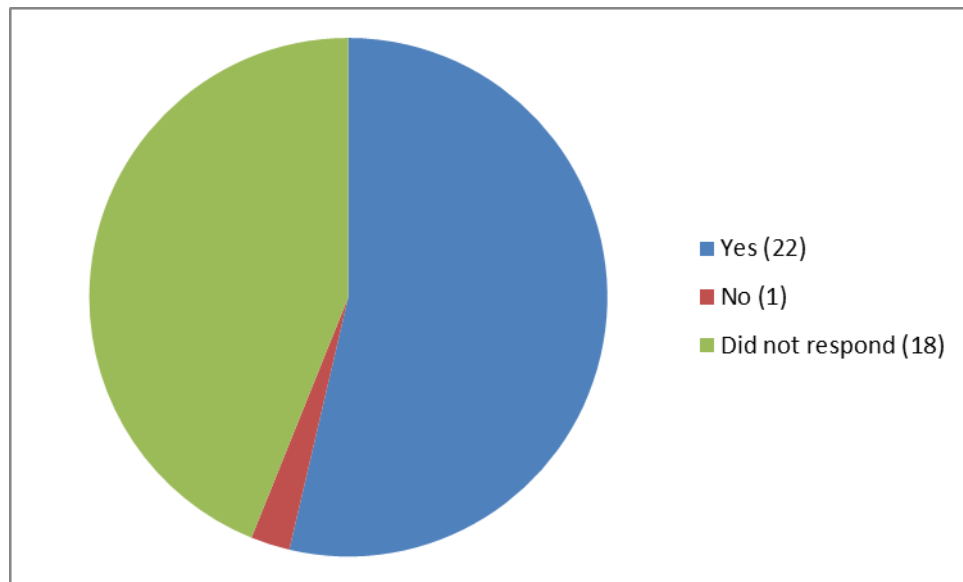


Figure 1 – Awareness of the requirement to exchange data in IWXXM format by 2018

2.3 Of the 22 responses, 3 States indicated they were operational (Bangladesh, Nepal & Pakistan), 4 were in testing (Republic of Korea, Singapore, Thailand and USA), 3 (Hong Kong China, Maldives & Philippines) were procuring a solution, 10 (Australia, China, Fiji, Indonesia, Japan, Lao DPR, Macao, Malaysia, Mongolia, New Zealand) were planning and 3 (Bhutan, Mongolia, Solomon Islands) were yet to commence (Refer Figure 2). Further clarification was recently sought from the four States that have indicated that they are operational and at the time of publishing clarification remains outstanding.

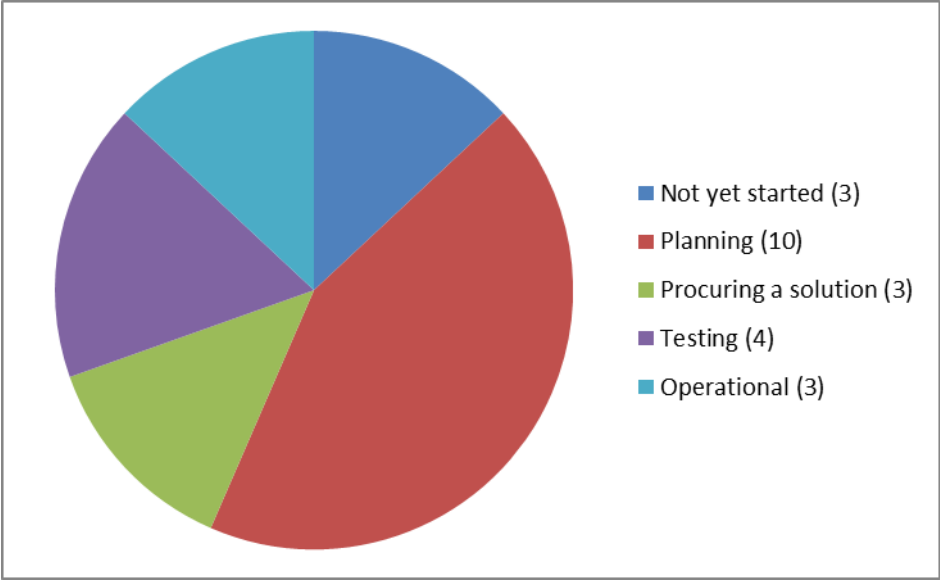


Figure 2 - Status of planning and implementation of the digital exchange of OPMET information

2.4 Question 6 of the survey prompted States to advise who within their State would be responsible for generating the IWXXM, where multiple answers were allowed. Of 23 responses, 15 indicated Meteorological Service Provider, 5 stated Air Navigation Service Provider (ANSP), 4 Regional OPMET Databank (RODB) and 3 were undermined (Refer to Figure 3).

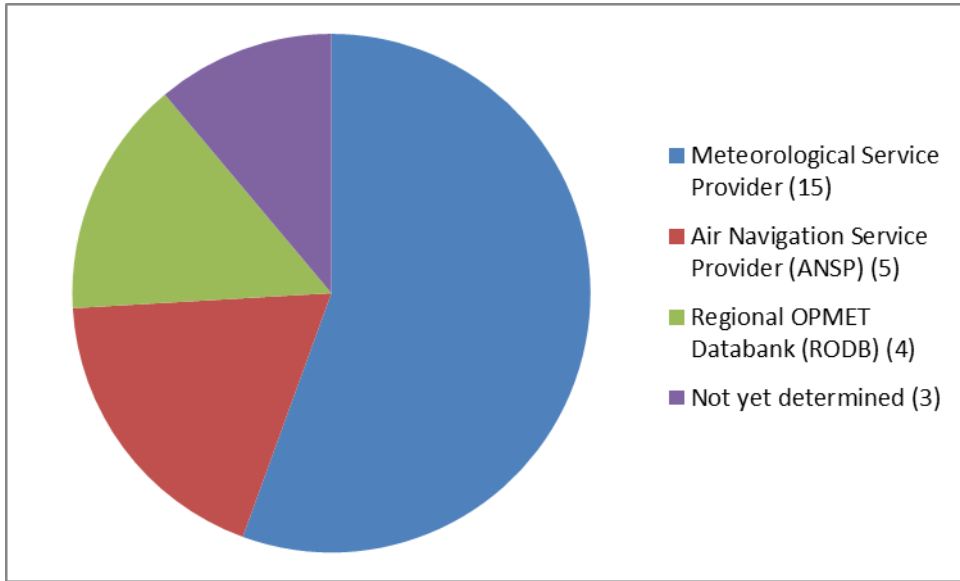


Figure 3 – Entity responsible within a State for generating IWXXM

2.5 Question 7 of the survey sought advice as to whether the AMHS connection is currently able to support Extended AMHS communications or whether it can be configured to support Extended AMHS communications. The responses indicate that 4 States AMHS currently supports Extended AMHS, 8 States AMHS can be configured to support Extended AMHS and the remaining 11 States do not support Extended AMHS or they do not have AMHS (Refer Figure 4).

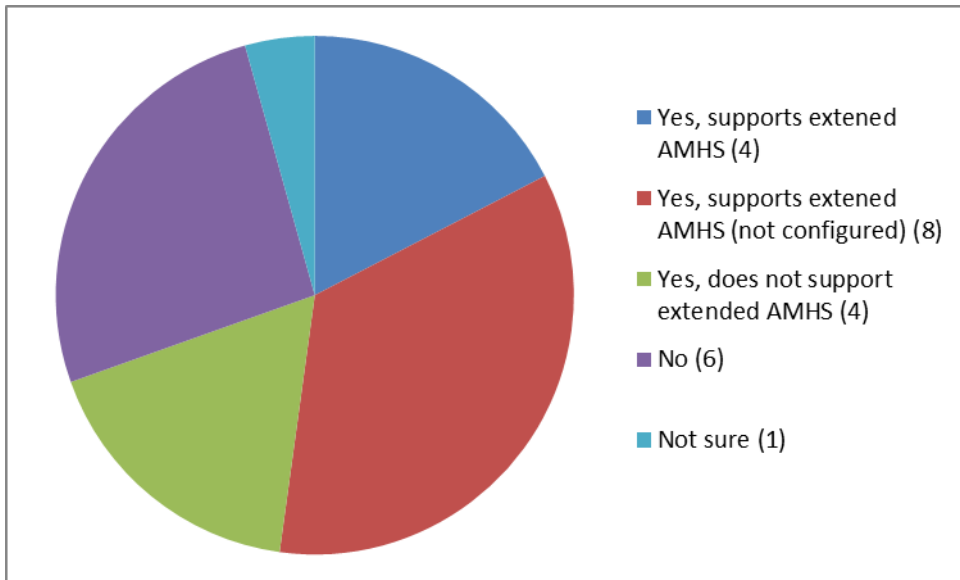


Figure 4 – Support for Extended AMHS communications

2.6 Questions 8 of the survey was designed to identify whether a State has an AMHS connection and if not when they plan to establish an AMHS connection. The responses indicate that 14

States have an existing AMHS connection, 5 States plan to establish this by 2018 and 3 are yet to be determined (Refer to Figure 5).

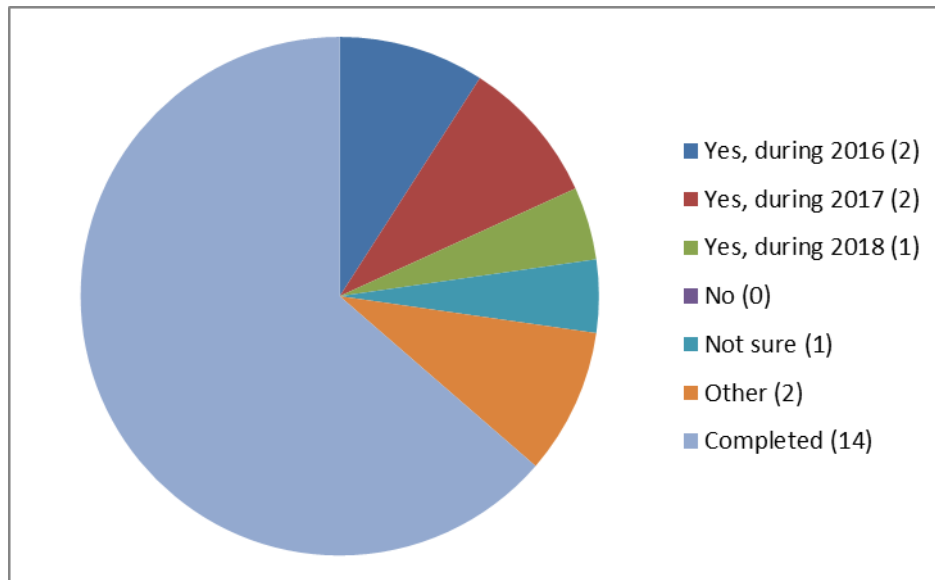


Figure 5 – Plans for implementing an AMHS connection

2.7 The survey (question 9) also sought to determine whether a State plans to convert IWXXM back to TAC. The responses indicate that 13 States plan to convert IWXXM to TAC by 2018 and the remaining 8 States are yet to decide.

2.8 It should be noted that since TAC messages are still being generated for some time, ICAO MET/P WG-MIE recommends that States should not convert IWXXM back to TAC, as there is no assurance that the conversion will create the same content as the original TAC and users have no way to identify the original TAC from converted TAC when they differ.

2.9 In summary, only half the States responded to the survey. Those that did respond are making good progress but some responses highlight that there may be some confusion about exchange in IWXXM format means and what needs to be implemented to support it. A number of States also seek greater clarity of the required solution and timing. Whilst the Guidelines for the Implementation of OPMET Data Exchange using IWXXM will assist States in understanding some of the technical aspects of what is required, a simpler user guide including options and timeframes for implementing IWXXM and AMHS would likely assist States.

2.10 Furthermore, most States have not considered how/if they will transfer IWXXM data between the Meteorological Provider and the Air Navigation Service Provider (ANSP) whom has the primary AMHS connection for the State.

3. RE-ISSUANCE OF AN UPDATED SURVEY

3.1 Given that OPMET exchange in IWXXM format may become an Annex 3 Standard with Amendment 78 (2018), the current lack of preparedness by many States and the lack of clarity by States, it is proposed that the survey be re-issued with some minor refinements. The refinements include:

- a) remove references about converting IWXXM to TAC;
- b) seek information on additional resources that would be benefit States in implementing IWXXM and AMHS;
- c) seek advice as to whether States intend to have an AMHS connection between the Meteorological Provider and the ANSP.

3.2 A proposed survey is contained in Appendix B.

3.3 Given the poor response to the last survey, it is also proposed that ICAO seek support from World Meteorological Organization (WMO) to distribute the letter directly to Meteorological Service Providers in States that do not respond to the State Letter.

4. RECOMMENDATION

4.1 It is recommended that the METSG/20 adopts the following draft Conclusions:

Draft Conclusion 20/x – IWXXM and AMHS Survey

That, the ICAO APAC Secretariat sends a State Letter requesting States to complete the survey at Appendix B prior to 15 October 2016.

Draft Conclusion 20/x – WMO Support for distribution of IWXXM and AMHS Survey

That, the ICAO APAC Secretariat seek support from WMO for distributing the IWXXM and AMHS survey (Appendix B) to the Meteorological Service Providers in States that don't respond by 15 October 2016.

5. ACTION BY THE MEETING

5.1 The meeting is invited to:

- a) note the information in this paper;
- b) review the survey contained in Appendix B;
- c) consider the draft Conclusions in paragraph 4.1;
- d) discuss any relevant matters as appropriate; and
- e) suggest any further tasks for the APAC MET/IE WG or MET/P WG-MIE to undertake.

APPENDIX A - IWXXM AND AMHS SURVEY (Adapted from APANPIRG/26 WP/10 Appendix D)

INTRODUCTION

This survey is intended to inform ICAO, and in particular the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), on the status of States’ planning and implementation of the digital exchange of meteorological information in accordance with the current (and expected future) provisions in ICAO Annex 3 — *Meteorological Service for International Air Navigation*.

In accordance with Annex 3, meteorological information if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML). The ICAO meteorological information exchange model (IWXXM) provides such a logical data model for aeronautical meteorological information in support of international air navigation.

Guidance on the information exchange model, XML/GML and the metadata profile is provided in the *Manual on the Digital Exchange of Aeronautical Meteorological Information* (Doc 10003).

It is envisaged that the digital exchange of meteorological information, formatted in accordance with the IWXXM, will be facilitated by States’ implementation of the ATS message handling system (AMHS).

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

Q2. Please provide your contact details:

Name:.....

Organisation:

Email address:

Q3. Please confirm your State’s level of awareness of developments for future provisions in ICAO Annex 3 — *Meteorological Service for International Air Navigation* that will require the international exchange of OPMET information (including SIGMET, TAF, METAR/SPECI and AIRMET) in digital form – formatted in accordance with a globally interoperable information exchange model using extensible markup language (XML)/geography markup language (GML) – as an ICAO Standard Practice, with possible applicability as early as November 2018:

a) Yes, we are aware of such developments

b) No, we are not aware of such developments

Comments (optional):

.....

- Q4. Please choose a response below to indicate the status of planning and implementation of the digital exchange of OPMET information by your State:
- a) Not yet started
 - b) Planning
 - c) Procuring a solution
 - d) Testing
 - e) Operational

Comments (optional):
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- Q5. If you answered e) Operational, above – please go to Q6. Otherwise, please indicate when operational status (of the digital exchange of OPMET information by your State) is expected (if known):
- a) Yes, during 2015
 - b) Yes, during 2016
 - c) Yes, during 2017
 - d) Yes, during 2018
 - e) Not sure
 - f) Other (please specify)

- Q6. Please choose a response below to indicate the entity/ies designated by your State to generate digital OPMET information using XML/GML (you may select more than one):
- a) Meteorological Service Provider
 - b) Air Navigation Service Provider (ANSP)
 - c) Regional OPMET Databank (RODB)
 - d) Not yet determined
 - e) Other, e.g., from another State (please specify)

- Q7. Please choose a response below to indicate whether or not your State has access to an AMHS connection for sending digital OPMET information (formatted in accordance with IWXXM) internationally:
- a) Yes, and it currently supports Extended AMHS
 - b) Yes, and it supports Extended AMHS – although this is not configured
 - c) Yes, but it does not support Extended AMHS
 - d) No
 - e) Not sure

Comments (optional):
.....

- Q8. If you answered Yes, a), b) or c), above – please go to Q9. Otherwise, please choose a response below to indicate whether or not your State has plans to implement AMHS:
- a) Yes, during 2015
 - b) Yes, during 2016
 - c) Yes, during 2017
 - d) Yes, during 2018
 - e) No
 - f) Not sure
 - g) Other (please specify)
- Q9. Please choose a response below to indicate whether or not your State’s plan for the digital exchange of meteorological information includes the conversion of OPMET information received in digital form to traditional alphanumeric code (TAC):
- a) Yes, during 2015
 - b) Yes, during 2016
 - c) Yes, during 2017
 - d) Yes, during 2018
 - e) No
 - h) Other (please specify)

Thank you for your assistance.

This space is provided for any additional comments:

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APPENDIX B – PROPOSED IWXXM AND AMHS SURVEY

INTRODUCTION

This survey is intended to inform ICAO, and in particular the Asia/Pacific Air Navigation Planning and Implementation Regional Group (APANPIRG), on the status of States’ planning and implementation of the digital exchange of meteorological information in accordance with the current (and expected future) provisions in ICAO Annex 3 — *Meteorological Service for International Air Navigation*.

In accordance with Annex 3, meteorological information if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML). The ICAO meteorological information exchange model (IWXXM) provides such a logical data model for aeronautical meteorological information in support of international air navigation.

Guidance on the information exchange model, XML/GML and the metadata profile is provided in the *Manual on the Digital Exchange of Aeronautical Meteorological Information* (Doc 10003).

It is envisaged that the digital exchange of meteorological information, formatted in accordance with the IWXXM, will be facilitated by States’ implementation of the ATS message handling system (AMHS). As IWXXM formatted OPMET will be exchanged as attachments using File Transfer Body Part (FTBP), Extended AMHS (rather than basic AMHS) will likely be required.

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

Q2. Please provide your contact details:
Name:
Organisation:
Email address:

Q3. Please confirm your State’s level of awareness of developments for future provisions in ICAO Annex 3 — *Meteorological Service for International Air Navigation* that will require the international exchange of OPMET information (including SIGMET, TAF, METAR/SPECI and AIRMET as well as VAA and TCA where generated) in digital form – formatted in accordance with a globally interoperable information exchange model using extensible markup language (XML)/geography markup language (GML) known as ICAO Weather Exchange Model (IWXXM) – as an ICAO Standard Practice, with possible applicability as early as November 2018:

- a) Yes, we are aware of such developments
- b) No, we are not aware of such developments

Comments (optional):
.....

- Q4. Please choose a response below to indicate the status of planning and implementation of the digital exchange of OPMET information by your State:
 - a) Not yet started
 - b) Planning
 - c) Procuring a solution
 - d) Testing
 - e) Operational

Comments (optional):

- Q5. If you answered e) Operational, above – please go to Q6. Otherwise, please indicate when operational status (of the exchange of OPMET information in IWXXM format by your State) is expected (if known):
 - a) Yes, during 2016
 - b) Yes, during 2017
 - c) Yes, during 2018
 - d) Not sure
 - e) Other (please specify)

- Q6. Please choose a response below to indicate the entity/ies designated by your State to generate OPMET information in IWXXM format (you may select more than one):
 - a) Meteorological Service Provider
 - b) Air Navigation Service Provider (ANSP)
 - c) Regional OPMET Databank (RODB)
 - d) Not yet determined
 - e) Other, e.g., from another State (please specify)

- Q7. Please choose a response below to indicate whether or not your State has access to an AMHS connection for sending OPMET information in IWXXM format internationally:
 - a) Yes, and it currently supports FTBP (Extended AMHS)
 - b) Yes, and it supports FTBP (Extended AMHS) – although this is not configured
 - c) Yes, but it does not support FTBP (Extended AMHS)
 - d) No
 - e) Not sure

Comments (optional):

- Q8. If you answered Yes, a) above – please go to Q9. Otherwise, please choose a response below to indicate whether or not your State has plans to implement an operational AMHS configured for FTBP (Extended services):
- a) Yes, during 2016
 - b) Yes, during 2017
 - c) Yes, during 2018
 - d) No
 - e) Not sure
 - f) Other (please specify)

- Q9. Please choose a response below to indicate if/how you plan to transfer IWXXM information between the Meteorological Service Provider and the Air Navigation Service Provider (ANSP), which has the primary AMHS connection for the State:
- a) Yes, via an existing Extended AMHS connection
 - b) Yes, via an existing AMHS connection which supports FTBP (Extended AMHS) – although this is not configured
 - c) Yes, via an existing AMHS connection which does not support FTBP (Extended AMHS)
 - d) Yes, via an AMHS connection which is yet to be installed/configured
 - e) No intent
 - f) Not sure

Comments (optional):

- Q10. Please provide details of any further information that will assist with implementing IWXXM with your State:

.....
.....
.....

Thank you for your assistance.

This space is provided for any additional comments:

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APPENDIX C – SUMMARY OF RESPONSES

Q1	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Additional Comments
Afghanistan								
Australia	a) Yes, aware of such developments	b) planning	b) Yes, during 2016	c) Regional OMET Databank (RODB)	b) Yes, and it supports Extended AMHS - although this is not configured	Nil	b) yes, during 2016	The above answers are based upon the OPMET exchange relating to METAR, SPECI, TAF and SIGMET. Airservices Australia and the Bureau of Meteorology (BOM) are discussing the future responsibilities of digital exchange of these and other OPMET products, including AIRMET, VAA and TCA, which may lead to some MET products being generated in digital form at the Bureau of Meteorology. As a consequence this may result in the AMHS connection being extended to BOM.
Bangladesh	a) Yes, aware of such developments	e) Operational	Nil	a) Meteorological Service Provider	a) Yes, and it currently supports Extended AMHS	g) Already implemented	d) Yes, during 2018	
Bhutan	a) Yes, aware of such developments	a) not yet started	f) Need to submit proposal to the Government	b) Air Navigation Service Provider (ANSP)	d) No	g) need to propose the case to the Government for approval and funding	g) need to propose the case to the Government for approval and funding	
Brunei Darussalam								
Cambodia								
China	a) Yes, aware of such developments	b) planning	d) Yes, during 2018	b) Air Navigation Service Provider (ANSP)	b) Yes, and it supports Extended AMHS - although this is not configured		d) Yes, during 2018	
Cook Islands								
Democratic People's Republic of Korea								
Fiji	a) Yes, aware of such developments Comments: Aware of such development and need to participate actively in the ICAO regional meeting on OPMET issues and align to the regional ICAO plan	b) planning	f) to be determined	e) AFI is the a) ANSP and c) RODB. Fiji Meteorological Services is a) Meteorological Service Provider	Comments: Fiji has a Comsoft AMHS System installed in 2010 that supports Extended AMHS services.	Nil	h) To be determined	In Fiji, the Fiji Meteorological Services is the Meteorological Service Provider for all local OPMET Data. Airports Fiji Limited (AFL) is designed as the provider for ANSP & RODB. AFL has installed the COMSOFT AMHS system in 2010 and is capable to support the Extended AMHS services for communication of digital data format link XML/GML. AFL & Fiji Met Service are currently working and developing a plan to implement the exchange of OPMET data in XML/GML as required by ICAO target for November 2018.

Hong Kong, China	a) Yes, aware of such developments	comments: Developing a solution in-house	b) Yes, during 2016	a) Meteorological Service Provider	a) Yes, and it currently supports Extended AMHS	Nil	h) Depending on whether users require the information to be presented in TAC form and when the mandatory dissemination requirement of OPMET in TAC format as stipulated in Annex 3 is lifted.	Would like ICAO to clarify as follows: 1) Will TAC be allowed (and hence maintained) in long term for presentation of information contained in IWXXM messages to aviation users? 2) What is the regional and global plan for transition from exchanging TAC to IWXXM? 3) Will IWXXM cover all products in Annex 3? What is the roadmap and time table for implementation? 4) What is the roadmap and time table for development to support "data centric" services under the SWIM environment? How will meteorological information be represented in "data centric" services?
India								
Indonesia	a) Yes, aware of such developments	b) planning comments: ANSP already developed a national aeronautical communication network plan. This network is expected to accommodate the digital exchange of OPMET	f) Digital OPMET using XML is already available in the Meteorological Service provider. The AMHS connection to the digital OPMET is being planned.	a) Meteorological Service Provider b) Air Navigation Service Provider (ANSP)	c) Yes, but it does not support Extended AMHS comments; Basic AMHS connection to Singapore is expected to be operational on 2016. Upgrades into extended AMHS is being planned.	Nil	f) Waiting for the ANSP to be able to distribute the digital OPMET information convert from TAC.	The Meteorology Service Provider already deployed TAC converter for the purpose of sending information to WMO. The converter is in Indonesia Agency for Meteorology, Climatology and Geophysics Headquarters. For Deployment the converter to support the digital exchange of meteorological information, need study and budget planning, although Indonesian Agency for Meteorology, Climatology and Geophysics is ready for digital MET information as XML ad GML. The new Aeronautical network has planned to support digital data such as digital exchange of MET info.
Japan	a) Yes, aware of such developments	b) planning	d) Yes, during 2018	d) not yet determined	b) Yes, and it supports Extended AMHS - although this is not configured comments: The AMHS in Japan has a function corresponding to Extended AMHS, that is a file transfer function (File Transfer Body Parts: FTBP). However, it is required new connection between OPMET databank and AMHS, in addition to the improvement of each system for adapting the function of FTBP and responding to the request/reply. It has the issues that the system requirement	Nil	d) Yes, during 2018	In many States, to implement OPMET data exchange in IWXXM, considerable cost will be required to develop infrastructure to utilize IWXXM based information, not only in MET organizations but also in user-guide. Generally, in most States, budgetary requests may need to go through cost-benefit analysis with a clear and detailed explanation on what/by when/who/how to do it. In this context, cost effectiveness for transition from TAC in to IWXXM as well as clear guidance and realistic timeline on how/when to implement the digital OPMET data exchange should be indicated to States in the Region.

					is not defined on the detail to implement.			
Kiribati								
Lao PDR	a) Yes, aware of such developments	b) planning	Nil	a) Meteorological Service Provider	d) No	f) Not sure	e) No	Aviation MET Service Provider such as SIGMET, TAF, METAR/SPECI is provided by Aeronautical MET Service Division and it is belong to department of Meteorology and Hydrology (DMH) under Ministry of Natural Resources and Environment. DMH is response for aviation Meteorology and follow up ICAO Annex 3. The Aeronautical MET Service Provider Unit is under Aeronautical MET Service Division and located at the Air Traffic Management Building (ATM) at Airport. Therefore, propose that all ICAO Meeting related aviation Meteorology should be sent to DMH at the following address: Department of Meteorology and Hydrology Akart Village, Souphanouvong Avenue, Sikhottabong District Lao PDR, P.O. Box 2903 Tel: +865 (21) 215010, Fax: +856 (21) - 212446 E-mail: dmhvte@etllao.com
Macao, China	a) Yes, aware of such developments	b) planning	c) Yes, during 2017	b) Air Navigation Service Provider (ANSP)	d) No	c) Yes, during 2017	d) Yes, during 2018	
Malaysia	a) Yes, aware of such developments	b) planning	c) Yes, during 2017	a) Meteorological Service Provider	c) Yes, but it does not support Extended AMHS	Nil	c) Yes, during 2017	
Maldives	a) Yes, aware of such developments	c) Procuring a solution	b) Yes, during 2016	a) Meteorological Service Provider	d) No	c) Yes, during 2017	b) yes, during 2016	
Marshall Islands								
Micronesia (Federated States of)								

Mongolia	a) Yes, aware of such developments	a) not yet started	d) Yes, during 2018	a) Meteorological Service Provider	d) No	b) yes, during 2016	d) Yes, during 2018	
Mongolia	a) Yes, aware of such developments	b) planning	Nil	a) Meteorological Service Provider comments: Not yet determined	c) Yes, but it does not support Extended AMHS comments: Not sure	d) yes, during 2018	d) Yes, during 2018	Do not have any idea for this digital exchange of OPMET information
Myanmar								
Nauru								
Nepal	a) Yes, aware of such developments	e) Operational	Nil	a) Meteorological Service Provider	b) Yes, and it supports Extended AMHS - although this is not configured	Nil	h) Not yet	
New Zealand	a) Yes, aware of such developments	b) Planning	c) Yes, during 2017	a) Meteorological Service Provider (MetService)	b) Yes, and it supports Extended AMHS - although this is not configured	g) Already implemented	c) Yes, during 2017	
Pakistan	a) Yes, aware of such developments	e) Operational	Nil	a) Meteorological Service Provider	a) Yes, and it currently supports Extended AMHS	Nil	a) Yes, during 2015	
Palau								
Papua New Guinea								
Philippines	a) Yes, aware of such developments	c) Procuring a solution	c) Yes, during 2017	d) not yet determined	d) No	c) Yes, during 2017	e) no	
Republic of Korea	a) Yes, aware of such developments	d) Testing	b) Yes, during 2016	a) Meteorological Service Provider	c) Yes, but it does not support Extended AMHS	f) Not sure	d) Yes, during 2018	
Samoa								
Singapore	a) Yes, aware of such developments	d) Testing	c) Yes, during 2017	a) Meteorological Service Provider c) Regional OPMET Databank (RODB)	a) Yes, and it currently supports Extended AMHS comments: Singapore AMHS supports Extended AMHS on the use of File Transfer Body Parts (FTBP) for binary data exchange as defined in ICAO Doc 9880 and this could support the exchange of IWXXM Binary messages via FTBP.	Nil	c) Yes, during 2017	1) It will be good and useful if ICAO could have an official website supporting IWXXM development and implementation. This website should contain application tools, latest XML model/schemas, IWXXM release announcements and training material etc. 2) It will also be good and useful if ICAO could provide a validation tool to check the data quality of IWXXM messages to ensure consistency in XML/TAC and TAC/XML translations.

Solomon Islands	b) No, we are not aware of such developments comments: The digital exchange model, XML/GML and the AMHS system sounds new to us; requested ICAO to provide Technical support and training for our staff for the implementation of the system	a) not yet started comments: Same remarks as in Q3	e) not sure	d) not yet determined	e) not sure	g) Training and technical expert from ICAO to help us implement the system	h) Yes, if ICAO assist us in training and technical expert to implement the system	As a service provider for Aviation Weather Services, Solomon Islands are most willingly to implement the system but we also needed the trainings and technical supports from ICAO to implement the system. Currently, Solomon Islands is facing problems in disseminations and also in receiving the Meteorological information's. ATS handling information and the distributing system is not working well as expected the function. Solomon Islands Meteorological Services is currently using email system to send messages to Australia Bureau of Meteorology (BOM) in Melbourne, Australia and they distributed our Meteorological products and information after a conversation was made and then distributed via GTS. A copy of the email was sent to ATS and they sent the message by CADAS or AFTN but was very slow.
Sri Lanka								
Thailand	a) Yes, aware of such developments	d) Testing	...	c) Regional OMET Databank (RODB)	b) Yes, and it supports Extended AMHS - although this is not configured	Nil	b) yes, during 2016	
Timor Leste								
Tonga								
USA	a) Yes, aware of such developments	d) Testing	Nil	a) Meteorological Service Provider b) Air Navigation Service Provider (ANSP) c) Regional OOPMET Databank (RODB)	b) Yes, and it supports Extended AMHS - although this is not configured	Nil	c) Yes, during 2017	
Vanuatu								
Viet Nam								
