International Civil Aviation Organization

WORKING PAPER

Asia and Pacific (APAC)
Twenty-second Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/22)

Bangkok, Thailand, 18 to 21 March 2024

Agenda Item 4: Meteorological information exchange in IWXXM form

ENABLING THE RELIABLE AND GLOBAL EXCHANGE OF IWXXM

(Presented by Australia and Hong Kong, China)

SUMMARY

This paper describes the need for increased intra- and inter-regional IWXXM exchange to support the global availability and seeks actions to progress the availability of AMHS networks with FTBP and IHE.

1. INTRODUCTION

1.1 The implementation of the ICAO Meteorological Information Exchange Model (IWXXM) for OPMET exchange became a standard in Amendment 78 to ICAO Annex 3 in November 2020.

1.2 According to the ICAO Guidelines for the Implementation of OPMET Data Exchange using IWXXM (the Guidelines) and the profile of ATS Message Handling System (AMHS) outlined in Appendix A of the Guidelines, the exchange of IWXXM via the Aeronautical Fixed Service requires the extended AMHS with File Transfer Body Part (FTBP) and Interpersonal Message Heading Extension (IHE)) intra- and inter-regionally.

2. DISCUSSION

Recap of past communications on this matter

2.1 The meeting will recall the discussions at Twenty-first meeting of the ICAO APAC Meteorological Information Exchange Working Group (MET/IE WG/21) and Tenth meeting of the Aeronautical Communications Services Implementation Coordination Group of APANPIRG (ACSICG/10) noted that while some States indicated the capability to generate meteorological information in the IWXXM form, they could not disseminate the IWXXM messages from the National OPMET Centre (NOC).

2.2 In some instances, there was no network available for distributing the IWXXM from the NOC to the Regional OPMET Centres (ROCs) and from the ROCs to the Inter-regional OPMET Gateways (IROGs) because the necessary AMHS with FTBP and IHE was not implemented.

2.3 Further, the global exchange is hampered by the lack of exchange from one ICAO region to another region through IROG pairs with AMHS FTBP/IHE capability.

2.4 This lack of suitable networks is a significant obstacle in global provision of IWXXM.

2.5 The lack of global availability of OPMET is currently inhibiting system suppliers and users switching to IWXXM and delaying benefits realisation from the implementation of IWXXM.

2.6 Subsequent discussions at MET SG/27 and CNS SG/27 resulted in a Draft Conclusion being presented to APANPIRG/34 which concluded:

<table>
<tr><td colspan="2">Conclusion APANPIRG/34/13 (Draft Conclusion MET SG/27-03): Global Dissemination of IWXXM</td></tr>
<tr><td>What: Expedite the implementation of network circuits and communication services necessary to enable the required global dissemination of meteorological information in the ICAO Meteorological Information Exchange Model (IWXXM) form, both intra-regionally and inter-regionally between APAC Inter-regional OPMET Gateways (IROGs) and IROGs in the ICAO AFI, MID, NAM and SAM Regions (through inter-regional consultation), including support for the Air Traffic Services Message Handling System (AMHS) with File Transfer Body Part (FTBP) and Interpersonal Message Heading Extension (IHE), and backup paths for redundancy purposes.</td><td>Expected impact:
☐ Political / Global
☒ Inter-regional
☒ Economic
☐ Environmental
☒ Ops/Technical</td></tr>
<tr><td>Why: Following the provisions of ICAO Annex 3 – Meteorological Service for International Air Navigation, States shall ensure that certain meteorological information is disseminated to users in the IWXXM form. However, without suitable communication network connections to support the necessary intra- and inter-regional exchange of IWXXM messages, global dissemination of meteorological information in IWXXM form will not be possible. Consequently, the migration of user and supplier systems from meteorological information in the traditional alphanumeric code (TAC) form to the IWXXM form, as envisaged in the Global Air Navigation Plan (GANP), will remain inhibited.</td><td>Follow-up:
☒Required from States</td></tr>
<tr><td>When: 13-Dec-23</td><td>Status: Adopted by PIRG</td></tr>
<tr><td colspan="2">Who: ☒Sub groups ☒APAC States ☒ICAO APAC RO ☐ICAO HQ ☒Other: PIRGs in other ICAO Regions</td></tr>
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Current Status

2.7 A review of International Messaging Networks – December 2023 AMC Charts for the APAC region shows:

Black – Reported as an AMHS network (IWXXM can be exchanged)
Green – Presently not reported as an AMHS network.

- APAC – AFI VABB - HKNA
  YBBB - FAOR
- APAC – EUR/NAT WSSS - EGGG
  RJJJ - UUUU
  ZBBB - UHHH
  ZMUB - UIII
  VTBB - LIII
- APAC – MID VABB - OOMS
- APAC – NACC YBBB - KSLC
  NZCH - KSLC
  NFFN - KSLC
  RJJJ - KSLC
  RPLL - KSLC
- APAC – SAM No direct routing

2.8 A recent report (Feb 2024) from the European region highlighted the significant difference in the availability of traditional alphanumeric code (TAC) products and IWXXM messages in the EUR Region. This highlights that only about 25% of the global OPMET is available in IWXXM form (934 different IWXXM messages compared to 3762 different TAC messages).

2.9 Successful operation of inter-regional exchange of IWXXM data requires at least 1 capable route to exchange IWXXM data between 2 regions. To provide a highly reliable service, at least 2 routes should be available. The latter allows for the exchange of data during network issues and planned maintenance.

2.10 Multiple network routes are common practice for TAC exchange over the Aeronautical Fixed Telecommunications Network (AFTN), and ongoing work is required to ensure all required routes are AMHS/FTBP compatible. This work has commenced, but significant work remains outstanding. Currently, only APAC-EUR inter-regional IWXXM exchange has backup procedures in place, which was established through the alternate path EGGG – LSSS (Geneve) – LIII (Rome) – VTBB (Bangkok) – WSSS.

2.11 Although inter-regional AMHS circuits are reported available for most of the Region pairs in para. 2.7, inter-regional IWXXM message exchange is not implemented except APAC-EUR, as indicated in Online Register of APAC IWXXM Exchange Status as shown in the Appendix.

2.12 Reasons for not enabling IWXXM exchange over inter-regionally capable circuits may include:

- A lack of capacity on the link to support IWXXM exchange
- One (or more) P3 connections between the IROG and COM Centre not yet capable, even if the inter-regional P1 extended AMHS connection is in place (see figure 1 below)
- Agreement between parties to operationalise the capability outstanding.

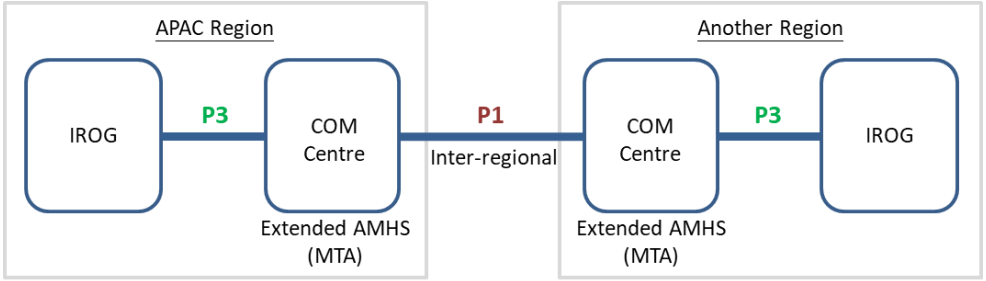

Figure 1: Schematic diagram of inter-regional extended AMHS connections between IROGs

2.13 An additional consideration is that COM Centres worldwide apply standard alternate routing for any primary link failures. If a primary link is AMHS with FTBP capable but its default alternate link is not, standard diversions of traffic do not work. This is not necessarily something that COM Centre personnel are trained in to inspect prior to rerouting traffic

Proposed action by the meeting

2.14 This paper seeks open discussion on actions that can be taken to improve the availability of primary and secondary circuits as well as the necessary communication services to enable efficient and reliable exchange of OPMET information in IWXXM form, both intra-regionally and inter-regionally.

2.15 This paper also invites suggestions on possible ways to promote discussion and coordination with relevant working groups or concerned communication centres in other Regions for the inter-regional IWXXM exchange.

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper;

b) discuss any relevant matter as appropriate; and

c) consider drafting actions or conclusions to support the expediated implementation of primary and where relevant secondary networks to support the exchange of IWXXM.

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APPENDIX – Online register for IWXXM exchange over AMHS in the APAC Region

Online Register of APAC IWXXM Exchange Status

Updated: 31 January 2024

ICAO

ROC		ROC ready to receive IWXXM	ROC address to receive IWXXM	AMHS message size limit	AMHS supporting FTBP+IHE*	Disseminate IWXXM to ROCs	Disseminate IWXXM to NOCs	NOC		IWXXM generated	NOC ready to receive IWXXM	NOC address to receive IWXXM	Remarks
Bangkok	VTBB	YES	/C=XX/A=ICAO/ P=THAILAND/ O=VTBB/ OU1=VTBB/ CN=VTBBYPYL/	4 MB	YES	VHHH, WSSS, YBBB, ZBBB	YES	Bangkok	VTBB	YES	YES	VTBBYMYX	
								Phnom Penh	VDPP	YES	YES	VDPPYMYC	
								Vientiane	VLVT		NO		
								Ha Noi	VVNB	YES	NO		Translation service by VTBB
								Yangon	VYYY		NO		
Beijing	ZBBB	YES	/C=XX/A=ICAO/ P=CHINA/ O=HQ/ OU1=ZBBB/ CN=ZBBBYPYL/	4 MB	YES	RJTD, VHHH, WSSS, YBBB		Beijing	ZBBB	YES			
								Ulaanbaatar	ZMUB	PARTIAL			
Brisbane	YBBN	YES	/C=XX/A=ICAO/ P=AUSTRALIA/ O=YBBN/ OU1=YBBB/ CN=YBBBYPYL/	4 MB	YES	NZKL, RJTD, VHHH, VTBB, WMKK, WSSS, ZBBB	No recipients ready	Brisbane	YBBN	YES			
								Port Moresby	AYPY	YES	NO		Translation service by NZKL
								Nauru	ANYN	YES	NO		Translation service by NZKL
								Honiara	AGGH	YES	NO		Translation service by NZKL
								Dili	WPDL	NO	NO		
Colombo	VCCC	NO						Colombo	VCCC				
								Male	VRMM				
Delhi	VIDP	NO						Delhi	VIDP				
Kolkata	VECC	NO						Kolkata	VECC				
								Dhaka	VGZR				
								Paro	VQPR				
								Kathmandu	VNKT				
Mumbai	VABB	NO						Mumbai	VABB				
Hong Kong	VHHH	YES	/C=XX/A=ICAO/ P=HONGKONG/ O=HKGCAD/ OU1=VHHH/ CN=VHHHYPYL/	4 MB	YES	NZKL, RJTD, VTBB, WMKK, WSSS, YBBB, ZBBB	YES	Hong Kong	VHHH	YES			
								Taibei City	RCTP	YES	YES	RCTPIWXM	
								Manila	RPLL	YES	NO		Translation service by VHHH
								Macao	VMMC	YES	NO		Translation service by VHHH
Incheon	RKSI	NO			Q4 2022			Incheon	RKSI	YES			Available through Open-API
Jakarta	WIII	NO						Jakarta	WIII	YES			
Karachi	OPKC	NO						Karachi	OPKC				
Kuala Lumpur	WMKK	YES	/C=XX/A=ICAO/ P=MALAYSIA/ O=WM/ OU1=WMKK/ CN=WMKKYMXM/	4 MB	YES	WSSS		Kuala Lumpur	WMKK	YES			
								Brunei	WBSB	NO			
Nadi	NFFN	NO				NZKL, VHHH, VTBB, WSSS, YBBB		Nadi	NFFN	YES	NO		Translation service by NZKL TCA in IWXXM available (TCAC Nadi)
								Cook Islands	NCRG	YES	NO		Translation service by NZKL
								Tonga	NFTF	YES	NO		Translation service by NZKL
								Tuvalu	NGFU	YES	NO		Translation service by NZKL
								Kiribati	NGTA	YES	NO		Translation service by NZKL
								Niue	NIUE	YES	NO		Translation service by NZKL
								Samoa	NSFA	YES	NO		Translation service by NZKL
								Vanuatu	NVVV	YES	NO		Translation service by NZKL
								New Caledonia	NWWW	YES	NO		Translation service by NZKL
								French Polynesia	NTAA	YES	NO		Translation service by NZKL
								American Samoa	NSTU	NO	NO		IWXXM by US NWS in the FT/SA/SPUS25 KBWC bulletins
Singapore	WSSS	YES	/C=XX/A=ICAO/ P=SINGAPORE/ O=CAASG/ OU1=WSSS/ CN=WSSSYPYL/	4 MB	YES	NZKL, RJTD, VHHH, VTBB, WMKK, YBBB, ZBBB	---	Singapore	WSSS	YES			
Tokyo	RJTD	YES	/C=XX/A=ICAO/ P=RJ/ O=AFTN/ OU1=RJTDYZYA/	2 MB	YES	NZKL, WSSS, ZBBB		Tokyo	RJTD	YES			TC Advisory in IWXXM available via TCAC Tokyo website
Washington	KWBC	NO	/C=XX/A=ICAO/ P=K/ O=AFTN/ OU1=KWBCYZYZ/	4 MB	YES		No recipients ready	Washington	KWBC	June 2023			New RODB KWBC in Nov 2021. Open API will be available
Wellington	NZKL	YES	/C=XX/A=ICAO/ P=NZ/ O=NZCH/ OU1=NZKL/ CN=NZKLYMYL/	6 MB	YES	VHHH, VTBB, WSSS, YBBB		Wellington	NZKL	YES			

Inter-regional exchange	IROG in APAC		IROG address to receive IWXXM	IROG in another Region		IROG address to receive IWXXM	Active dissemination to another Region	Active reception from another Region	Remarks
APAC - EUR	Singapore	WSSS	/C=XX/A=ICAO/ P=SINGAPORE/ O=CAASG/ OU1=WSSS/ CN=WSSSYPYL/	London	EGGG	/C=XX/ADMD=ICAO/ PRMD=EG/ O=AFTN/ OU1=EGZZXSIN/	YES	YES	Bandwidth between the exchange services was increased to 2Mbps. Backup procedures for the alternate path EGGG – LSSS (Geneve) – LIII (Rome) – VTBB (Bangkok) – WSSS are in place. Secondary backup procedures being explored for alternate path EGGG - KATL (Atlanta) - KSLC (Salt Lake City) - YBBB (Brisbane) - WSSS
APAC - NAM	Tokyo	RJTD	/C=XX/A=ICAO/ P=RJ/ O=AFTN/ OU1=RJTDYZYA/	Washington	KWBC	/C=XX/A=ICAO/ P=K/ O=AFTN/ OU1=KWBCYZYZ/	NO	NO	Test of IWXXM exchange between IROG Tokyo and IROG Washington will be conducted in the near future.
APAC - AFI	Bangkok	VTBB	/C=XX/A=ICAO/ P=THAILAND/ O=VTBB/ OU1=VTBB/ CN=VTBBYPYL/	Pretoria	FAPR	/C=XX/A=ICAO/ P=FA/ O=AFTN/ OU1=FAPRYMYX/	NO	NO	No POC available / known at IROG Pretoria. Extended AMHS with FTBP in place via YBBN - FAOR. FAOR to FAPR (COMC to IROG) was not AMHS capable in 2020, nothing heard since
	Brisbane	YBBB	/C=XX/A=ICAO/ P=AUSTRALIA/ O=YBBN/ OU1=YBBB/ CN=YBBBYPYL/						
APAC - SAM	Brisbane	YBBB	/C=XX/A=ICAO/ P=AUSTRALIA/ O=YBBN/ OU1=YBBB/ CN=YBBBYPYL/	Brasilia	SBBR		NO	NO	No POC available / known at IROG Brasilia. Extended AMHS with FTBP in place via YBBN - KSLC - KATL - SBBR. Unknown what capability from COMC SBBR to IROG SBBR is ...
APAC - MID	Bangkok	VTBB	/C=XX/A=ICAO/ P=THAILAND/ O=VTBB/ OU1=VTBB/ CN=VTZZMMID/	Jeddah	OEJD	/C=XX/A=ICAO/ P=SAUDI/ O=OEJD/ OU1=OEJD/ CN=OEJDYMYX/	NO	NO	Test of IWXXM exchange conducted since May 2022 but not successful due to COMC OOMS still AFTN, so Bangkok is awaiting COMC COMS migrate to Extended AMHS with FTBP connection.

* AMHS profile for IWXXM exchange is specified in the Appendix A of "Guidelines for the Implementation of OPMET Data Exchange using IWXXM"

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