International Civil Aviation Organization

WORKING PAPER (WP/10)

ICAO Asia and Pacific (APAC)
Twenty-third Meeting of the Meteorological Information Exchange Working Group (MET/IE WG/23)

Bangkok, Thailand, 25 to 28 March 2025

Agenda Item 6.1: Readiness of AMHS to support IWXXM

COM CENTRE EDUCATIONAL MATERIAL REGARDING IWXXM DISTRIBUTION IN THE EVENT OF PRIMARY LINK FAILURE

(Presented by Australia, Fiji, Hong Kong, Singapore, and United States of America)

SUMMARY

This paper provides educational material for COM Centre operators to understand that distribution of IWXXM information require links possess specific capabilities, and in the event of a primary link failure any alternate/secondary links must also possess the same or similar specific capabilities.

1. INTRODUCTION

1.1 The previous Meeting (MET/IE WG/22) noted that the standard alternate routing applied for primary link failures in communication centres worldwide will only work for IWXXM messages if the alternate/secondary link is AMHS with FTBP capable.

1.2 The previous Meeting agreed that a group of operational communications experts (comprising members from AUS, FJI, HKG, SGP and USA) will develop educational material to manage the distribution of IWXXM information when primary AMHS link failure occurs. **[ACTION MET/IE WG/22-14] [ACTION ACSICG/11 11-2]**

2. DISCUSSION

2.1 IWXXM information being the successor OPMET format to TAC, can only be transported over links which possess specific capabilities.

2.2 AFTN links do not possess the link capabilities required nor expected to transport IWXXM information.

2.3 COM Centres have little control beyond their own links, and this is evident in the case of cascading or multiple failures throughout the ATN.

2.4 We present educational material which identifies the required link capabilities to maintain IWXXM message distribution in the event of a primary link failure, provide important contextual background for the required secondary/alternate link capabilities, and propose actions aligned with the link requirements to maintain the message distribution.

2.5 The educational material for COM Centre operators is attached below

Distribution of IWXXM when primary AMHS link fails (Appendix A)	IWXXM distribution during primary link

3. ACTION BY THE MEETING

3.1 The meeting is invited to:

a) note the information contained in this paper; and

b) discuss any relevant matter as appropriate.

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Distribution of IWXXM when primary AMHS link fails

1 Purpose

This document provides educational material about a capability-based approach to thinking about *ICAO Meteorological Information Exchange Model* (IWXXM) message distribution for Asia Pacific (APAC) Com Centre (COMM) operators in the event of a primary link failure.

2 Assumptions

Link and connection enablement and establishment are pre-requisites to this educational material.

IWXXM message is assumed to be fully correct and compliant.

IWXXM message structure and content details are not required knowledge.

IWXXM/TAC Translation services are out of scope, due to data loss resulting from message conversion.

Originator capabilities for IWXXM handling are assumed to be fully compliant.

Recipient capabilities for IWXXM handling are assumed to be fully compliant.

COMMs are expected to ensure and provide assurance that data loss and data corruption do not occur when transiting their own COMM and network.

Full end-to-end delivery enablement for IWXXM is the objective, but not within scope of this document.

3 IWXXM Message Transfer Considerations

3.1 Message Addressing and Routing

APAC States are using address-based routing for IWXXM messages.

APAC States are not using content-based routing nor pathname-based routing for IWXXM messages.

Address-based routing provides some flexibility to the COMM operator to optionally divert IWXXM messages down a specific alternate link, while all other AMHS traffic can be diverted via a separate alternate link.

Address-based routing simplifies COMM operator assessments of alternate connections, since this shifts more decision-making to a coarser link-level decision instead of fine-grained content-based or pathname-based decisions.

3.2 Link Capabilities

AFTN links for IWXXM should not be used, because:

- IWXXM message sizes can far exceed AFTN message sizes
- IWXXM character sets are generally incompatible with AFTN connection character sets
- Down-converting IWXXM messages for transmission via AFTN has high risk of **data loss** and/or **data corruption**

Care should be taken to also consider any internal COMM links which may also prevent unmodified IWXXM message traversal.

AMHS links should meet the following minimum requirements:

- Message size supported up to maximum 4MB
- FTBP supported
- IHE supported
- Link speeds higher than 64kbps is recommended, required bandwidth is dependent upon connection use

Information about AMHS connection capabilities is stored at the AMC.

The AMC can store information about AMHS connection capability (linked via “Network Inventory”, then in the “AMHS Capabilities” tab), allowing for future retrieval.

However, there may be limitations with AMC data accuracy and freshness.

Outside of the AMC, connection capabilities prior to commissioning by the COMM should already be known, recorded, and kept fresh.

3.3 Message Structure and Content

When compared to TAC products, IWXXM messages have complex message structures and complex content requirements.

However, so long as the AMHS connection capabilities are satisfied, IWXXM message transfer can occur.

MTS supporting IWXXM transfer do not need to be able to parse IWXXM message contents.

4 Actions

In the event of a primary link failure, the COMM operator will now have sufficient background knowledge to be able to assess whether an alternate link is acceptable for transferring IWXXM messages.

In all circumstances,

- AFTN links are excluded from consideration
- Alternate links should have similar or better connection capabilities to the failed primary link

The following four major actions can be used:

- Link-based diversion
- Address-based diversion
- Content-based diversion / pathname-based diversion
- Traffic hold

4.1 Link-based Diversion

This is simply diverting all traffic via an alternate same-type link.

This is a common diversion tactic currently accomplished via the RQP mechanism.

4.2 Address-based Diversion

APAC IWXXM messages currently utilise address-based routing, for which specific address-based diversions can be activated.

Recipient addresses within APAC are listed in the Online Register of APAC IWXXM Exchange Status (Link: https://docs.google.com/spreadsheets/d/1WEcGfMRZq2dgHsfdpFhiefJEcA8OeMhfbCJHTqA7NX0/edit#gid=0).

This means that IWXXM messages can be routed via a suitable alternate AMHS link, whilst all other traffic is routed via a different alternate AMHS link.

This may be useful to load-balance traffic between different alternate AMHS links.

4.3 Content-based Diversion / Pathname-based Diversion

Content-based and pathname-based diversions follow similarly to address-based diversions, but may require additional functionality.

4.4 Traffic Hold

Given the importance of meteorological information, data loss should be avoided as much as reasonably possible.

Where no alternate exists, then a traffic hold may be considered.