

International Civil Aviation Organization



ICAO

**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

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**Agenda Item 5: Meteorological information exchange in SWIM**

**KEY ACTIVITIES BEING PROGRESSED BY METP WG-MIE**

(Presented by Australia)

**SUMMARY**

This paper provides a summary of key activities being undertaken by ICAO METP WG-MIE of relevance to MET-IE WG.

**1. INTRODUCTION**

1.1 The ICAO Air Navigation Commission (ANC) assigned Job Card METP.004, *Inclusion of aeronautical meteorological information in the SWIM-enabled environment and further development of the SWIM concept relating to meteorology*, to the ICAO Meteorological Panel (METP).

1.2 The ICAO METP tasked its Working Group on MET Information Exchange (WG-MIE) to carry out the goals set forth in Job Card METP.004 (refer to Appendix A).

1.3 The objective of the WG-MIE is to ensure the smooth transition to the provision of MET information in the ICAO Meteorological Information Exchange (IWXXM) format and into the System Wide Information Management (SWIM) environment. A major focus is to progress planning for the transition from traditional alphanumeric code (TAC) to IWXXM formats and progress the development of the architecture and policies associated with meteorological aspects of SWIM (MET-SWIM).

1.4 This paper provides an update on some of key activities of WG-MIE of relevance to the work of MET/IE WG.

**2. DISCUSSION**

Amendments to ICAO Annex 3

2.1 The ANC has deferred the approval of the report and outcomes of the Fifth Meeting of the METP (METP/5) including proposed Amendment 81 to ICAO Annex 3, which has led to changes in amendments to ICAO Annex 3, timing of Sixth Meeting of METP/6 and associated activities of the

WG-MIE. This has resulted in changes to amendment numbers, with the "likely" contents and timings as follows:

Updated Annex 3 Amendment Schedule			
Origin	Amendment No.	Original Expected Applicability	NEW Expected Applicability
IMP/2 – Enabling Information Services	Amendment 81	November 2024	<b>November 2024</b>
METP/5	Amendment 82	November 2024	<b>November 2025</b>
METP/6	Amendment 83	November 2026	<b>November 2027</b>
METP/7	Amendment 84	November 2029	<b>November 2030</b>

2.2 It is proposed that the global exchange of most text formatted meteorological products will be removed as an Annex 3 standard in 2030.

#### Enabling MET-SWIM Information Services

2.3 Whilst ICAO has determined that information services will be enabled through Amendment 81 to ICAO Annex 3 with applicability from Nov 2024, the first ICAO meteorological SWIM (MET-SWIM) services to be introduced to Annex 3 in 2027 are likely to be:

- aerodrome observation information service
- aerodrome forecast information service
- quantitative volcanic ash (QVA) concentration information service

2.4 Hazardous Weather Information Service (HWIS), which aims to provide phenomena based, globally consistent, en-route hazardous weather information to the customers, may also be introduced in 2027 and is being progressed by METP Working Group on Meteorological Requirements and Development (WG-MRAD) of ICAO METP. HWIS will provide access to timely, high temporal and spatial frequency weather hazard information. This will include impact-based alerting services that will provide customers with tailored notifications of meteorological conditions that meet criteria that is operationally significant to their business. HWIS is expected to initially include thunderstorm, icing and turbulence phenomena.

2.5 MET-SWIM will support access to:

- Objects/features in IWXXM format via both request/reply and publish/subscribe messaging patterns
- Gridded data via the Open Geospatial Consortium Environmental Data Retrieval (OGC-EDR) Application Programming Interface

2.6 There is some discussion about introducing a SWIM streaming service to support rapid update information (e.g. one-second and one-minute observations) but any decisions were deferred until a clearer requirement is developed.

#### Information Service Definition and Information Service Overview

2.7 The ICAO Information Management Panel (IMP) is responsible for leading the development of SWIM.

2.8 IMP is developing the requirements for the Information Service Definition as part of their JobCard. An information service definition will be produced for each Annex 3 information service. An information service definition is not to be confused with an information service overview. An information service definition is produced by a community (METP). It places requirements on service providers. This results in a harmonised service implementation to the benefit of the service consumer.

2.9 An information service overview is produced by a service provider (State). It describes the running service using metadata fields specified in the Procedures for Air Navigation Services (PANS) – Information Management (PANS-IM) and helps the service consumer in deciding when and how to use the service. An information service overview may reference the information service definition to which it adheres. Information service definitions for intended information services in the MET domain should be included in the PANS-Meteorology (PANS-MET).

2.10 Draft versions of Europe's initial MET-SWIM service definitions are available: [https://ext.eurocontrol.int/swim\\_confluence/display/MSS/Meteorological+SWIM+Services](https://ext.eurocontrol.int/swim_confluence/display/MSS/Meteorological+SWIM+Services)

#### MET-SWIM Documentation

2.11 WG-MIE is currently developing a draft version 3.0 of the MET-SWIM Roadmap, including revised transition capabilities and implementation schedules.

2.12 WG-MIE has decided that the *Plan for Meteorology in SWIM* (MET-SWIM Plan) should be deprecated, and the contents of the current version (Version 2.3) should be brought into a new *Guidelines for MET-SWIM Implementation* document. This Guidelines for MET-SWIM Implementation document will also contain:

- Advantages and disadvantages for the use of ‘messaging’ versus ‘web service’ and occasions when ‘messaging’ can be combined with ‘web service.’
- Use of the Advanced Message Queuing Protocol (AMQP)
- Use cases for accessing objects, gridded data, and images
- Use of the OGC EDR API.

#### Transition from OPMET exchange to MET-SWIM

2.13 WG-MIE has also been looking at how we transition from traditional OPMET exchange over the Aeronautical Fixed Services (AFS) to the future SWIM services and agreed that:

- Many existing OPMET exchange functions, such as ROCs, RODBs and IROGs, won't exist in a SWIM environment. Instead these services will be offered by some SWIM information service providers and won't likely be roles allocated by ICAO to States.
- The retirement of IWXXM collective bulletins over the AFS is currently not practical at a global scale.

2.14 The term “OPMET” will not have any definite relevance in MET-SWIM, so over the coming years, where possible, the term should be removed from all existing documents.

#### Notification of changes to IWXXM

2.15 WG-MIE and WMO Task Team on Aviation Data (TT-AvData) are working together to establish a formal communications process, aligned with AIRAC cycles, for future versions and releases of IWXXM to ensure that there is improved awareness of new IWXXM releases.

2.16 The notifications procedures will need support notification of changes to core IWXXM and State extensions. It was noted that systems may also need to change when States implement changes to their extensions to the core IWXXM schema.

2.17 The group agreed to the following policies regarding new versions of IWXXM which will be incorporated into a future version of the IWXXM Guidelines document:

- New versions of IWXXM shall only be implemented in Aeronautical Information Regulation and Control (AIRAC) dates.
- New versions of IWXXM should only be implemented on the 6th or 12th (preferred) AIRAC cycle of the year. Where more timely updates are required, the 3rd or 9th AIRAC cycles could be considered.
- A minimum of 12 months lead time\*\* should be provided for major changes of non-time critical/safety nature.
- A minimum of 6 months lead time\*\* should be provided for minor changes of non-time critical/safety nature.

\*\* Note: From the publishing of the revised IWXXM schema.

2.18 WMO have been requested to setup a subscription service to notify users (ANSPs, MSPs, airlines) of changes to IWXXM.

2.19 The group discussed how much notice is provided once a schema is published, and clarified the current process wherein WMO begins development work on schema as soon as METP endorses an Annex 3 amendment proposal. WMO aims to publish schema at the same time the Annex 3 Amendment becomes applicable. Additionally, the policies would be applied to all users of the *Guidelines for the Implementation of IWXXM Exchange* (IWXXM Guidelines), noting that nothing can be mandated through guidance documents.

#### Updates to the IWXXM Guidelines

2.20 Version 5 of the *Guidelines for the Implementation of IWXXM Exchange* (IWXXM Guidelines) has been finalized and is ready for the ICAO Secretariat to publish and distribute amongst the ICAO Planning and Implementation Regional Groups (PIRGs).

2.21 The following items are being considered for inclusion in Version 6 of the IWXXM Guidelines:

- Guidance on how Regional OPMET Data Banks (RODBs) should provide MET information when available in different IWXXM versions
- Service level of IWXXM schema website (schemas.wmo.int)
- Guidance on the direction of polygons in IWXXM
- Policy on the deprecation of IWXXM elements
- Procedures for use of global extension repository
- Guidance for States who wish to issue single location reports
- Procedures for notification of changes to core IWXXM and extensions
- Documentation on the change management process for IWXXM development.

#### Other General Outcomes

2.22 The establishment of a formal change control board (CCB) for IWXXM is not necessary given the existing collaboration between WG-MIE and WMO TT-AvData.

2.23 WG-MIE is seeking input from the new ICAO Trust Framework Panel (TFP) with regards to use of the public internet for MET-SWIM services.

2.24 There is a need for ICAO to host a repository of IWXXM schema extensions.

2.25 The lack of globally accessible IWXXM is preventing users from migrating to IWXXM. Increased focus needs to be given to States to assist and promote the implement of IWXXM, including intra- and redundant inter- regional AMHS circuits.

### **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 aspects or follow-up actions for MET-IE WG.

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**APPENDIX [A] - Current Job Card METP.004**

<b>METP.004.04</b>	<b>Inclusion of aeronautical meteorological information in the SWIM-enabled environment and further development of the SWIM concept relating to meteorology</b>
<b>Source</b>	MET Divisional Meeting 2014 (Recommendations 2/2, 3/2 and 3/3)
<b>Problem Statement</b>	Aeronautical meteorological information needs to be integrated into the SWIM-enabled environment which introduces unique issues relating to governance and data management.
<b>Specific Details</b>	It was recommended by the Meteorology Divisional Meeting (MET/14, Doc 10045) in Recommendations 2/2, 3/2 and 3/3, that an appropriate ICAO expert group, in close coordination with World Meteorological Organization (WMO), develop provisions to enable the inclusion of aeronautical information in the future system-wide information management (SWIM) environment consistent with the Global Air Navigation Plan (Doc 9750). Further principles were also identified to guide the development of the SWIM concept relating to meteorology as provided in Appendix B of Agenda Item 3 of the MET/14. The transition from the Internet-based SADIS/WIFS system is an integral part of these considerations as are the intermediate steps towards full SWIM by making the Annex 3 products compliant with the ICAO Meteorological Information Exchange Model (IWXXM). This will involve the resolution of institutional issues that solely relate to the management and use of aeronautical meteorological information and the necessary links between information supporting other domains in the aviation field and in meteorology supported by the WMO. Further development should take into consideration the main legacy tasks from the Meteorological Aeronautical Requirements and Information Exchange Project Team (MARIE-PT), Satellite Distribution System for Information Relating to Air Navigation Operations Group (SADISOPSG) and the World Area Forecast System Operations Group (WAFSOPSG) that relate to information exchange. Enable the exchange of new meteorological information services in line with the GANP requirements.
<b>GANP/GASP Link</b>	
<b>Expected Benefits</b>	The full integration of aeronautical meteorological information into the SWIM environment will enable the full benefits to be derived relating to safety and efficiency.
<b>Reference Documents</b>	ICAO Annex 3 - Meteorological Service for International Air Navigation ICAO Doc 8896 - Manual of Aeronautical Meteorological Practice ICAO Doc 9750 - Global Air Navigation Plan ICAO Doc 10003 - Manual on the ICAO Meteorological Information Exchange Model ICAO Doc 10039 - Manual on System Wide Information Management (SWIM) Concept ICAO Doc 10045 - Report of the Meteorology Divisional Meeting 2014 WMO-No. 306 – Manual on Codes
<b>Primary Expert Group:</b>	Meteorology Panel (METP)

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For Information purposes (to be completed by the Secretariat)								
Proposed Metric								
Interdependencies								
Initial Impact Assessment	Impact on States							
	Impact on Industry							
Secretariat Project Team	Secretariat Project Coordinator							
	Secretariat Project Team Members							
	Regional Office Focal Points							
	WPE No.	Document Affected or Actions Needed	Description of Amendment proposal or Action	Supporting Expert Group	Status	Expected dates:		
						Delivery	Effective	Applicability
✓	10074	Actions	Update the document "Guidelines for the Implementation of OPMET data exchange using IWXXM"	CP	Completed	Q2 2019	Nov 2019	Nov 2019
✓	10076	Actions	Develop a plan for the implementation of MET information into a SWIM environment (MET-SWIM Plan)	IMP	Completed	Q2 2019	Nov 2019	Nov 2019
✓	10079	Actions	Develop a draft roadmap for the implementation of MET information into a SWIM environment (MET-SWIM Roadmap)	IMP	Completed	Q2 2019	Nov 2019	Nov 2019
✓	10077	Actions	Update the document "Guidelines for the Implementation of OPMET data exchange using IWXXM"	CP	Completed	Q2 2020	Nov 2020	Nov 2020
✓	1705	Annex 3	Standards for IWXXM compliant METAR, SPECI, TAF, SIGMET, AIRMET, VAA, TCA and SWXA exchange		Completed	Q3 2018	Nov 2020	Nov 2020

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✓	10082	Manual of Aeronautical Meteorological Practice (Doc 8896)	Update related guidance material to support the implementation of Annex 3 Amendments		Completed	Q2 2020	Nov 2020	Nov 2020
✓	10084	Manual on the ICAO Meteorological Information Exchange Model (Doc 10003)	Update related guidance material to support the implementation of Annex 3 Amendments		Completed	Q2 2020	Nov 2020	Nov 2020
✓	10078	Actions	Update the plan for the implementation of MET information into a SWIM environment (MET-SWIM Plan)	IMP WMO	Completed	Q2 2021	Jul 2021	Jul 2021
✓	10080	Actions	Update the roadmap for the implementation of MET information into a SWIM environment (MET-SWIM Roadmap)	IMP WMO	Re-scheduled	Q2 2021	Jul 2021	Jul 2021
✓	10448	Annex 3	Standards for IWXXM compliant SIGWX exchange	WMO	Completed	Q3 2018	Jul 2020	Nov 2021
✓	10075	Actions	Ensure that Doc 10039 supports MET in SWIM	IMP	Re-scheduled	Q4 2022	Nov 2024	Nov 2024
✓	10450	Actions	Update the document "Guidelines for the Implementation of OPMET data exchange using IWXXM"	CP WMO	On-schedule	Q2 2023	Nov 2024	Nov 2024
✓	10451	Actions	Update the plan for the implementation of MET information into a SWIM environment (MET-SWIM Plan)	IMP WMO	On-schedule	Q2 2023	Nov 2024	Nov 2024
✓	10452	Actions	Update the roadmap for the implementation of MET information into a SWIM environment (MET-SWIM Roadmap)	IMP WMO	On-schedule	Q2 2023	Nov 2024	Nov 2024
✓	10449	Annex 3	Standards for meteorological information exchange, including quantitative volcanic ash	WMO	Delivered	Q2 2021	Jul 2024	Nov 2024
✓	10081	PANS-MET (Doc 10157)	Technical specifications for meteorological information exchange	WMO	Delivered	Q2 2021	Jul 2024	Nov 2024



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✓	10083	Manual of Aeronautical Meteorological Practice (Doc 8896)	Update related guidance material to support the implementation of Annex 3 Amendments	WMO	Re-scheduled	Q2 2022	Nov 2024	Nov 2024
✓	10085	Manual on the ICAO Meteorological Information Exchange Model (Doc 10003)	Update related guidance material to support the implementation of Annex 3 Amendments	WMO	Delivered	Q2 2022	Nov 2024	Nov 2024
✓	10073	Annex 3	Amendment to facilitate the introduction of the meteorological component of SWIM	IMP WMO	Delivered	Q2 2021	Jul 2024	Nov 2026
✓	10453	Annex 3	Amendment for the introduction of the meteorological component of SWIM	IMP WMO	On-schedule	Q4 2024	Jul 2026	Nov 2026
✓	10072	PANS-MET (Doc 10157)	Amendment to facilitate the introduction of the meteorological component of SWIM	CP IMP WMO	Delivered	Q2 2021	Jul 2024	Nov 2026
✓	10454	PANS-MET (Doc 10157)	Amendment for the introduction of the meteorological component of SWIM	CP IMP WMO	On-schedule	Q4 2024	Jul 2026	Nov 2026
✓	10455	Manual of Aeronautical Meteorological Practice (Doc 8896)	Update related guidance material to support the implementation of Annex 3 Amendment 82	WMO	On-schedule	Q2 2026	-	Nov 2026
✓	10456	Manual on the ICAO Meteorological Information Exchange Model (Doc 10003)	Update related guidance material to support the implementation of Annex 3 Amendments 82	WMO	On-schedule	Q2 2026	-	Nov 2026
<b>For Information purposes (to be completed by the Secretariat)</b>								
<b>GLOBAL IMPLEMENTATION ACTIONS</b>								

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Status:	Priority:	Initial Issue Date:	Date Approved by ANC:	Session / Meeting:
Approved	Medium	17 June 2015	24 November 2022	221-5
RATIONALE				
<ul style="list-style-type: none"><li>- AN-Min 221-5</li><li>- Minor update to Priority: Approved by ANC on 4 Nov 2021 based on AN-WP/9538 DP2 (AN-Min 218-7)</li><li>- AN-WP/9304</li></ul>				