



Modernization of Aeronautical MET Services

**INTERNATIONAL
CIVIL AVIATION
ORGANIZATION**



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Presentation Overview

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1. Evolution of MET services

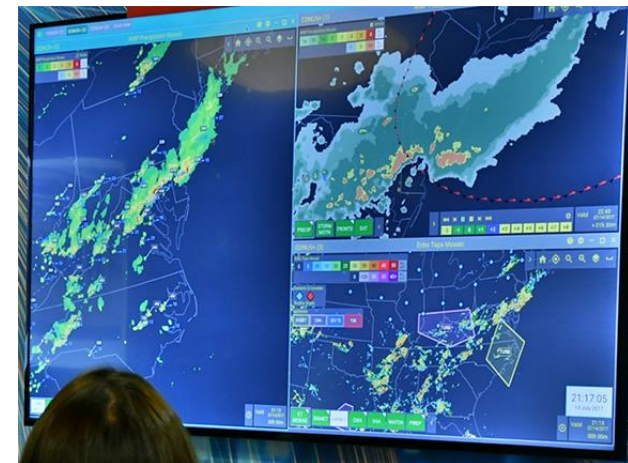
From static products to dynamic services

Traditional approach	Future approach
Static, text-based products (e.g., METAR, TAF)	Dynamic, machine-readable data (e.g. IWXXM)
Point to point circuits for distributing products	Mesh networks allowing access from anywhere
Limited integration with automated systems	Seamless integration with ATM and airline systems and decision aids

Teletype Machines



Aviation Weather Display



2. ICAO Global Air Navigation Plan (GANP, Doc 9750)

- The GANP is an important planning tool for setting global priorities to drive the evolution of the global air navigation system
- Ensure that the vision of an integrated, harmonized, globally interoperable and seamless system becomes a reality.
- Multi-layer structure of air navigation plans, from global (GANP), regional (RANP) to national (NANP) levels.



MULTILAYER STRUCTURE OF THE GANP

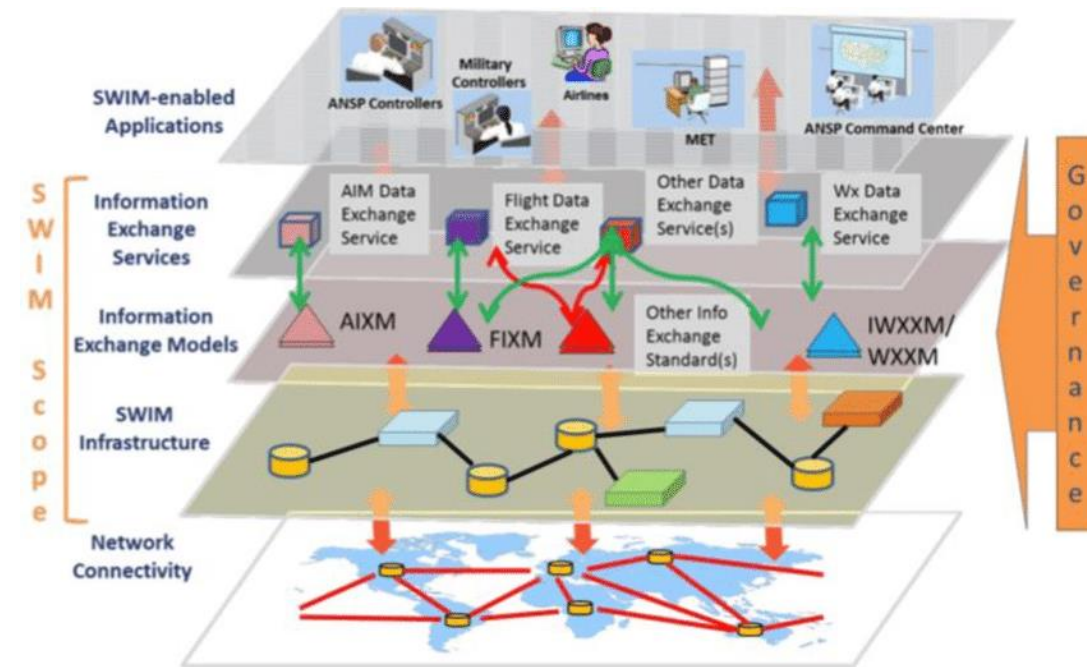
Click a level to navigate



URL: <https://www4.icao.int/ganportal/>

SWIM – The digital backbone of Future MET Services Provision

- System Wide Information Management (SWIM) is the foundation of a global, interoperable, and data-centric aviation ecosystem.
- Key requirements for MET:
 - Met data in IWXXM format
 - Delivery via web services
 - Supports automation and decision aiding systems
 - Ensures global and cross-domain interoperability



SWIM Global Interoperability Framework
ICAO Manual on SWIM (Doc 10039)

MET-SWIM

- ICAO GANP defines information service provision and consumption should commence within Aviation System Block Upgrade (ASBU) 2 (2025-2030)
- Roadmap for Meteorology in System Wide Information Management (MET-SWIM Roadmap) describes the transition plan and associated timelines for implementing MET-SWIM, including TAC cessation in 2030
- MET-SWIM Roadmap describes change across ASBUs 1-4, including
 - communication protocols
 - information exchange services
 - data types
 - data addressing

ASBU Element	ASBU Element Description	ASBU	Timeline
AMET-B1/4	Dissemination of MET Information	1	2019 – 2024
AMET-B2/4	MET Information Service in SWIM	2	2025 – 2030
AMET-B3/4	MET Information Service in SWIM	3	2031 – 2036
AMET-B4/4	MET Information Service in SWIM	4	2037 – 2042

Source: MET-SWIM Roadmap, Table 1



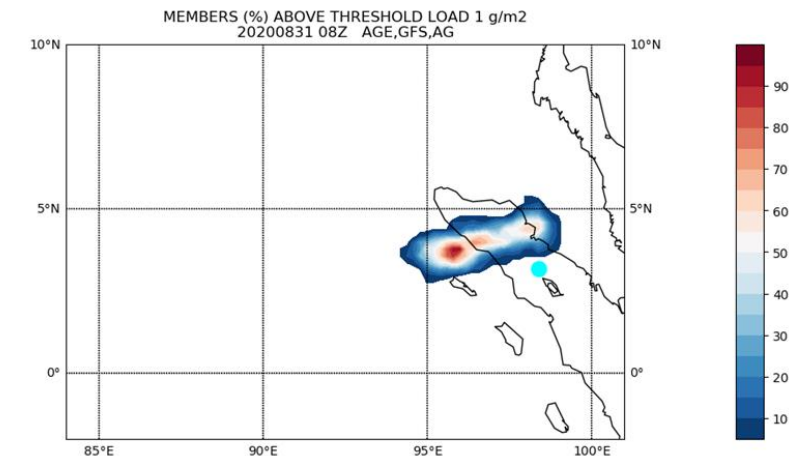
Expected Initial MET-SWIM Services

SADIS & WIFS API: Enhancing Aviation Data Services

- **Operational in 2024:**
 - **SADIS** (WAFAC London) & **WIFS API** (WAFAC Washington) provide access to key aviation data
 - Both are SWIM-compliant, based on the OGC Environmental Data Retrieval (EDR) API framework
- **Key Data Provided:**
 - Upgraded WAFS gridded data, METARs, TAFs, SIGMETs, WAFS SIGWX forecasts

Quantitative Volcanic Ash Concentration Information (QVA)

- Introduced in Amendment 82 to Annex 3 (effective 27 Nov 2025)



Expected Initial MET-SWIM Services (Cont.)

AMOIS (Aerodrome Meteorological Observational Information Service)

- Provides aerodrome observations with higher fidelity than METAR, SPECI, etc., in terms of representation, spatial/temporal accuracy, and coverage

AMFIS (Aerodrome Meteorological Forecast Information Service)

- Delivers aerodrome forecasts beyond the specifications of TAF, TREND, and other current aerodrome forecasts

HWIS (Hazardous Weather Information Service)

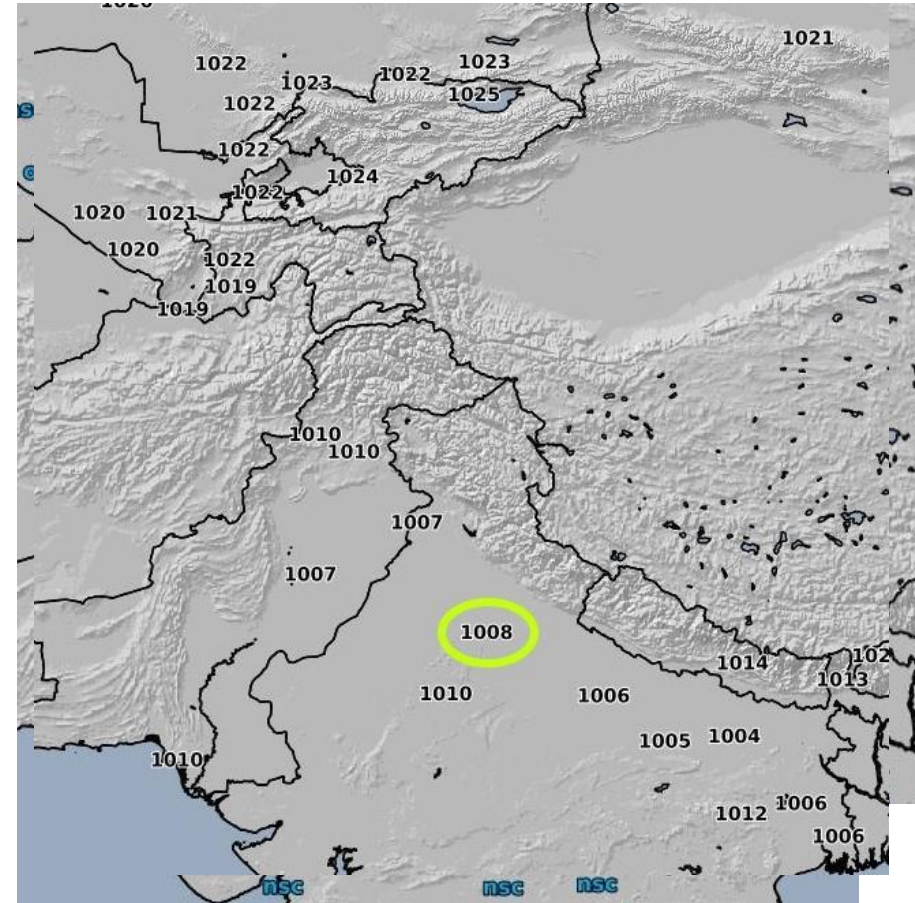
- Provides standardized, harmonized, and high-resolution information on hazardous weather—such as CB, icing, and turbulence—in gridded and object form. It is expected to replace SIGMETs.

Implementation

- Expected introduction as Recommended Practices in **Amendment 84** to Annex 3 and **Amendment 2** to PANS-MET, with applicability in **November 2030**

AMOIS (Aerodrome Meteorological Observational Information Service)

STATION- ID	OBSERVATION TIME	METAR
VIDP	23.04.25, 01:30	SAIN32 VIDP 230130 METAR VIDP 230130Z VRB02KT 3000 HZ NSC 24/03 Q1008 NOSIG=



AMFIS (Aerodrome Meteorological Forecast Information Service)

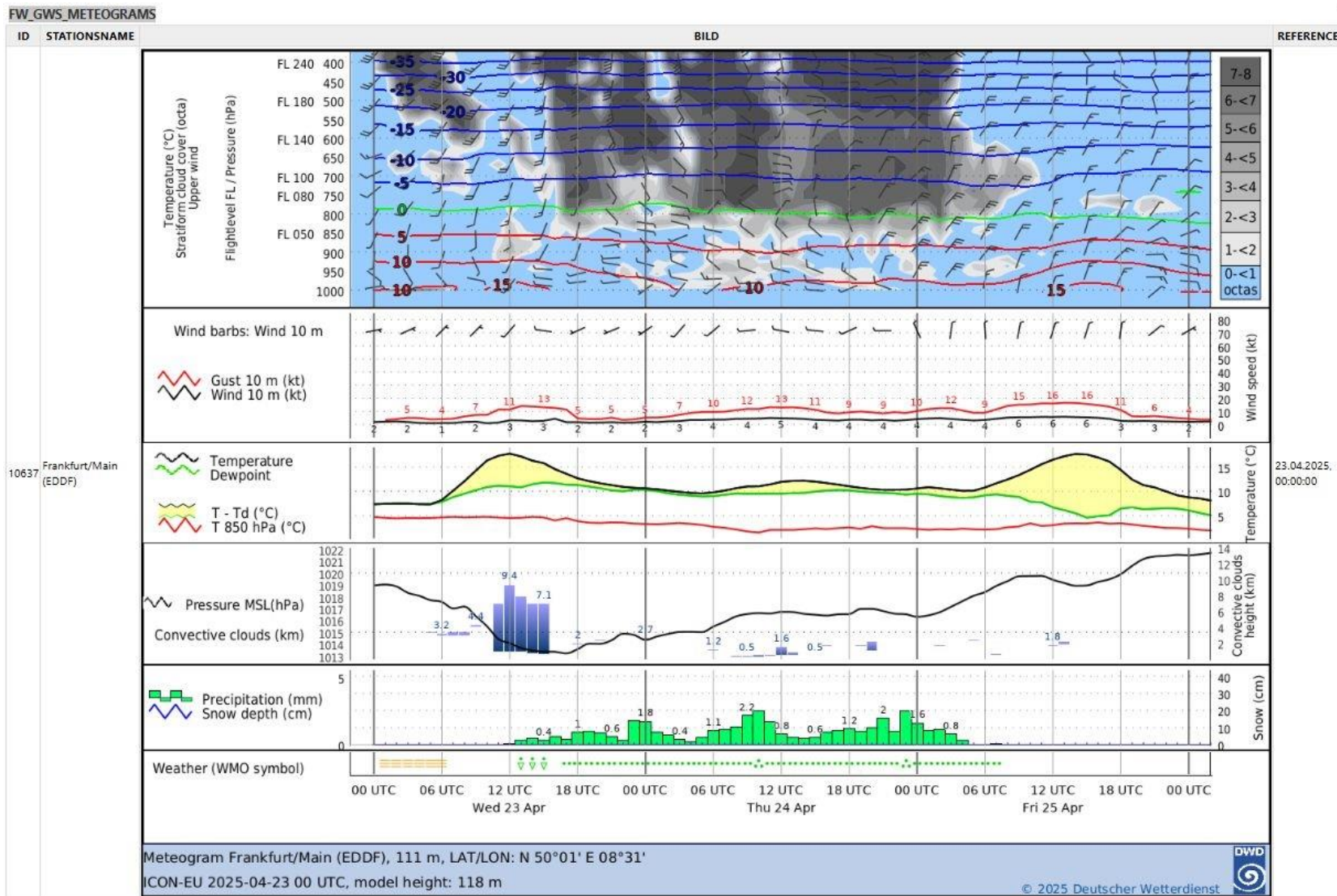
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05004KT CAVOK

BECMG 2309/2312 25005KT

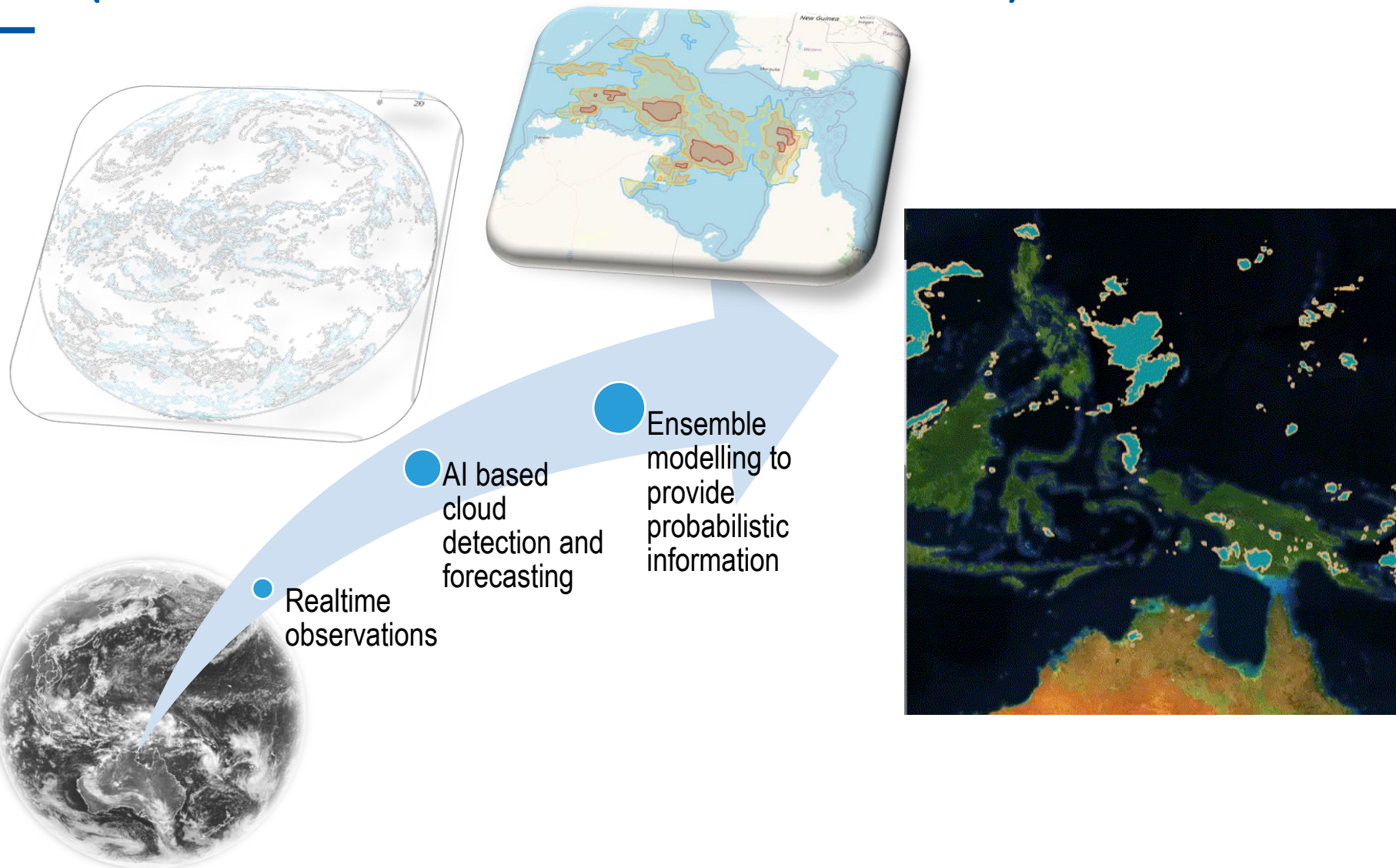
TEMPO 2311/2318 SHRA BKN030CB
PROB30 TEMPO 2313/2317 3000
TSRA

BECMG 2318/2320 FEW012 BKN030

PROB40 TEMPO 2318/2408 RA
PROB30 TEMPO 2405/2410 BKN012=



HWIS (Hazardous Weather Information Service)



4. Key Takeaways

- ICAO has endorsed the shift to data-centric MET services
- ICAO is consulting States on the removal of the requirement to exchange OPMET in TAC form from 2030
- Generating IWXXM is the first step (preferably from source)
- Transitioning from METAR, TAF, SIGMETs to digital, automated services (quality data is essential)
- AMOIS, AMFIS, HWIS define the next generation aviation weather data
- Final requirements and timelines are still under review by the ICAO MET Panel
- Start thinking and preparing for future MET information services



5. Key Documents

- Global Air Navigation Plan <https://www4.icao.int/ganportal/>
 - ICAO Annex 3 <https://elibrary.icao.int/product/264207>
 - ICAO PANS-MET (Doc 10157) <https://store.icao.int/en/procedures-for-air-navigation-services-meteorology-pans-met-doc-10157>
 - MET-SWIM Roadmap
 - MET-SWIM Implementation Guidelines
 - IWXXM Guidelines for OPMET Exchange
- <https://www.icao.int/APAC/apac-electronic-documents>

Thank You

