

# IWXXM Status & Operational Implementation

Presented to: ATIEC 2019

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# Agenda

- **IWXXM Overview**
- **IWXXM Implementation Status**
- **IWXXM Issues**
- **IWXXM Support to SWIM & Operations**



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# IWXXM Status

- **IWXXM Version 2.1 released May, 2018**
- **IWXXM Version 3.0 release candidate made available April, 2019.**
  - **Final version implementation autumn/winter 2019**
    - **Supporting November, 2020 SARP effective date**
- **Refining version update processes**
  - **Align with AIXM and FIXM**
  - **Issues with WMO change management**



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# IWXXM Status

- **ICAO Annex 3**
  - November 2016, Amendment 77
    - ✦ Allows the exchange of IWXXM products as *'recommended'* practice
  - November 2020 Amendment 79
    - ✦ Will make the [International] exchange of IWXXM products a *'mandatory'* practice



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# IWXXM Status

- Products include:
  - TAF
  - METAR & SPECI
  - SIGMET
  - AIRMET
  - Volcanic Ash Advisory
  - Tropical Cyclone Advisory
  - \*Space Wx
    - » TBD 2020/2021
  - SIGWX
    - » “Test” status by 2021, Operational 2022
  - Future – Data Centric rather than Product Centric



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# Why IWXXM

- **Essentially makes information “digital”**
  - Supports multiple uses, applications, and integration
    - Unlike BUFR or GRIB; follows International Standards
- **TAC supports human reading only**
- **IWXXM supports multiple formats & uses**
  - Digital (machine to machine)
    - Flight planning systems
    - Integration with AWIPS, NWP, NDFD, etc.
    - Graphical output
    - SIGWX, CCFP
  - Mapping integration
    - Google maps, GPS
  - Text output/Human consumption
- **Separates the content of the message from the exchange of the message**

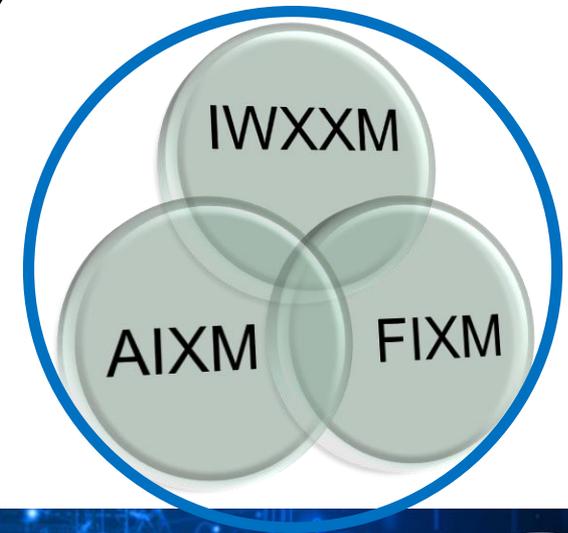


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# Why IWXXM

- IWXXM is a key component of SWIM
- SWIM core services will enable systems
  - Request and receive information when needed
  - Subscriptions for automatic receipt
  - Publishing information & services as appropriate
- One of three information sets used by aviation
  - Aeronautical Information (AIXM)
    - Routes, Aerodromes, FIRs
    - Traffic, Traffic Management
    - NOTAM
    - Airspace Restrictions
  - Flight Information (FIXM)
    - Flight Plan
    - Aircraft type/performance
    - Route preferences
  - Weather Information (IWXXM)



# Why IWXXM

- **Why would we move from a 1-2 line TAC METAR to a 5-page IWXXM METAR?**
  - Enables a commonality across the aviation system domains (e.g., weather, flight, and aeronautical information)
  - Allows the geographic position and time of information to be easily integrated with multiple systems
  - Supports ‘modernization’ of MET information
    - Higher resolution met information
    - User-definable visualization and integration
    - Modern/future communications infrastructure



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# Implementation Status

- **ICAO SAM Region**

- Brazil OPMET Databank ready to send/receive IWXXM
- Several States in SAM ready to exchange in IWXXM or indicate they will be by November, 2020
- SAM Regional Office
  - Has held workshops and seminars since 2018
  - Coordinating actively with States



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# Implementation Status

- **ICAO NACC Region**

- Since 2016 NACC has been actively promoting and supporting AMHS testing
- July 2018 – IWXXM workshop in Panama on July
- Cuba and United States initiated a bi-lateral test
  - Cuba is working on the conversion of OPMET messages to XML as IWXXM by developing a Communication Module (100%), Translator TAC to IWXXM for METAR (85%) and the Integration module (95%). In addition COCESNA (ANSP for Central America) is recently incorporated into the test with United States



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# Implementation Status

- **ICAO EUR/NAT & MID Region**

- Workshop on Implementing IWXXM for the exchange of OPMET data;
  - 31 May to 2 June 2016, Paris;
  - 11 of 14 OPMET exchange hubs from AFI, EUR, MID, APAC attended;
- IWXXM Implementation Workshop;
  - 17 to 18 May 2017, Paris
  - 56 participants from 23 States, 2 industries, ICAO and WMO



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# Implementation Status

- **ICAO EUR/NAT & MID Region**

- Regional OPMET Centers (ROC)s IWXXM Implementation

- London – expected Q4 2019;
- Toulouse – July 2017
  - Also functions as translation center for AoR Toulouse and London;
- Vienna – July 2017
  - Also functions as translation center for AoR Vienna
- Brussels – July 2017



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# Implementation Status

- **ICAO EUR/NAT & MID Region**
  - Regional OPMET Data Banks (RODB)s IWXXM Implementation
    - Request/reply functionality for retrieval of IWXXM data
  - IWXXM Implementation Workshop 5 to 6 November 2019



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# Implementation Status

- **ICAO APAC Region**
  - (hope to have updates by AITEC)



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# Implementation Status

- **U.S.**

- NWS will translate TAC to IWXXM and disseminate operationally by November, 2020
- Will transition to dual production of TAC and IWXXM at point of production after November, 2020
  - Automated Surface Observing System (ASOS)
    - Will translate TAC METAR into IWXXM for several years
- Has been doing bi-lateral testing with European, Asian, and Caribbean States



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# IWXXM Issues

- **ICAO Meteorology Panel**

- No changes to Traditional Alpha-numeric Code (TAC) messages
  - Unless clear safety issues
- After IWXXM v3.0 only information changes to go to IWXXM not TAC
- TAC to cease by 2026



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# IWXXM Issues

- **Questions about Geo-referencing**

- Example: SIGMET references the Flight Information Region (FIR).

- FIR is an Aeronautical (i.e., AIXM) element
- Should IWXXM message describe the aeronautical information; or reference the appropriate AIXM information

- Example: TAF doesn't use any other geo-referenced information (other than Location ID)

- IWXXM TAF could reference appropriate AIXM Aerodrome information
  - Location, elevation, runway configurations, services



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# IWXXM Supporting Operations

- **Future versions of IWXXM will look to provide added value over TAC versions**
  - Possibilities
    - 15, 5, or 1 minute METAR observations
    - Removal of rounded values in METARs
    - Added information within TAF for specific decision making
      - Supporting de-icing operations and decision making
      - Finer resolution ceiling and Cb forecast information
      - Enhanced uncertainty/probability information
      - Arrival Rate decision making



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# IWXXM Supporting Operations

- **IWXXM intended for machine-to-machine**
  - “Visualization” for human use will be end user responsibility
    - Text, Graphic, Stop light, etc.
  - TAC may be a “recommended” visualization for a while
    - Many legacy systems will not switch to ingesting IWXXM immediately at November, 2020
      - Even after 2026
    - Many users have asked for recommendations or guidance on visualization
      - Legacy Annex 3 TAC may be good guidance in the near term



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# IWXXM Supporting Operations

- **Users need to start thinking about integrating MET information (IWXXM) into decision making software systems**
  - Currently limited MET is utilized by software & human intervention is used to modify software output around weather hazards



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# IWXXM Supporting Operations

- **ICAO Meteorology Panel**

- Develops IWXXM requirements and WMO develops the schema/code
- New weather information built around user decisions and IWXXM format only
  - Moving from “product-centric” to “data-centric”
  - First time in history MET will be fully interoperable with Flight and Aeronautical information



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# Questions?

- **Thank you**
- **Contact:**
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  - Manager, Policy & Requirements Branch, Aviation Weather Division, NextGen, FAA
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