IWXXM Status & Operational Implementation

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Agenda

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

• ICAO APAC Region
  – (hope to have updates by AITEC)
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
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
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
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
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
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
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
Questions?

• Thank you

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