Brief History (1)

- March 2013: First draft by DMG (together with PT/MARIE & EC)

- Nov. 2013: AMD 76 to ICAO ANNEX 3 enabled states in the position to do so, to exchange OPMET data also in XML

- Nov. 2015: First version of CONOPS-Concept of Operations (EUR Doc 033)

- Oct. 2016: CONOPS adopted as global document by METP and renamed into "*Guidelines for the Implementation of OPMET Data Exchange using IWXXM*"
  - Each ICAO-Region to maintain a regional version to cover regional features ➔ EUR Doc 033 V2.0 issued on 23.09.2016

Brief History (2)

- Nov. 2016: AMD 77 to ICAO ANNEX 3 ➜ Recommendation that states should disseminate data also in IWXXM

- Nov. 2018: AMD 78 to ICAO ANNEX 3 ➜ Regulates that states shall disseminate IWXXM in parallel to TAC-data from 5. November 2020 onwards

1. **CRITERIA RELATED TO TAF**

1.1 TAF format

…

1.1.2   **Recommendation**.— *Until 5 November 2020*, TAF should be disseminated in ~~digital IWXXM GML~~ form in addition to the dissemination of the TAF in accordance with 1.1.1.

1.1.3   ~~TAF if disseminated in digital form shall be formatted in accordance with a globally interoperable information exchange model and shall use extensible markup language (XML)/geography markup language (GML).~~ From 5 November 2020, TAF shall be disseminated in IWXXM GML form in addition to the dissemination of the TAF in accordance with 1.1.1.

1.1.4   ~~TAF if disseminated in digital form shall be accompanied by the appropriate metadata.~~

Note.— *Guidance on* ~~the information exchange model~~ *IWXXM,* ~~XML/GML and the metadata~~ ~~profile~~ *is provided in the* Manual on the ICAO Meteorological Information Exchange Model (IWXXM) ~~Digital Exchange of Aeronautical Meteorological Information~~ *(Doc 10003).*

Why not staying with TAC?

- WMO decision to move to BUFR

- TAC data is not geo-referenced

- Coding exceptions are commonly used by states

- TAC often
  - contains typographical errors
  - is poorly structured
  - lacks validation

- Extension of TAC code not easily possible

- SWIM (System Wide Information Management) requires a machine-readable format for web services

What to find in EUR Doc 033?

- Current operations and capabilities
- Principles and requirements for the transition from TAC to IWXXM
- Description of the new functionalities

Current Functions and Capabilities(1)

- Originating Unit

- National OPMET Centre (NOC)

- Regional OPMET Centre (ROC)

- Interregional OPMET Gateway (IROG)

- Regional OPMET Database (RODB)

New Functionalities (1)

- Originating Unit
  - Current Tasks: Issue TAC-Data (METAR, TAF, SIGMET,..)
  - New Tasks
    - Data Producer: Issue in parallel IWXXM-versions
- NOC (National OPMET Centre)
  - Current Tasks
    - Collect & validate national data, compile into bulletins and send to responsible ROC
    - Supply national users with required data
  - New Tasks
    - Data Translator ➔ translate national TAC-data into IWXXM
    - Data Aggregator ➔ aggregate individual IWXXM-reports into a collection (bulletin)
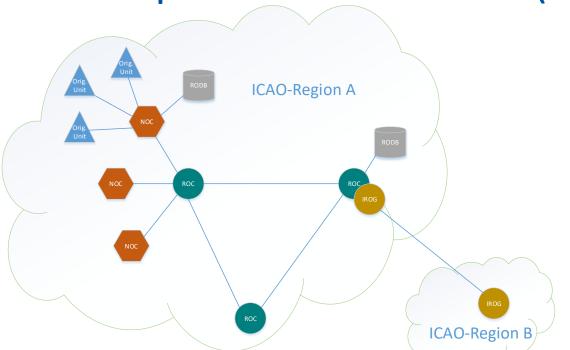   - Data Switch ➔ compress data before sending to responsible ROC

New Functionalities Definitions (2)

- ROC (Regional OPMET Centre)
  - Current Tasks
    - Collect and validate TAC OPMET data from NOCs in AoR
    - Correct invalid messages based on principles in EUR Doc 018, Chapter 12
    - Send TAC OPMET-data from AoR to other ROCs
    - Supply NOCs in AoR with required TAC OPMET-data
  - New Tasks
    - Data Switch
      - Collect IWXXM OPMET data from NOCs in AoR
      - Log information on received IWXXM OPMET data based on principles in EUR Doc 033, Chapter 8
      - Send IWXXM OPMET-data from AoR to other ROCs
      - Supply NOCs in AoR with required IWXXM OPMET-data
    - Data Translator
      - Translate TAC OPMET-data on behalf of states in the AoR (provision of service is under discussion)

New Functionalities Definitions (3)

- IROG (Interregional OPMET Gateway)
  - Current Tasks
    - Collect and validate TAC OPMET data from defined ICAO-region
    - Correct invalid messages based on principles in EUR Doc 018, Chapter 12
    - Send TAC OPMET-data from EUR-region to defined ICAO-region
    - Send TAC OPMET-data from defined ICAO-region to ROCs in EUR-region
  - New Tasks
    - Data Switch
      - Collect IWXXM OPMET data from defined ICAO-region
      - Send IWXXM OPMET-data from EUR-region to defined ICAO-region
      - Send IWXXM OPMET-data from defined ICAO-region to ROCs in the EUR-region
- RODB (Regional OPMET Databank)
  - Current Task ➜ Support request/reply functionalities for TAC OPMET-data
  - New Task ➜ Support request/reply functionalities for IWXXM OPMET-data

Comparison Old & New (1)

Comparison Old & New (2)

Exchanging IWXXM-Data (1)

- IWXXM-Data > AFTN-Limit of 1800 characters
- Solution ➜ Send as File using Extended AMHS
    - FTBP (File Transfer Body Part)
    - Compression
- File naming according to WMO naming convention
- Bulletin Header included in Filename (necessary for MET-Switch to rout data properly)

Exchanging IWXXM-Data (2)

WMO naming convention

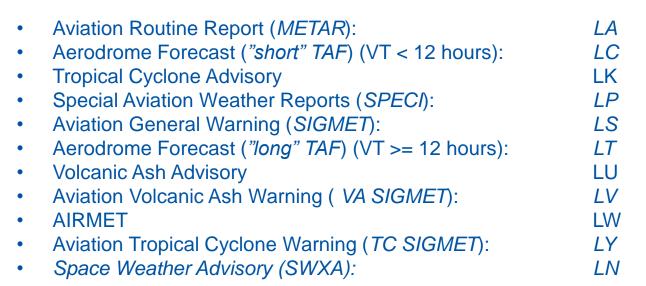**A**_TTAAiiCCCCYYGGgg*BBB*_**C**_CCCC_YYYYMMddhhmmss**.xml.gz**

- Elements in **black and bold** are fixed elements
- TTAAiiCCCCYYGGgg is the current WMO header with the date time group
- *BBB* is optional
- CCCC is the repeated CCCC part from TTAAiiCCCC
- YYYYMMddhhmmss is the date/time group when file is created
- **gz** is the Compression suffix of the officially defined compression method

Exchanging IWXXM-Data (3)

WMO T_1T_2 definitions for IWXXM data

- Aviation Routine Report (*METAR*):   *LA*
- Aerodrome Forecast (*"short" TAF*) (VT < 12 hours):   *LC*
- Tropical Cyclone Advisory   LK
- Special Aviation Weather Reports (*SPECI*):   *LP*
- Aviation General Warning (*SIGMET*):   *LS*
- Aerodrome Forecast (*"long" TAF*) (VT >= 12 hours):   *LT*
- Volcanic Ash Advisory   LU
- Aviation Volcanic Ash Warning (*VA SIGMET*):   *LV*
- AIRMET   LW
- Aviation Tropical Cyclone Warning (*TC SIGMET*):   *LY*
- *Space Weather Advisory (SWXA):*   *LN*

Operating Principles (1)

- Managing the Transition
  - Dedicated Group per Region beneficial (DMG in EUR)
  - METP WG-MIE (Meteorological Information Exchange) to co-ordinate on a global level
  - Exchange with other regions depending on sufficient capacity of AMHS-links as well as usage of same ext. AMHS profil
- Variances to the IWXXM Model
  - IWXXM 3.0 supports national extensions
    - Procedure to co-ordinate/inform about national extensions needed
    - Procedure to implement national extensions as new globally used element
    - Prevention of abuse of extensions

Operating Principles (2)

- Translation
  - Final target is to produce IWXXM at source
  - Translation shall only take place once to prevent different versions
  - No translation from IWXXM to TAC until 2026 (parallel phase)
  - Translation Centre and date/time of translation is included in IWXXM-message
  - If translation fails IWXXM message shall be produced without any MET-parameters but containing the original TAC-message

Operating Principles (3)

- Data Collection
  - Bulletin realized by "COLLECT" feature to be used for all data types
  - Aggregating Centre Identifier and date/time group in XML
  - No mixture of TAC and IWXXM data
  - Single file contains only one bulletin
- Transmission & Routing
  - Ext. AMHS will be used for exchange
  - Filename used as data identifier, no header on top of message

Operating Principles (4)

- RODB
  - IWXXM-requests use similar rules as for TAC
  - Answers may include operational as well as non-operational IWXXM-messages
  - In case no full AMHS-path available (non-delivery report received by databank) error reply sent in IA5-bodypart to user

Operating Principles (5)

- Aeronautical Information Metadata
  - Partly included as metadata in IWXXM (Name, aerodrome coordinates)
  - Problem especially for Translation Centres to have this available (e.g. coordinates of airport, FIR shape)
  - More metadata available from AIXM-model which could be linked via the AIRM (ATM Information Reference Model)