Global Harmonization Through Collaboration

Meteorological Information Exchange Model; update

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Federal Aviation Administration

AIR TRANSPORTATION INFORMATION EXCHANGE CONFERENCE – (FEATURING AIXM, WXXM AND FIXM)

August 28, 2012 - August 31, 2012
NOAA Auditorium and Science Center
Silver Spring, Maryland

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Date: *August 28th, 2012*

Expectation from last year

Weather Information Exchange Model **Version 2.0**

- A MET Information Exchange Model suite
  - Fully aligned between FAA and EUROCONTROL
  - Fully aligned in and between NextGen and SESAR
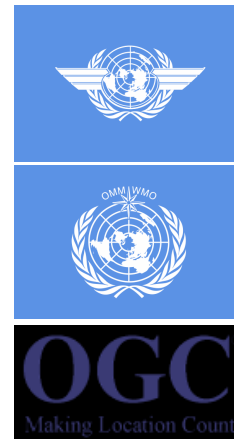 - Fully aligned between US and Europe

What you will get

- **A MET Information Exchange Model suite**
  - Fully aligned between FAA and EUROCONTROL
  - Fully aligned in and between NextGen and SESAR
  - Fully aligned between US and Europe

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  - Fully aligned with ICAO
  - Fully aligned with WMO
  - Fully aligned with OGC

Development philosophy

- Since 2009 for the "US and Europe" developments
  - Not too frequent updates
  - Incremental stepping of developments, no 'big bang'
  - Open/transparent decision making
  - Extension mechanism for regional/national difference
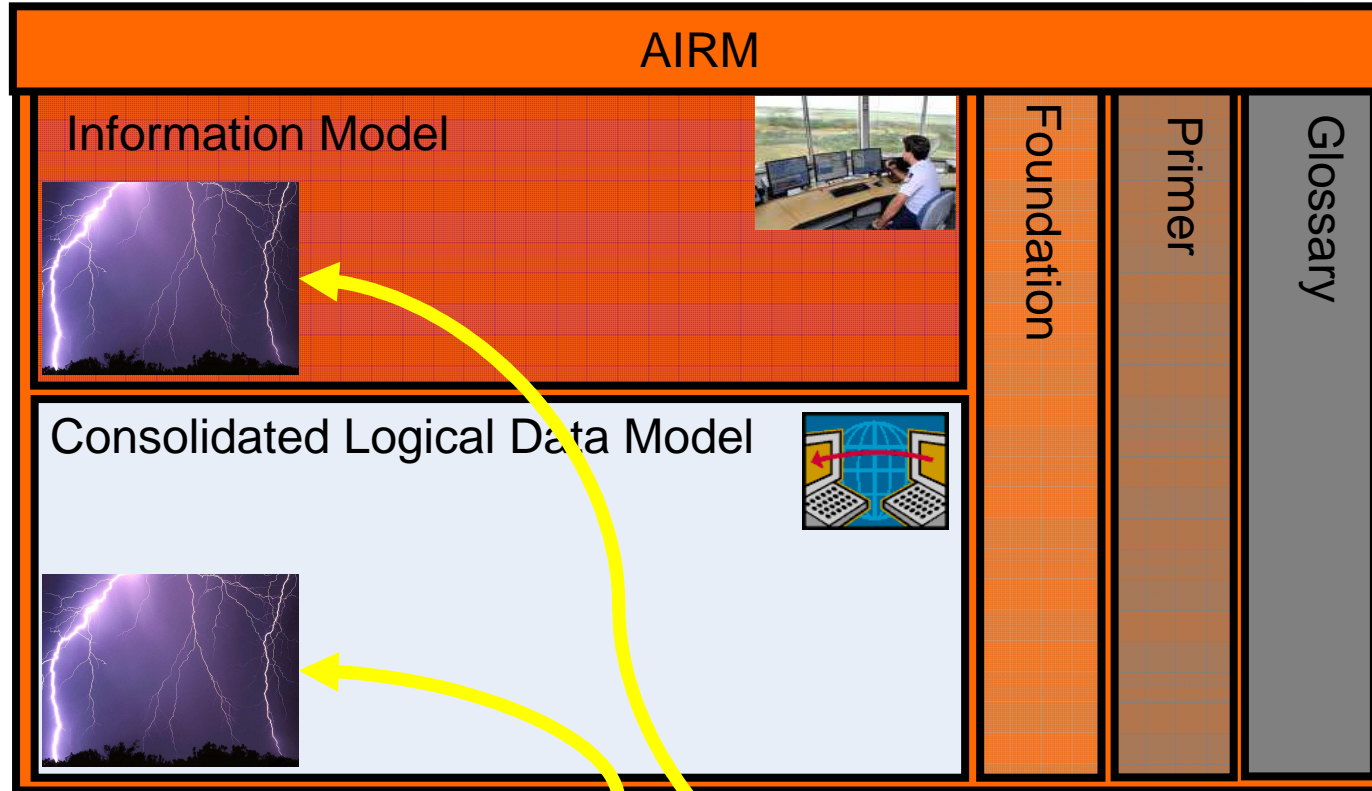 - SESAR: Adherence to an ATM Information Reference: AIRM

SESAR AIRM

What we achieved till now

- Understanding with WMO and ICAO on roles, responsibilities and scope for a global framework for MET information exchange
  - User requirements for MET could differ around the globe
  - MET information capabilities could differ around the globe
- Clear agreement on development and release planning

The High Level Deal at UN level

- Focused support of FAA/EUROCONTROL on ICAO and WMO developments

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Development philosophy

- Applying the same principles on a global level
  - Open
  - Phasing
  - Inclusive
  - Flexibility

International Standardisation

The essence

- Till now:
  - WXXM covered the full spectrum of aeronautical meteorological information exchange based on an ISO/OGC/W3C foundation

Forecasts

METAR

Wind & temp data

Observations

TAF

Trend

Volcanic Ash Information

Convective Weather info
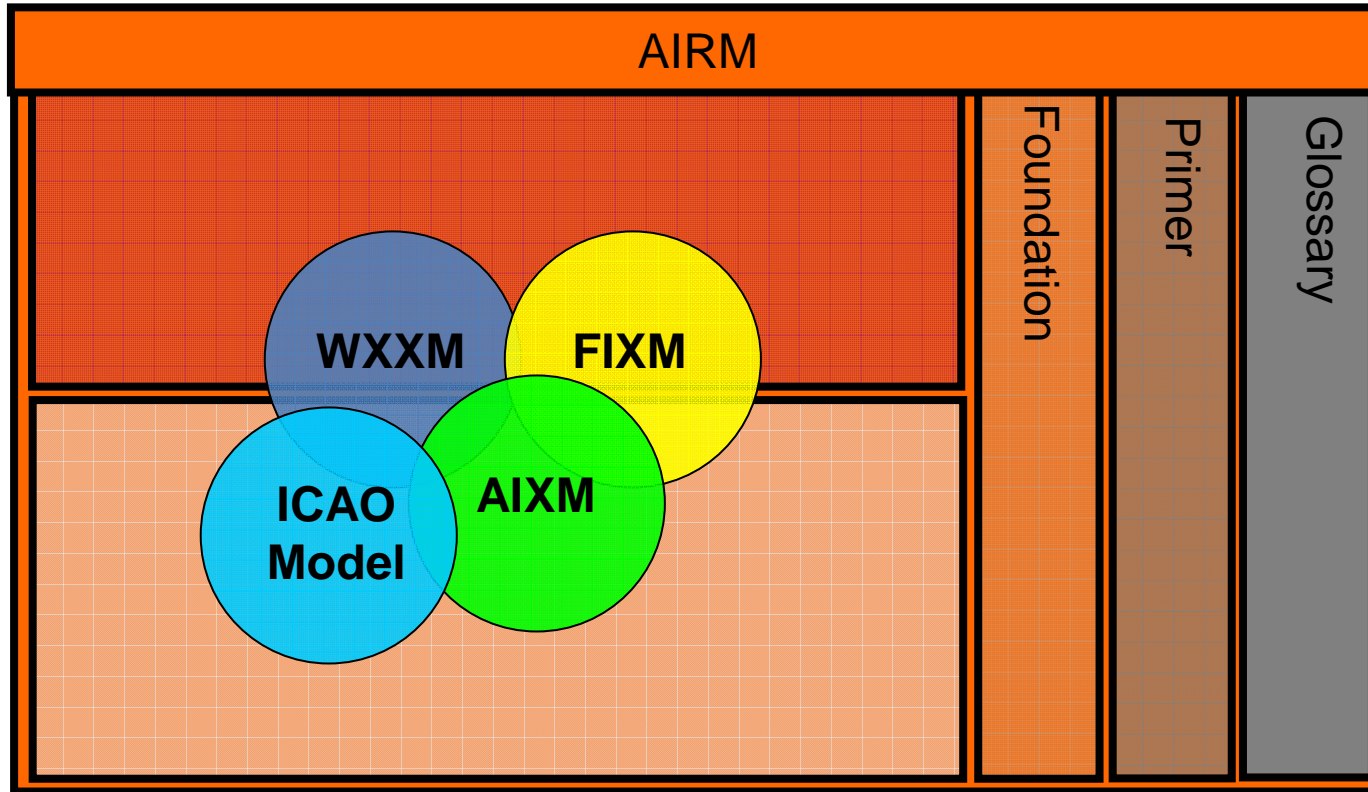
Warnings

SIGMET

And more....

The essence

- From now:
  - WMO Model covers the core meteorological information constructs required for aeronautical meteorological information exchange and for other business domains
  - ICAO covers the specific exchange requirements for a selected set of ICAO Annex 3 services using the ISO/OGC/W3C foundation and WMO Model
  - WXXM v2 = WXXM v1 minus ICAO Model plus adding WMO model to its foundation
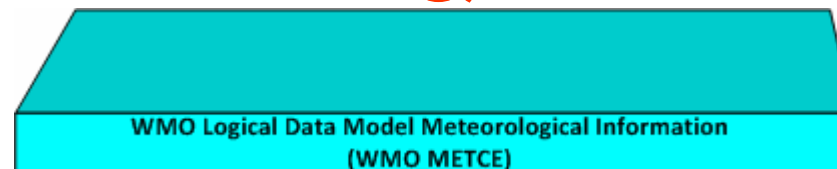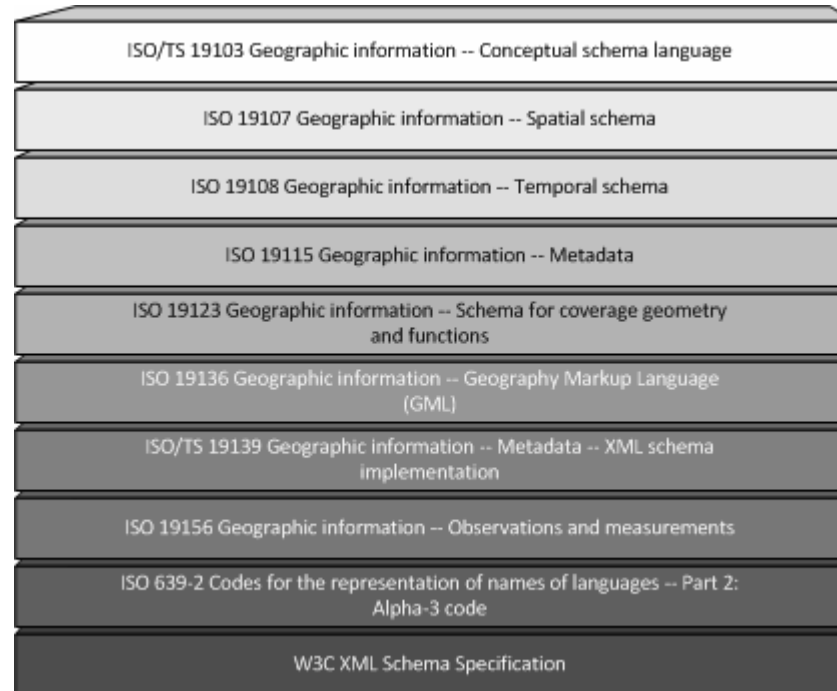
The essence explained

Foundation

ISO/TS 19103 Geographic information -- Conceptual schema language

ISO 19107 Geographic information -- Spatial schema

ISO 19108 Geographic information -- Temporal schema

ISO 19115 Geographic information -- Metadata

ISO 19123 Geographic information -- Schema for coverage geometry and functions

ISO 19136 Geographic information -- Geography Markup Language (GML)

ISO/TS 19139 Geographic information -- Metadata -- XML schema implementation

ISO 19156 Geographic information -- Observations and measurements

ISO 639-2 Codes for the representation of names of languages -- Part 2: Alpha-3 code

W3C XML Schema Specification

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WMO Logical Data Model Meteorological Information (WMO METCE)
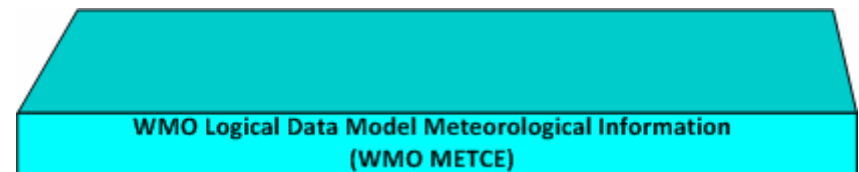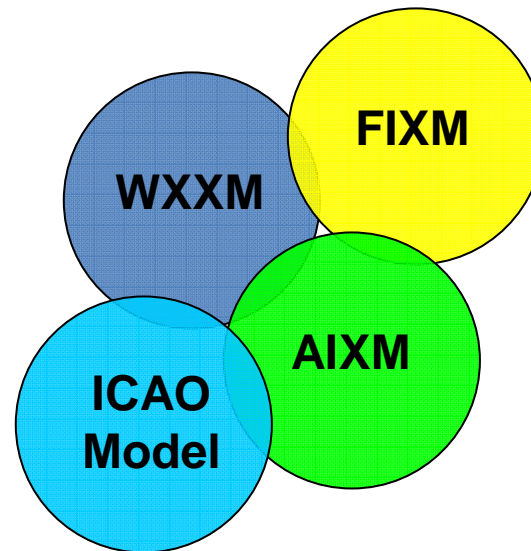
WMO Model

- WMO Model covers the core meteorological information constructs required for aeronautical meteorological information exchange and for other business domains

- From WXXM perspective:
  - Almost all (generic) MET under the <wx> namespace will be replaced by the WMO Model

- Full brief on WMO METCE: Day 2 - WXXM break-out session

WMO Logical Data Model Meteorological Information
(WMO METCE)

ICAO Model

ICAO Model

- ICAO covers the specific exchange requirements for a selected set of ICAO Annex 3 code representations using the ISO/OGC/W3C foundation and WMO Model
- The ICAO Model released for applicability in November 2013 includes exclusively some Traditional Alphanumerical Code representations of MET information
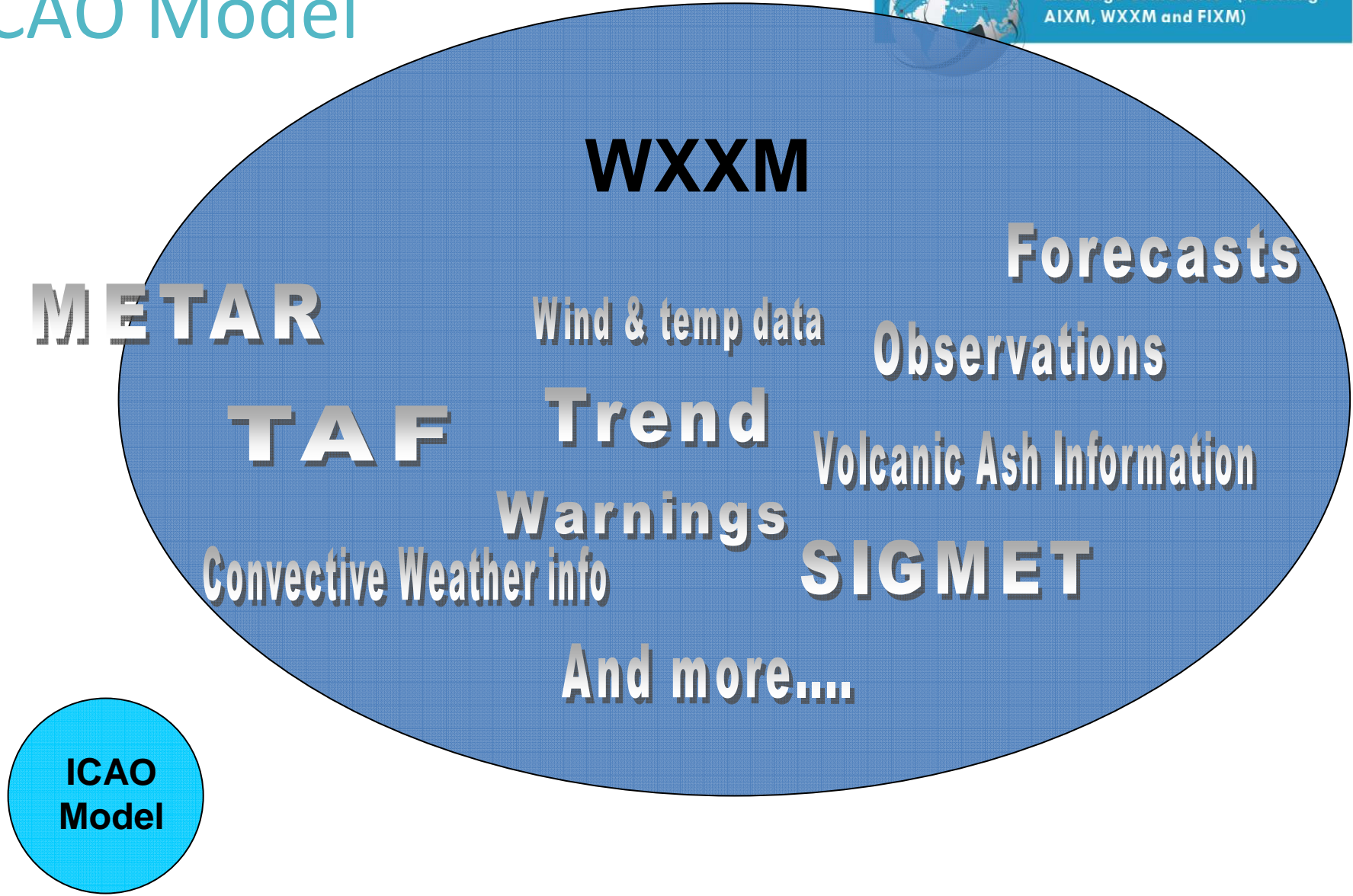
ICAO
Model

ICAO Model

WXXM

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And more....

ICAO Model

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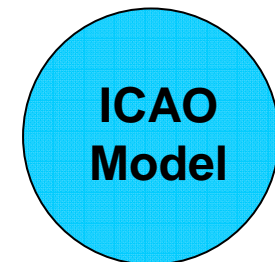
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ICAO Model, background

- Discussions between September '11 and February '12 on changes to ICAO Annex 3 provisions

ICAO Model
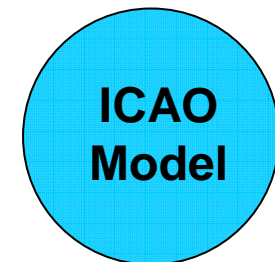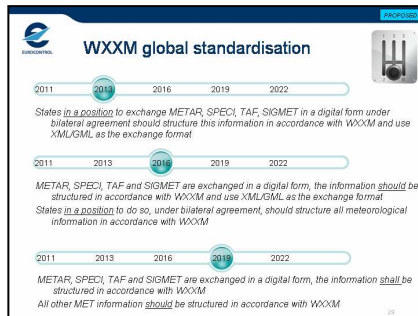
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WXXM global standardisation

2011   **2013**   2016   2019   2022

States in a position to exchange METAR, SPECI, TAF, SIGMET in a digital form under bilateral agreement should structure this information in accordance with WXXM and use XML/GML as the exchange format

'the ICAO Model'

2011   2013   **2016**   2019   2022

METAR, SPECI, TAF and SIGMET are exchanged in a digital form, the information should be structured in accordance with WXXM and use XML/GML as the exchange format

States in a position to do so, under bilateral agreement, should structure all meteorological information in accordance with WXXM

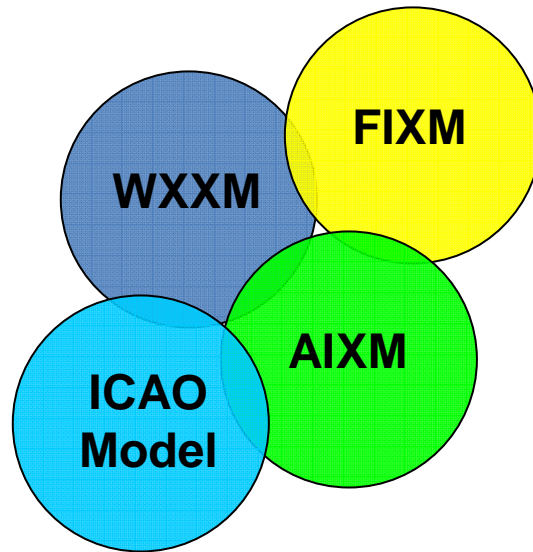2011   2013   2016   **2019**   2022

METAR, SPECI, TAF and SIGMET are exchanged in a digital form, the information shall be structured in accordance with WXXM

All other MET information should be structured in accordance with WXXM

WXXM v2

WXXM v2, challenges

- Directly ahead:
  - Re-design to incorporate 'new' foundation element (WMO METCE)
  - Re-design to incorporate updated ISO/OGC standards (e.g. O&M 2)
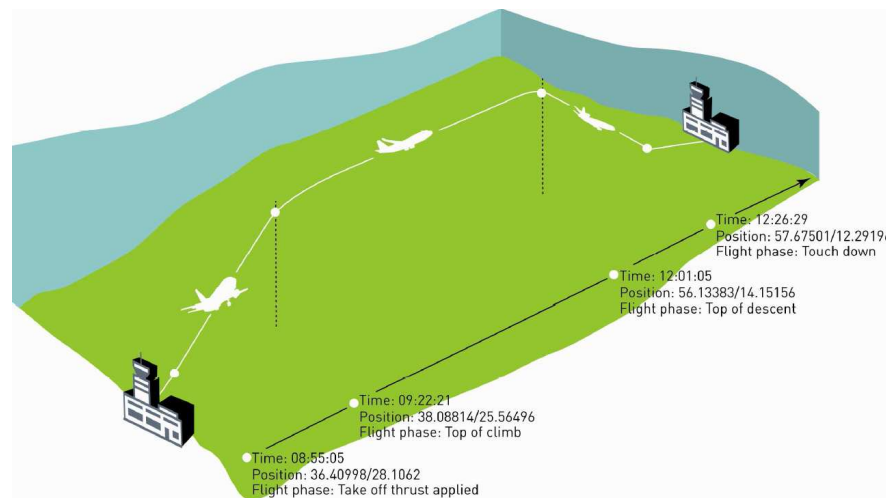 - Re-design to exclude elements covered by ICAO Model

- More identified

WXXM v2, more challenges

- Move away from a product-centric environment
  - Data-centric needs to support 4D trajectories

  - Add, change and remove from the baseline WXXM
    - ICAO products represented by ICAO Model

WXXM v2, more challenges ....., or the real challenge

- Global Information Management Framework
  - Resolved MET semantic interoperability, but....
  - Is this always interoperable with other domains, standards and guidance?
  - Is 'the MET high level deal' the correct sort of deal?
  - Are the observed differences of approach in 'regulatory' approach harmful to global interoperability

- We need a global Air Transport reference

WXXM v2, more challenges
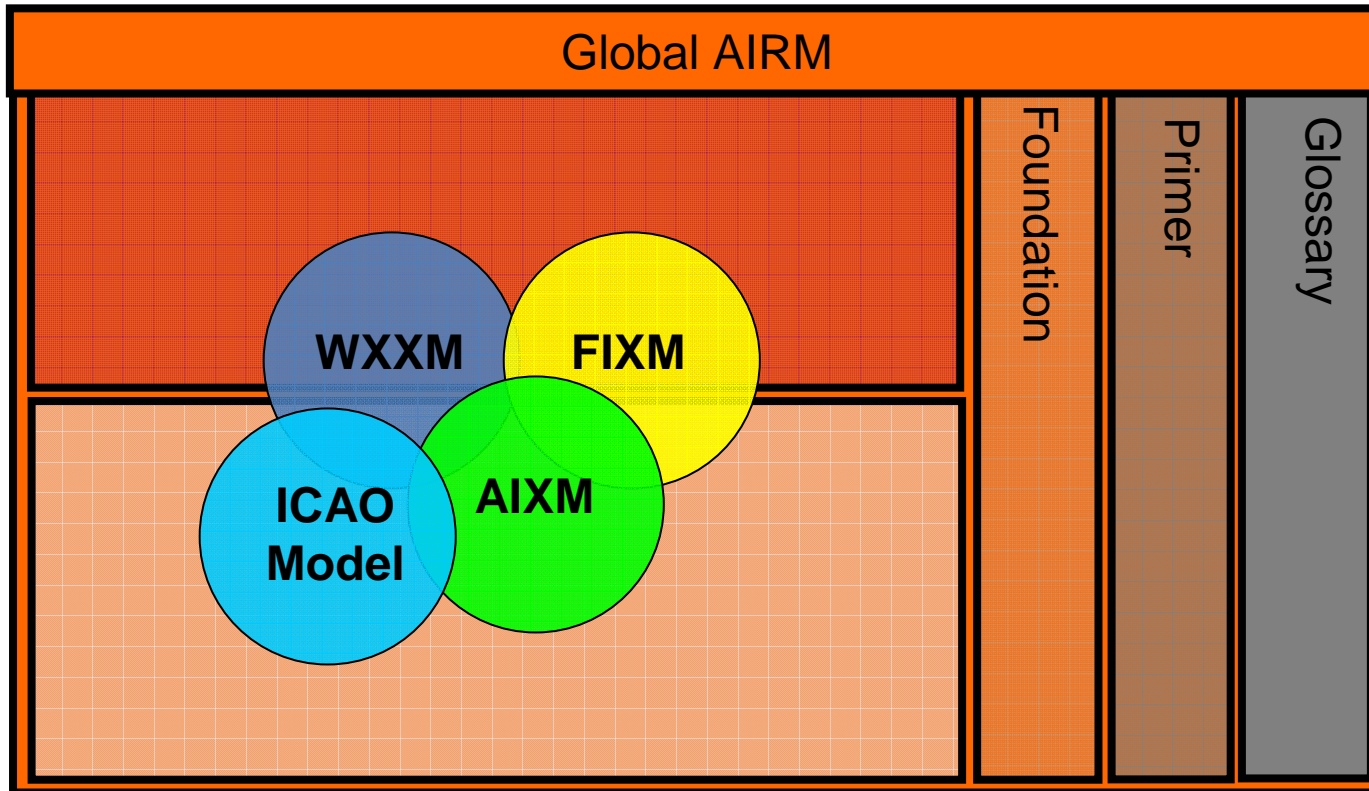
Timelines

- ICAO Model RC1 & WMO METCE RC1: October 2012
- ICAO Model RC2 & WMO METCE RC2: February 2013
- ICAO Model & WMO METCE released: July 2013
- WXXM v2: Spring 2013
- WXXM v2.x: from September 2013
- WXXM v3 (global interoperability framework): ....

- Tomorrow:

  Everything explained better ☺ ; ATIEC WXXM break-out session

...remember from this

- Focused investment over last 12 months on global MET interoperability aspects
  - WXXM-, ICAO- and WMO-communities working together
  - ICAO & WMO components nearly finished
  - WXXM v2 Spring 2013
- Aviation MET semantic interoperability almost resolved
- Now to fit it into a global air transport information framework

Questions

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