SESAR
Aeronautical and Meteorological Information Services

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Today's partners for Tomorrow's aviation

SESAR Joint Undertaking

- The Single European Sky ATM Research (SESAR) Programme is the European equivalent to NextGen.

- SESAR aims to eliminate the fragmented approach to European ATM, transform the ATM system, synchronise all stakeholders and federate resources.

- The Development phase (2008-2013) will produce the required new generation of technological systems, components and operational procedures as defined in the SESAR ATM Master Plan and Work Programme.

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SESAR Joint Undertaking

- **16 members representing the whole aviation community.**
  (Several members are made up of consortiums, which brings the total number of organisations directly and indirectly bound to SESAR to up to 35).
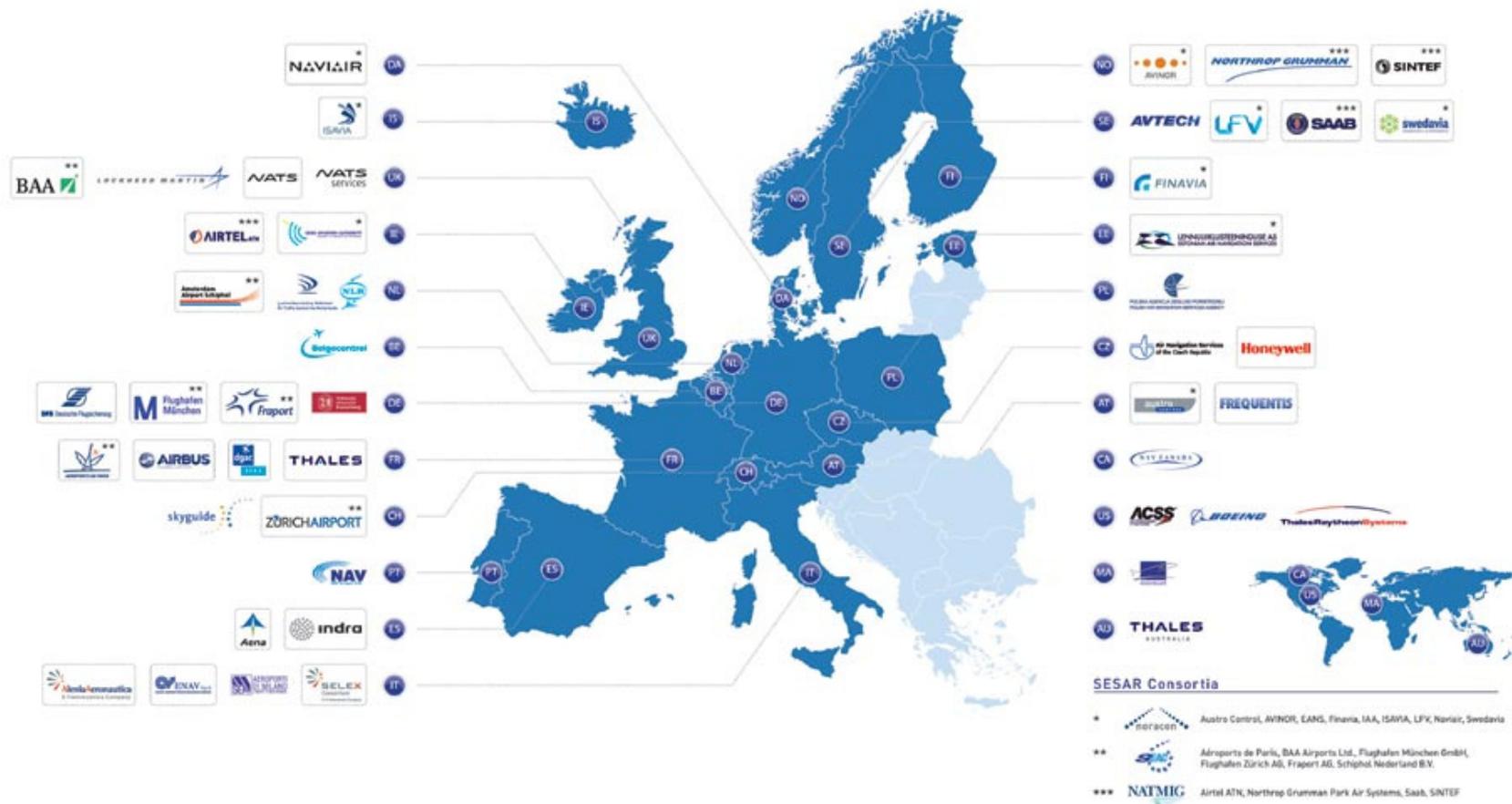
SESAR Joint Undertaking

- The almost 300 SESAR JU projects are basically divided into:
  - Operational Projects (main contribution from ANSPs)
  - System Projects (main contribution from industry)
  - Information Management/SWIM Projects (rather equal contribution from ANSPs, EUROCONTROL and industry)
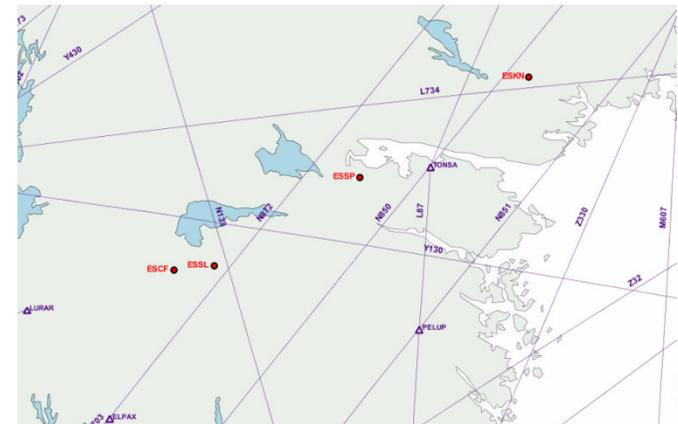
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AIM/MET in SESAR

- ## IM/SWIM Projects
  - Project 08.01.04 - Information Modelling Aeronautical Info. Domain
  - Project 08.01.06 - Information Modelling Meteorological Domain
  - Project 08.03.03 - Identify and Develop Aeronautical and Meteorological ATM Information Services
  - Work Package 14 Projects - System Wide Information Management (SWIM)

- ## System/Technical Projects
  - Project 09.19 - SWIM Air-Ground Capability
  - Project 09.31 - Aeronautical databases
  - Project 09.48 - AIS/MET Serv. & Data Distr.
  - Project 13.2.2 - AIM sub-system definition

- ## Operational Projects…

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Project 08.03.03: AIM/MET Services

- Project 08.03.03 consists of the following partners:
  – AENA (Spain)
  – DFS (Germany)
  – DSNA (France)
  – EUROCONTROL
  – FREQUENTIS
  – NORACON (Austria, Denmark, Estonia, Finland, Iceland, Ireland, Norway and Sweden. In 08.03.03 represented by AustroControl and LFV)
  – THALES
- NORACON is the project leader

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Proj. 08.03.03: AIM/MET Service Models

- AIM/MET Service models to be included in the Information Service Reference Model (ISRM) covering all domains, to be used by System/Technical projects building the ATM systems connected to the SWIM network

- Service Models eases ATM system software development

- Modelling tool allows generation of e.g. Java classes for the addressed services

- The service models are done using Service Oriented Architecture Modelling Language (SoaML) and based on the Business Process Modelling Notation (BPMN) diagrams derived from the operational requirements.

Project 08.03.03: Current status

- Started "Bottom-Up" in 2010 with a few "first shot" service models. Example services:
  - Aerodrome Mapping Information Service (AMIS)
  - Taxiway Status Information Service (TSIS)
  - Volcanic Ash Mass Concentration Information Service (VAMCIS)
  - Winds Aloft Information Service (WAIS)
  - Airspace Reservations Information Service (ARESIS)
- Now changing to a "Top-Down" approach.
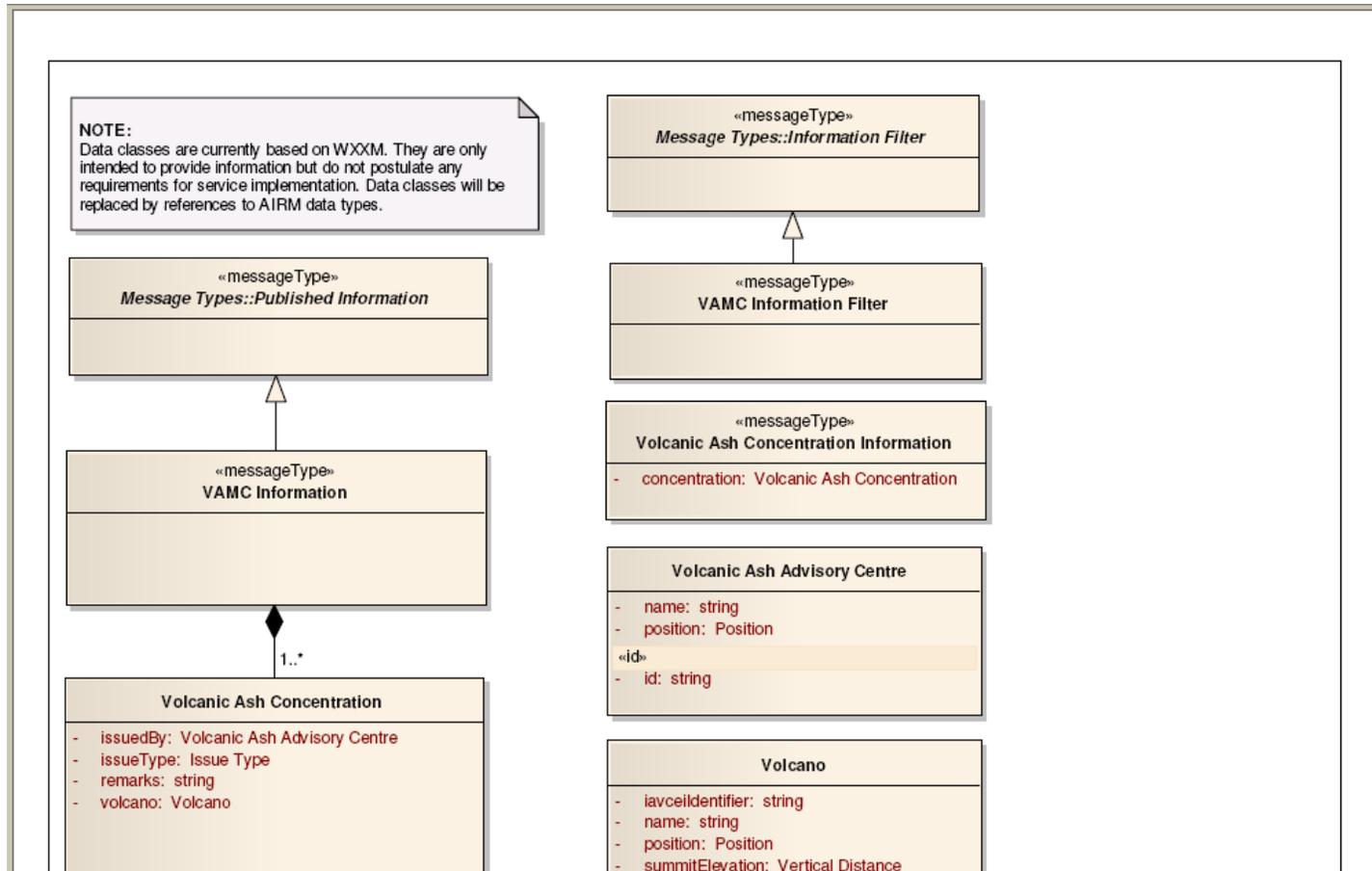- Service Models (Deliverable D04 second iteration) delivered June 2011

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Example of Business Process Modelling:
Volcanic Ash Mass Concentration Information Service
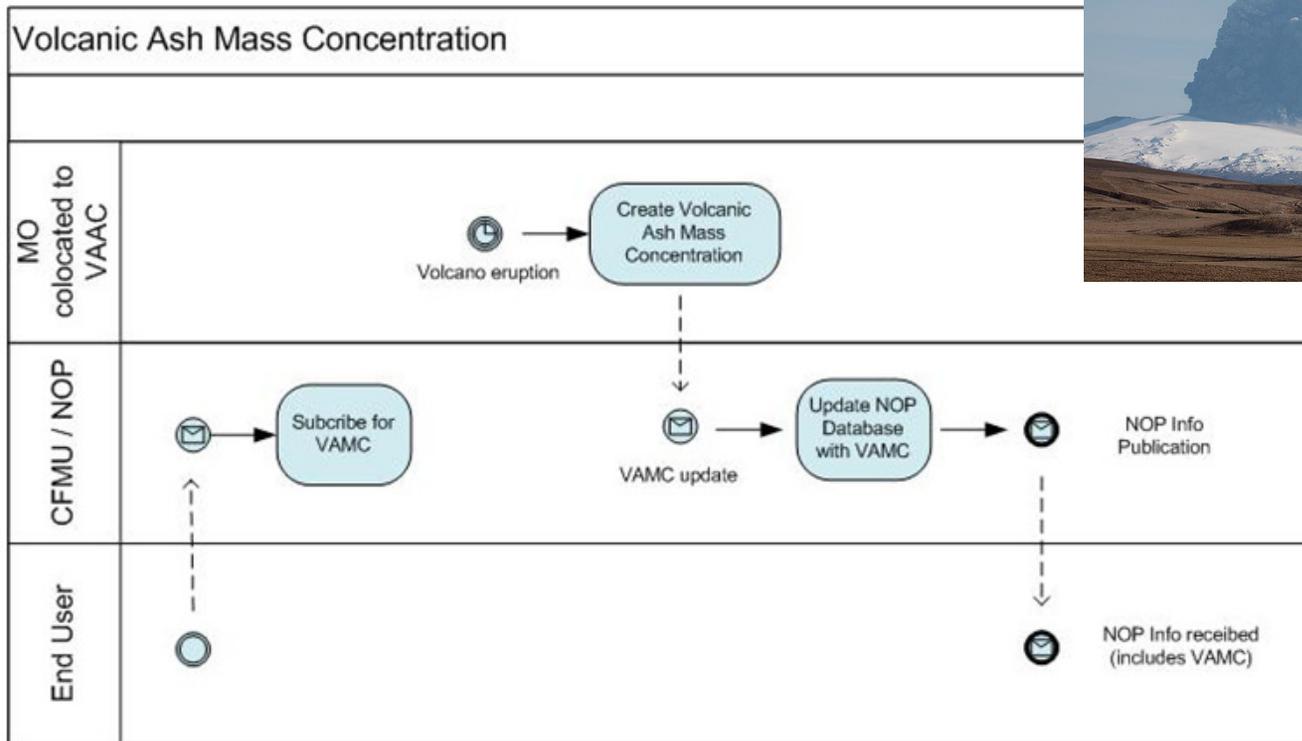
Example from Service Model: SoaML VAMC Architecture
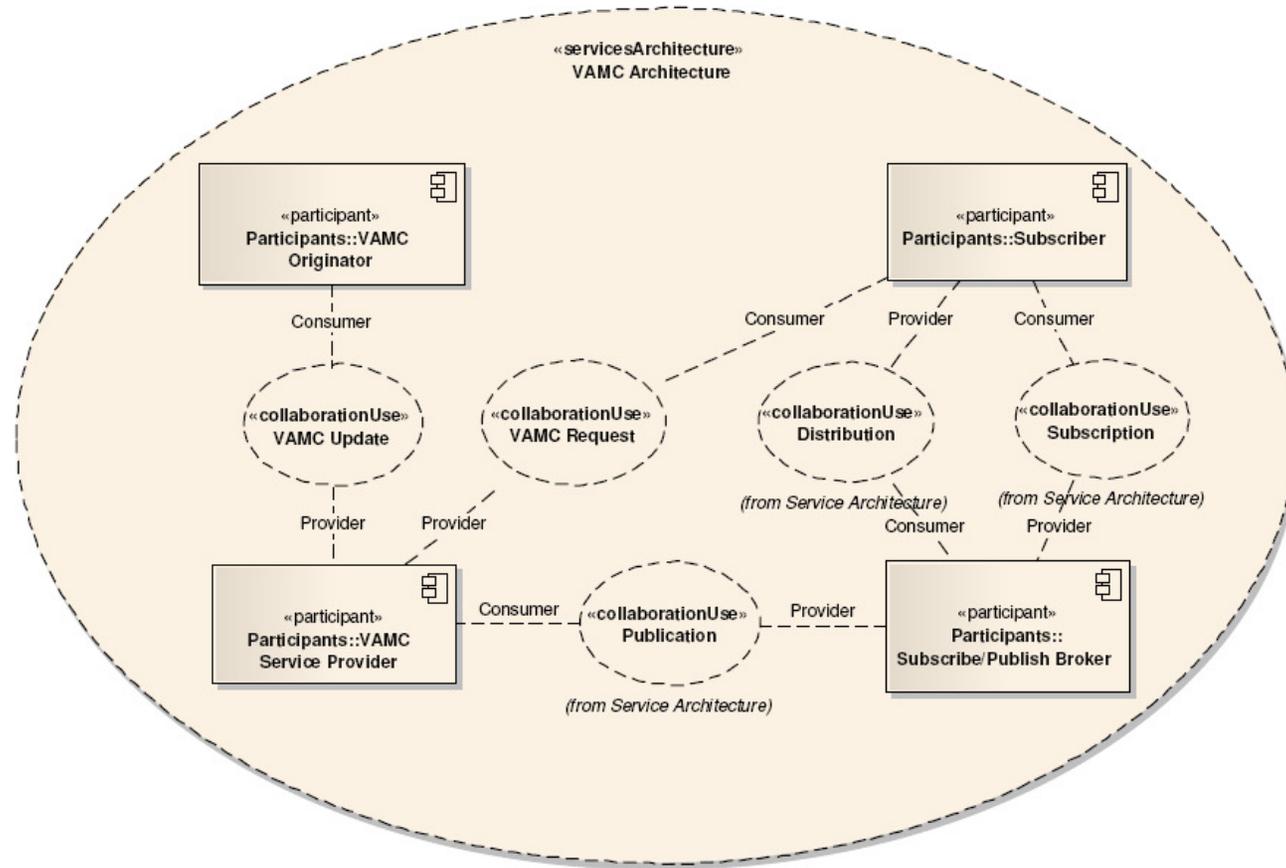
# Example from Service Model: SoaML VAMC Message

Upcoming work 2011

- Identify operational requirements and develop service models for more "generic services", e.g.:
  - Access Aeronautical Data Service
  - Publish/Subscribe Aeronautical Data Service

  …in cooperation with airspace users

- Enhancement of already delivered models, e.g.:
  - Volcanic Ash Mass Concentration Information Service
  - Aerodrome Map Information Service
  - Winds Aloft Information Service
  - etc

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Upcoming work 2011

- Contribute to a generic IM/SWIM architecture for the developed services (picture below DRAFT only):

Upcoming work 2011 and beyond

2011 → **2016**
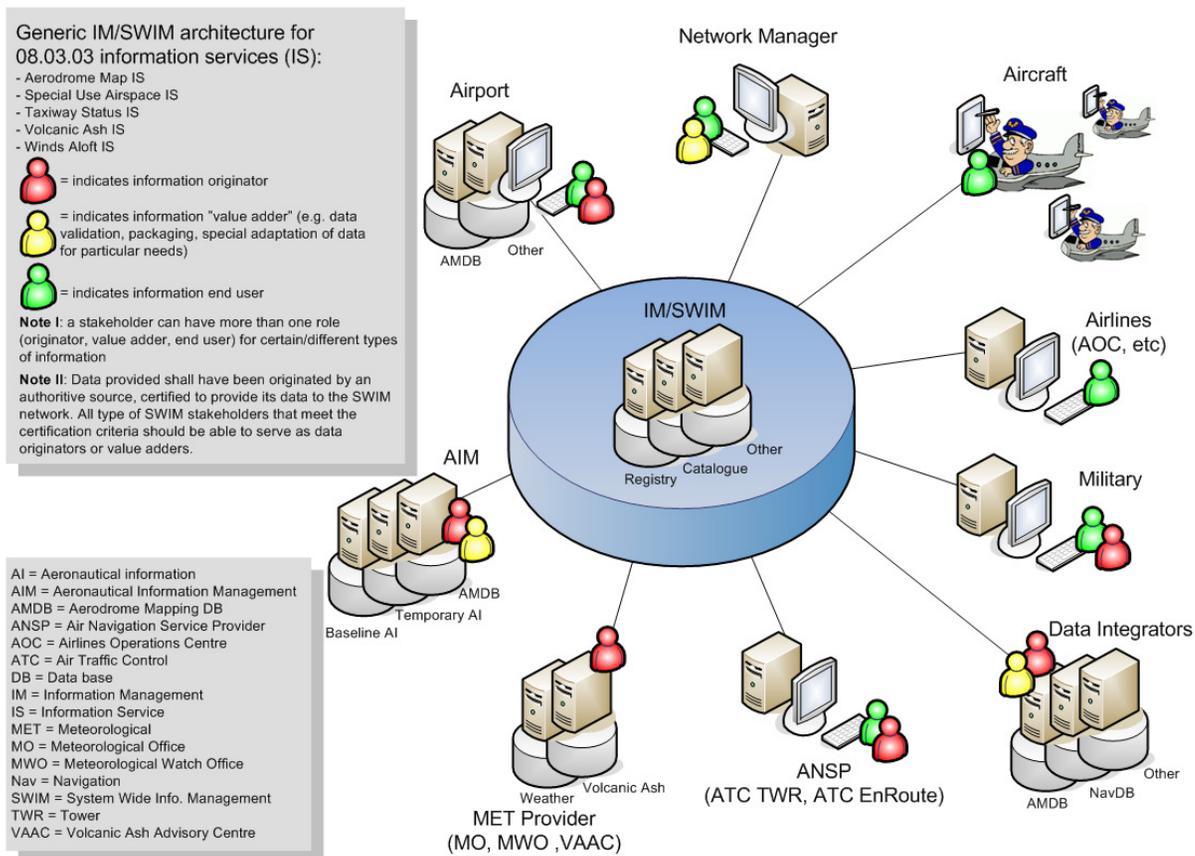
- Further service model development
  - e.g. AIS/MET air-ground Data Link Services
- Validation activities
 - In cooperation with Operational and System projects

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Upcoming work 2011 and beyond

Example of ongoing/upcoming validation activity:

Volcanic Ash Mass Concentration Information Service (VAMCIS):

- Information via data link to cockpit – ongoing
- Visualisation on Electronic Flight Bag (EFB) – ongoing
- Information from Met Office/VAAC according to AIRM/WXXM 1.1.3 – 2012
- Information from Met Office/VAAC to End-User via SWIM network – 2012
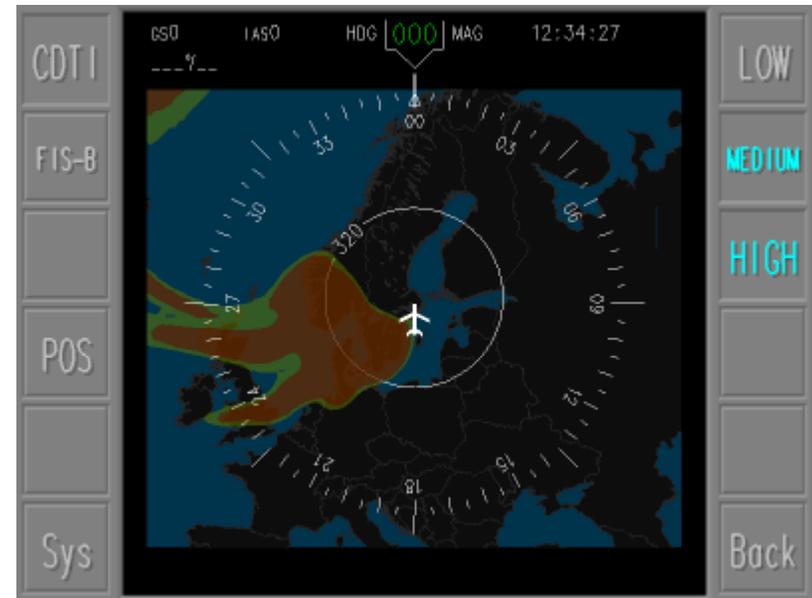
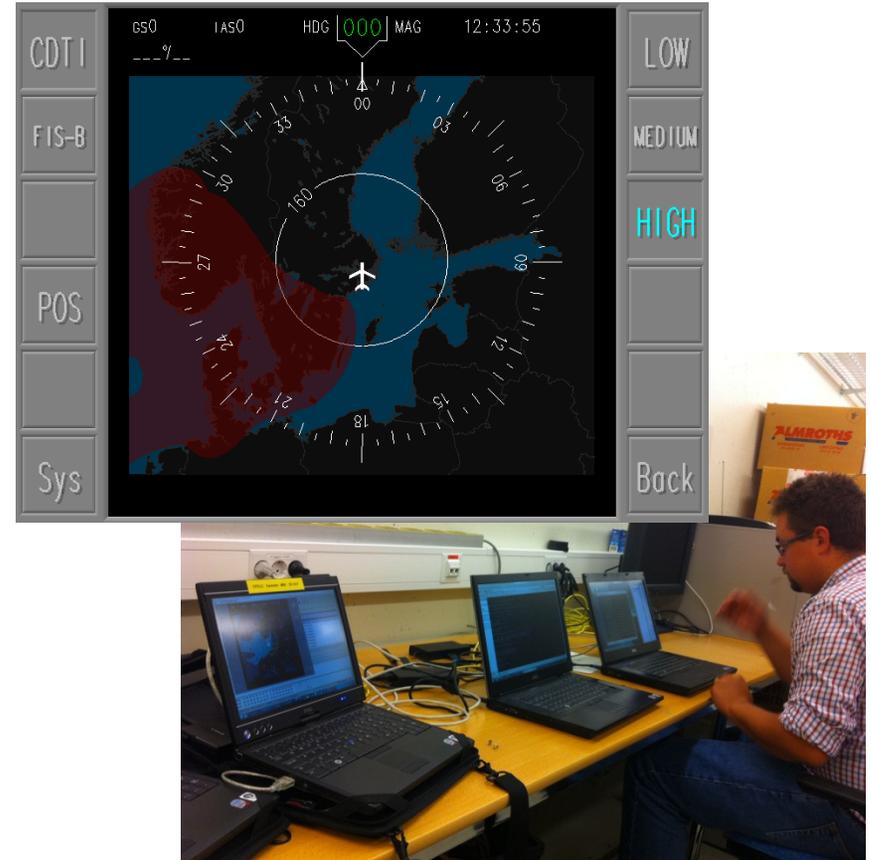EFB screen shot showing medium and high Volcanic Ash Mass Concentration over Europe

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Upcoming work 2011 and beyond

Example of validation objectives:

VAMCIS via Data Link:

- Big messages – Low bandwidth; are the suggested compression techniques sufficient?

- Current .csv format compared to AIRM/WXXM 1.1.3

- Reasonable update rates?

- ATN/IPS

- Coherence of information between ground user systems and airborne user systems

Upper left: EFB screen shot showing high Volcanic Ash Mass Concentration over Scandinavia
Lower right: VAMCIS Lab testing, August 25, 2011

Summary: Challenges

- So far the work with SESAR AIM/MET service models has been conducted using a bottom-up approach, mostly due to lacking guidance on architectural framework, business processes, etc.

- Bottom-up OK but will only work so far… Top-down also needed to be able to progress and meet overall objectives: renewing and harmonising the European ATM system

Summary: Challenges

- Ensure interoperability between SESAR SWIM, NextGen SWIM and the rest of the world…

- Avoid divergance between existing models, standards and ongoing efforts (AIXM, WXXM, ICAO AIS-to-AIM, RTCA SC206, and the European ATM Information Reference Model (AIRM) as well as the Information Service Reference Model (ISRM). Parallell development and coordination needed (and ongoing…)

- Ensure alignment both "cross-domain" as well as "cross-atlantic"

Thank you!

- For more information on SESAR Joint Undertaking in general go to: www.sesarju.eu

- For news updates on SESAR JU Project 8.3.3 in specific go to: www.d-aim.aero

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