Status on SWIM planning & deployment in Europe

Hubert LEPORI
EUROCONTROL NMD/INF/IAC
hubert.lepori@eurocontrol.int
What? Six ATM functionalities to be implemented within a specified geographical scope by specified dates.

Who? Civil and military airspace users, ANSPs and airport operators, The European Network Manager, MET providers.

Common Project One

When?
EU PCP Dec 2023
EU CP1 Dec 2025
Dec 2027

EU COMMISSION IMPLEMENTING REGULATION (EU) 2021/116

of 1 February 2021


(Text with EEA relevance)
Six ATM functionalities to be implemented within a specified geographical scope by specified dates.

Civil and military airspace users,

ANSPs and airport operators

The European Network Manager

MET providers

When?

EU PCP

2014

EU CP1

Dec 2027

Dec 2025

Dec 2023

...

AF1: Extended AMANDMAN

AF2: Aircraft Integration and throughput

AF3: Flexible Airspace Management and free route airspace

AF4: Network collaborative management

AF5: SWIM

AF6: Initial trajectory information sharing
Common Project One

European SWIM Registry

European Aviation Common PKI

SESSION 2

AF 5: SWIM

- Common infrastructure components
- SWIM yellow profile technical infrastructure and specifications
- Aeronautical info. exchange
- Meteorological info. exchange
- Cooperative network info. exchange
- Flight info. exchange
European SWIM Registry

https://eur-registry.swim.aero/
Fulfilling the requirements from the ECTL specification ensures that anticipated PANS-IM requirements on service overview are satisfied.
Common Project One

AF 5: SWIM

- Common infrastructure components
- SWIM yellow profile technical infrastructure and specifications
- Aeronautical info. exchange
- Meteorological info. exchange
- Cooperative network info. exchange
- Flight info. exchange

**FF-ICE/R1 Services Implementation by EUROCONTROL**
Common Project One

AF 5: SWIM

Common infrastructure components
SWIM yellow profile technical infrastructure and specifications
Aeronautical info. exchange
Meteorological info. exchange
Cooperative network info. exchange
Flight info. exchange

What is FF-ICE?

FF-ICE/R1 Services Implementation by EUROCONTROL
What is FF-ICE?

FF-ICE/R1 Services Implementation by EUROCONTROL

Common Project One

AF 5: SWIM

Common infrastructure components

SWIM yellow profile technical infrastructure and specifications

Aeronautical info. exchange

Meteorological info. exchange

Cooperative network info. exchange

Flight info. exchange
From an ICAO perspective, the implementation of FF-ICE/R1 Services is on a need basis. Envisaged applicability date is Nov 2024.

What is FF-ICE?

FF-ICE/R1 Services Implementation by EUROCONTROL

AF 5: SWIM

Common infrastructure components
SWIM yellow profile technical infrastructure and specifications
Aeronautical info. exchange
Meteorological info. exchange
Cooperative network info. exchange
Flight info. exchange
**FF-ICE/R1 Services Implementation by EUROCONTROL**

Evolution of service design

Evolution of data format to use latest FIXM components

Satisfying SWIM requirements

---

<table>
<thead>
<tr>
<th>Year</th>
<th>Flight Preparation Service</th>
<th>Flight Filing Service</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td></td>
<td>NM 20.0</td>
</tr>
<tr>
<td>2019</td>
<td></td>
<td>NM 22.0</td>
</tr>
<tr>
<td>2020</td>
<td>Phase 1</td>
<td>NM 23.0</td>
</tr>
<tr>
<td>2021</td>
<td></td>
<td>NM 24.0</td>
</tr>
<tr>
<td>2022</td>
<td>Phase 2</td>
<td>NM 25.0</td>
</tr>
<tr>
<td>2023</td>
<td>eFPL distribution (in IFPS Zone)</td>
<td>NM 26.0</td>
</tr>
<tr>
<td>2024</td>
<td>Planning service</td>
<td>NM 27.0</td>
</tr>
<tr>
<td></td>
<td>Notification service</td>
<td>NM 28.0</td>
</tr>
</tbody>
</table>

Ready for pre-operational testing and validation by eAUs and CFSPs in April 2021
FF-ICE/R1 Services implemented by EUROCONTROL satisfy the anticipated PANS-IM requirements.
<table>
<thead>
<tr>
<th>Year</th>
<th>Phase 1</th>
<th>Phase 2</th>
</tr>
</thead>
<tbody>
<tr>
<td>2018</td>
<td>NM 22.0</td>
<td>NM 26.0</td>
</tr>
<tr>
<td>2019</td>
<td>NM 23.0</td>
<td>NM 27.0</td>
</tr>
<tr>
<td>2020</td>
<td>NM 24.0</td>
<td>NM 28.0</td>
</tr>
<tr>
<td>2021</td>
<td>NM 25.0</td>
<td></td>
</tr>
<tr>
<td>2022</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2023</td>
<td></td>
<td></td>
</tr>
<tr>
<td>2024</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Requirements for semantic interoperability: AIRM alignment**

https://airm.aero/
### Fixm 4.2.0 to Airm 1.0.0

Use the search field to filter. Click on Fixm information, data concepts or types to see their semantic correspondence to the AIRM.

<table>
<thead>
<tr>
<th>Information Concept</th>
<th>Data Concept</th>
<th>Definition</th>
<th>Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>ActivationType</td>
<td>PLAN_TO_COMMENCE</td>
<td>unknown</td>
<td>enum value</td>
</tr>
<tr>
<td>ActivationType</td>
<td>PLAN_TO_ATTAIN</td>
<td>unknown</td>
<td>enum value</td>
</tr>
<tr>
<td>AerodromeReferenceType</td>
<td>extension</td>
<td>An extension...</td>
<td>AerodromeReferenceExtensionType</td>
</tr>
<tr>
<td>AerodromeReferenceType</td>
<td>referencePoint</td>
<td>The designat...</td>
<td>GeographicalPositionType</td>
</tr>
<tr>
<td>AerodromeReferenceType</td>
<td>name</td>
<td>The primary ...</td>
<td>AerodromeNameType</td>
</tr>
<tr>
<td>AerodromeReferenceType</td>
<td>locationIndicator</td>
<td>A four-letter...</td>
<td>LocationIndicatorType</td>
</tr>
<tr>
<td>AerodromeReferenceType</td>
<td>iataDesignator</td>
<td>The three le...</td>
<td>IataAerodromeDesignatorType</td>
</tr>
<tr>
<td>AerodromeReferenceType</td>
<td>href</td>
<td>Provides an...</td>
<td>HypertextReferenceType</td>
</tr>
<tr>
<td>AircraftApproachCategoryType</td>
<td>H</td>
<td>Helicopters...</td>
<td>enum value</td>
</tr>
<tr>
<td>AircraftApproachCategoryType</td>
<td>E</td>
<td>307 km/h (16...</td>
<td>enum value</td>
</tr>
</tbody>
</table>

Showing 1 to 10 of 674 entries
Note: The future PANS-IM SWIM requirements are expected to include requirements on the semantic alignment to the AIRM for information service payloads. Therefore, fulfilling the requirements from the ECTL specification ensures that anticipated PANS-IM requirements on information are satisfied.

From FIXM Core
- Preservation of meaning
- Connecting data

From AIRM
Note: The future PANS-IM SWIM requirements are expected to include requirements for publicizing Service Overviews, whose content can be derived from service descriptions. Therefore, fulfilling the requirements from the ECTL specification ensures that anticipated PANS-IM requirements on service overview are satisfied.

Requirements for describing what a service does', 'how a service works', 'how to access a service', and other information for consuming a service.
Note: The future PANS-IM SWIM requirements are expected to include a reference to the EUROCONTROL Specification on SWIM Technical Infrastructure Yellow Profile. Therefore, fulfilling the requirements from the ECTL specification ensures that anticipated PANS-IM requirements on technical infrastructure are satisfied.

Figure 1 – Interface Binding Conformance Overview

Requirements on Interface Bindings to be used
Common Project One

AF 5: SWIM

- Common infrastructure components
- SWIM yellow profile technical infrastructure and specifications
- Aeronautical info. exchange
- Meteorological info. exchange
- Cooperative network info. exchange
- Flight info. exchange

Airport data toolkit

DENOT

Supporting airport operators of the CP1 airports list
Airport data toolkit

DENOT

(Digital Event & NOTAM Origination Tool)

- Manage events and provide Digital NOTAM proposal pre-encoded data
- Manage underlying aeronautical airport data, including the airport mapping aspect;
- Expose data using information services

https://ext.eurocontrol.int/aixm_confluence/display/ADTKIT/Overview
Airport data toolkit
DENOT
(Digital Event & NOTAM Origination Tool)

High-level architecture

https://ext.eurocontrol.int/aixm_confluence/display/ADTKIT/Overview
Airport data toolkit
DENOT
(Digital Event & NOTAM Origination Tool)

High-level architecture

https://ext.eurocontrol.int/aixm_confluence/display/ADTKIT/Overview
Status on SWIM planning & deployment in Europe

Hubert LEPORI
EUROCONTROL NMD/INF/IAC
hubert.lepori@eurocontrol.int

Commission Implementing Regulation (EU) 2021/116 (CP1)

SESAR Deployment Programme (Ed. 2021)
https://www.sesardeploymentmanager.eu/publications/deployment-programme/

EUROCONTROL Specifications on SWIM
- Information Definition
  https://www.eurocontrol.int/publication/eurocontrol-specification-swim-information-definition
- Service Description
  https://www.eurocontrol.int/publication/eurocontrol-specification-swim-service-description-sd
- Technical Infrastructure YP

SWIM factsheet
https://www.eurocontrol.int/publication/system-wide-information-management-swim-factsheet

More information on SWIM at https://reference.swim.aero/

European SWIM Service Registry: https://eur-registry.swim.aero/

EUROCONTROL NM B2B Services
https://www.eurocontrol.int/service/network-manager-business-business-b2b-web-services

AIRM: www.AIRM.aero
FIXM: www.FIXM.aero  AIXM: www.AIXM.aero

©2021 EUROCONTROL
ATIEC 2021