





Regulatory framework

COMMON PROJECT

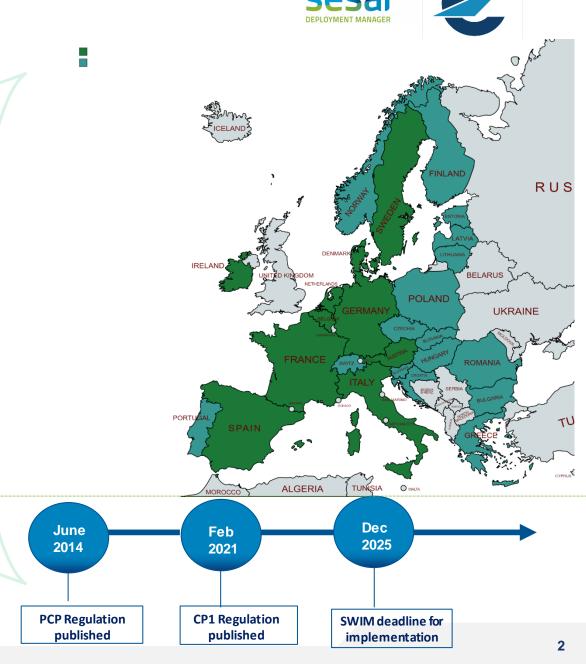




Vision for EU Digital Framework for SESAR
Sky Deployment

Workplan for CP1 Deployment

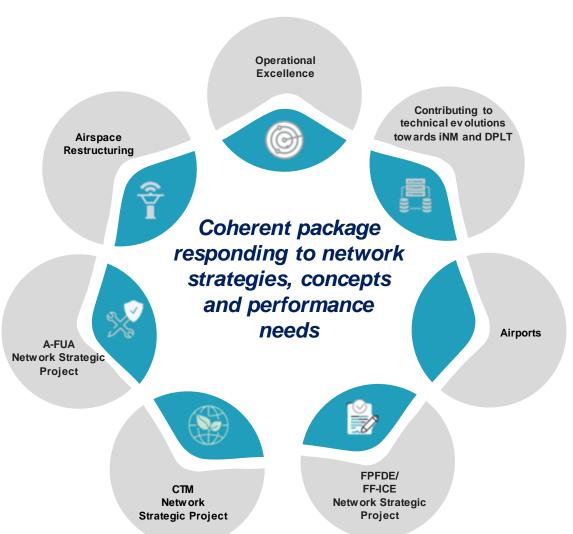
Developed and consulted by all stakeholders



Consolidating Technical and Operational Evolutions







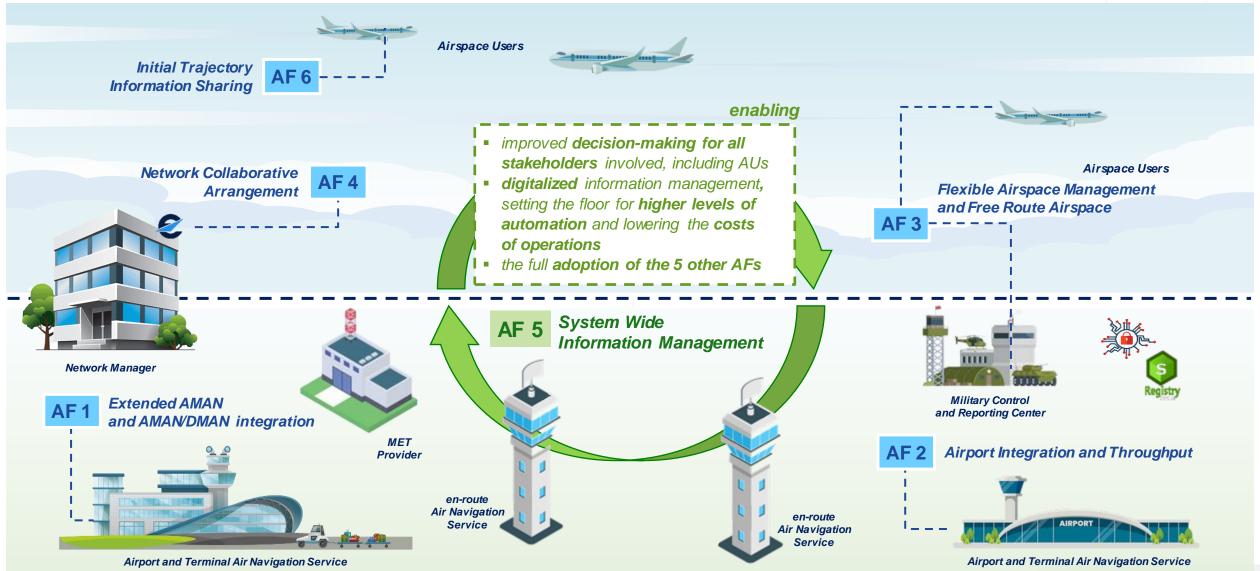


AF5-SWIM

Overview of the ATM functionality

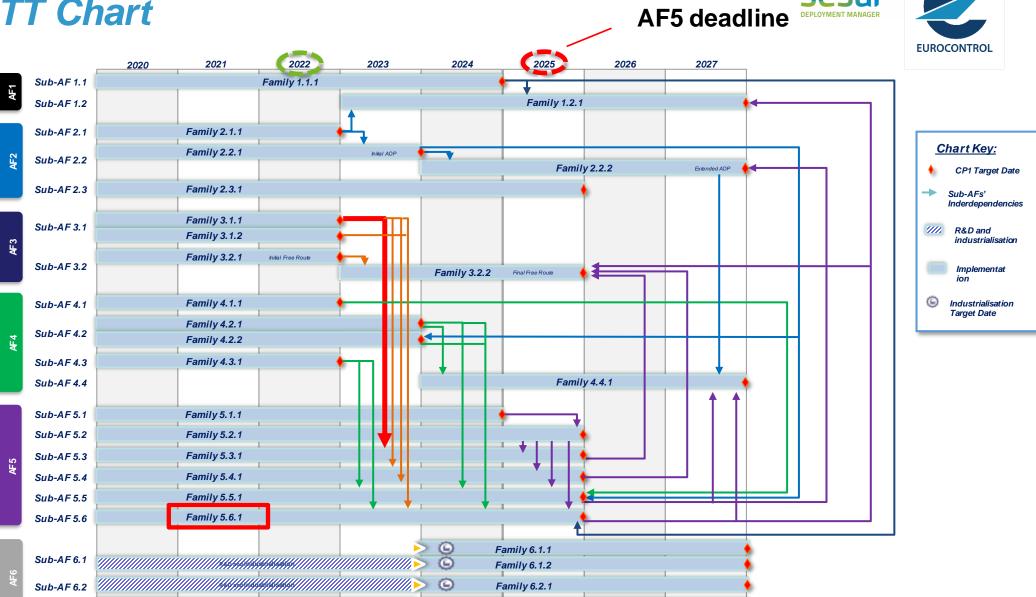






CP1 GANTT Chart

Sub-AF 6.3



Family 6.3.1

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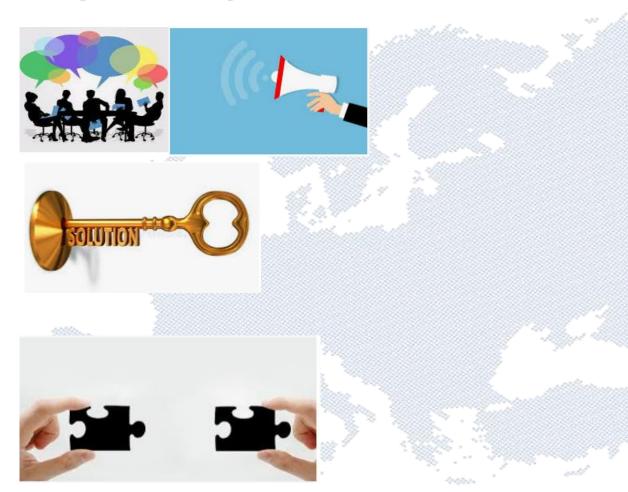






The answer is - **Trajectory Based Operations**

- Discussed and Promoted for Years
- Envisaged as a solution to many of todays limitations
- ➤ Global concept = Global Benefits
 - Collabrative decision making (CDM)
 - More accurate view of Trajectory
 - Common view of trajectory of Flight
- > CP1 incl. SWIM & FF-ICE Release 1 is an enabler for TBO and the baseline for the full Deployment of TBO
- CONOPS under development between NM/SM/SJU



CP1 Mapping FF-ICE R1 Services





CP1	Service	
Flight plan and routes generation and validation	Filling Service, Trial Service (FF-ICE/R1)	
Flight plans, 4D trajectory	Filling Service, Data Publication Service (FF-ICE/R1)	
Flight performance data	Filling Service (FF-ICE/R1)	
Flight status	Notification service (departure and arrival events) (FF-ICE/R1)	
Flights lists	Data Publication Service (FF-ICE/R1)	
Detailed flight data	Flight Data Request Service (FF-ICE/R1)	
Flight update departure information ⁴²	Departure Planning Information Service (A-CDM)	
Flight update messages (FUM) ⁴³	Flight Update Publication Service (A-CDM)	

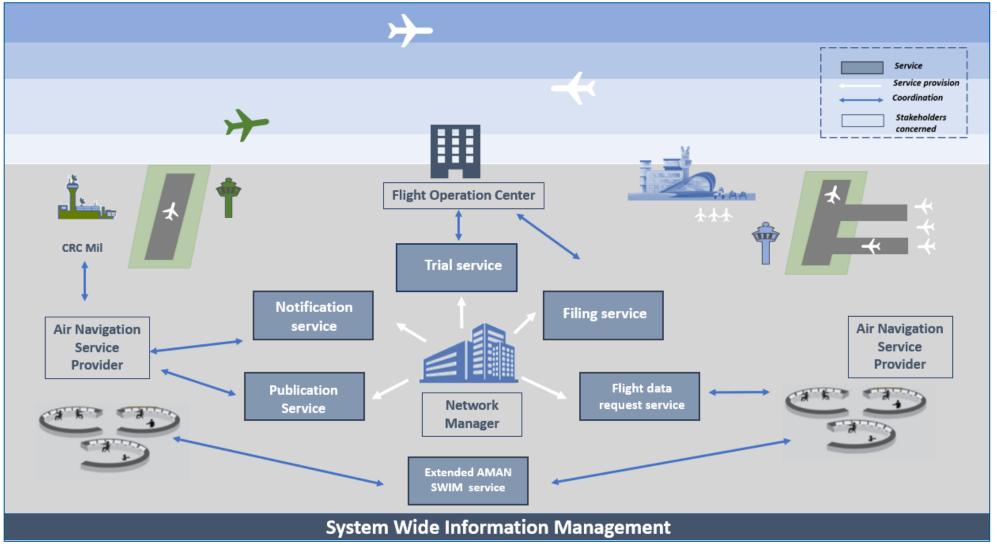
NM Systems Ready



Family 5.6.1 – Flight Information Exchanges











Service	Service Provider	Service Consumer
Filling Service	NM	AU
Flight Data Request Service	NM	ANSP
Notification Service	NM	ANSP
Publication Service	NM	ANSP
Trial Service	NM	AU (Recommended)











Use information



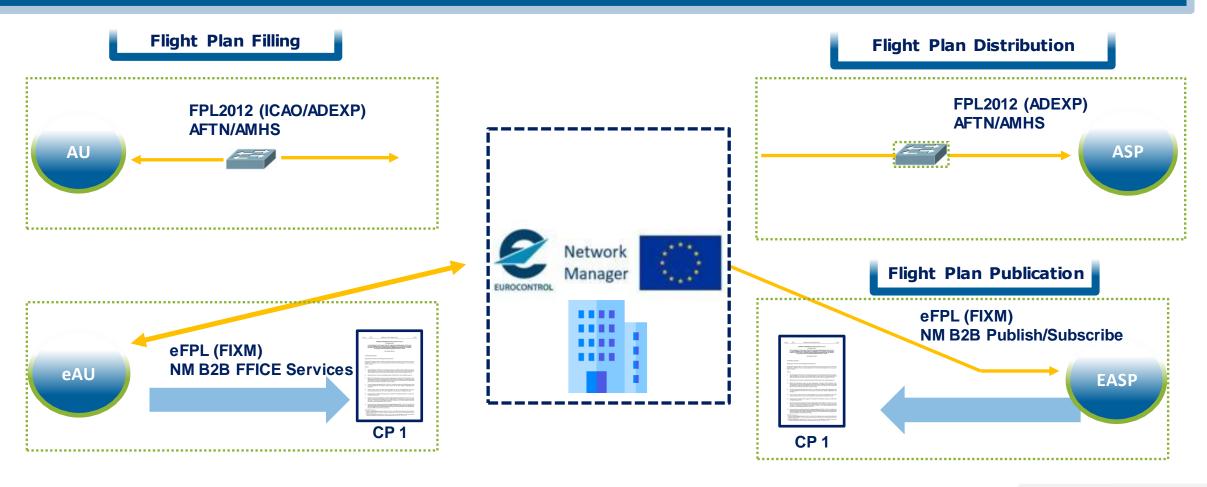
How it will work?





Implements FF-ICE, while still supporting FPL2012 over AFTN/AMHS.

Translation of FF-ICE FPLs to FPL2012 and distribution via AFTN/AMHS to non-migrated ASPs.



FF-ICE impacting stakeholders systems





Where is FPL2012 **Strategic Pre-Tactical and Tactical** data used_ **Execution Post-Ops Stakeholders** today? **Planning Planning** Filling Service Trial Service All Services are exchanged via SWIM **not AFTN Not AMHS** Flight data request Service or other legacy AUs protocol Publication Service Notification Service Operational ATC system (FDP) **Impacted** Flight Planning systems **Systems:** Could be Operational AIS Systems several Flow Systems





A transition from FPL2012 to eFPL. A much greater change than FPL2012 transition!

FPL2012 transition

- No basic FPL Format change
- Main Changes were to field content
- Additional fields in some cases
- Same exchange mechanism AFTN/AMHS
- Translation to legacy format took place for many years after

eFPL transition



- New FPL Format
- New content

Performance data

New Exchange Mechanism - SWIM

FDP impact

- FDP have to use the FF-ICE (eFPL) trajectory data to improve your trajectory fidelity/precision
- FDP have to use the flight specific performance data, including predicted climb and descent profiles for a specific flight contained within an eFPL as part pf FF-ICE R1
- FDP have to use the additional eFPL data provided on trajectory points (point properties, TOC, TOD, etc.)?.

PCP and AU mandate

PCP Regulation No. 716/2014



Official Journal of the European Union

L 190/19

COMMISSION IMPLEMENTING REGULATION (EU) No 716/2014

of 27 June 2014

on the establishment of the Pilot Common Project supporting the implementation of the European Air Traffic Management Master Plan

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the single European sky (¹), and in particular Article 15a(3) thereof,

Whereas:

- (1) The Single European Sky Air Traffic Management Research and Development (SESAR) protect aims to modernies air traffic management (hereinfatre "ATM) in largoe and represents the technological pillar of the Single Lincopean Sky, it aims to provide the Union by 2010 with a high performing air traffic management infrastructure that will enable the safe and environmentally frendly operation and development of air transport.
- (2) Commission Implementing Regulation (EU) No 409/2013 (r) laid down the requirements related to the content of common projects, their setup, adoption, implementation and monitoring, it provides that common projects are required to be implemented on the basis of the deployment programme through implementation projects coordinated by the deployment manager.
- (3) According to Implementing Regulation (EU) No 409/2013, a common project aims to deploy in a timely, coordinated and synchronised way ATM functionalities that are nature for implementation and that contribute to the achievement of the essential operational changes identified in the impropean ATM Muster Plan. Only ATM functionalities requiring synchronised deployment and contributing significantly to Union-wide performance targets are to be included in a common project.
- (4) On a request of the Commission, the SESAR Joint Undertaking prepared a preliminary draft for the first common project, referred to as the 'Pilot Common Project'.
- (5) That preliminary draft was analysed and reviewed by the Commission, with the assistance of European Air Safety Agency, the European Defence Agency, the Network Manager, the Performance Review Body, Eurocontrol, the European Standardisation Organisations and the European Organisation for Civil Aviation Equipment (Eurocae).
- (6) The Commission subsequently carried out an independent global cost-benefit analysis and appropriate consultations with Member States and relevant stakeholders.
- (7) On that basis, the Commission established a proposal for the Pilot Common Project. In accordance with Implementing Regulation (EU) No 409/2013: the SESAR civil airspace users' group endorsed the proposal on 30 April 2014; the air navigation service providers endorsed the proposal on 30 April 2014; the majorat operators endorsed the proposal on 25 April 2014; and the European Astional Meteorological Services endorsed the proposal on 30 April 2014; and the European Astional Meteorological Services endorsed the proposal on 30 April 2014.
- (8) The Pilot Common Project identifies six ATM functionalities, namely Extended Arrival Management and Performance Based Navigation in the High Density Terminal Manoeuvring Areas, Airport Integration and Throughput, Health eAltpace Amangement and Fere Router Network Collaborative Management; intil System Wide Information Management; and Initial Trajectory Information Sharing. The deployment of those six ATM functionalities should be made amandatory.



System requirements

- Network Manager systems shall deal with flexible airspace structures, route configuration allowing the management of traffic loads and complexity in a collaborative manner at flow management position and network level
- The flight data processing systems shall interface with the NOP.
- Flight planning systems shall support EFPL and Network Manager systems shall be able to process EFPL
- Information provided through Route Availability Document (RAD) and Profile Tuning Restriction (PTR) shall be harmonised through the Collaborative Decision Making (CDM) process of the European Route Network Design and ATFM functions of the Network Manager such that Flight Planning System Providers shall be able to generate a flight plan routing that will be accepted with the most efficient trajectory
- ASM/ATFCM tools shall be able to manage different airspace availability and sector capacity, including A-FUA
 (as specified in point (3), Route Availability Document (RAD) adaptation and STAM

Deadline 2022

PCP update – CP1

CP1 Regulation No. 2021/116





AF4

36/10

EN

Official Journal of the European Union

2.2.2021

COMMISSION IMPLEMENTING REGULATION (EU) 2021/116

of 1 February 2021

on the establishment of the Common Project One supporting the implementation of the European Air Traffic Management Master Plan provided for in Regulation (EC) No 550/2004 of the European Parliament and of the Council, amending Commission Implementing Regulation (EU) No 409/2013 and repealing Commission Implementing Regulation (EU) No 716/2014

(Text with EEA relevance)

THE EUROPEAN COMMISSION,

Having regard to the Treaty on the Functioning of the European Union,

Having regard to Regulation (EC) No 550/2004 of the European Parliament and of the Council of 10 March 2004 on the provision of air navigation services in the single European sky (the service provision Regulation) (*), and in particular Article 15a thereof,

Whereas

- (1) The Single European Sky (SES) aims at modernising the European air traffic management (ATM) by improving its safety and efficiency. It contributes to the reduction of greenhouse gas emissions. The Single European Sky Air Traffic Management Research and Development (SESAR) project constitutes the technological pillar of the SES.
- (2) Modernisation should be steered to achieving the European ATM Master plan's vision of a digital European sky.
- (3) Effective ATM modernication requires the timely implementation of innovative ATM functionalities. Those inturnities should be based on technologies that increase the levels of automation, cyber-secure data sharing, and connectivity in ATM. Those technologies should also increase the levels of virtualisation of the European ATM infrastructure and at traffic service provision in all twoss of aircrase.
- (4) Commission Implementing Regulation (EU) No 409/2013 (*) establishes a framework for SESAR deployment setting out the requirements for the content of common projects, for their setup, adoption, implementation and monitorine.
- (5) Common projects should only include ATM functionalities that are ready for implementation, that require synchronised implementation and that contribute significantly to achieving Union-wide performance targets.
- (6) Common projects are implemented through projects coordinated by the deployment manager in accordance with the deployment programme.
- (7) The Plot Common Project established by Commission Implementing Regulation (II). No 716/2014 (9 was a plut initiative to implement AIM functionalities based on ESSAR solutions in a coordinated and synchronised manner and served as a testbed for the governance and incentive mechanisms of the SESAR deployment framework established in implementing Regulation (EII) No 409/2013.
- (8) A review carried out in accordance with Article 6 of Implementing Regulation (EU) No.716/E014 concluded that the Plot Common Project achieved positive operational changes in the Interopera ATM. However, the wartable level of maturity for implementation of ATM functionalities and its impact on the synchronisation of their implementation reduced the effectiveness of the Plot Common Position.

System requirements

- (a) Network Manager systems must:
 - deal with flexible airspace structures and route configuration allowing the management of traffic loads and complexity in a collaborative manner at the flow management position and at network level;
 - be able to provide FF-ICE Release 1 filing services;
 - support the scenario management for ATFCM planning activities in order to optimise the network capacity.
- (b) The flight data processing systems must interface with the NOP.
- (c) The information provided through route availability document ('RAD') and profile tuning restriction (PTR) must be harmonised through the collaborative decision making (CDM) process of the European route network design and ATFM functions of the Network Manager so that flight planning system providers are able to generate a flight plan routing that will be accepted with the most efficient trajectory.
- (d) Airspace users' and ANSP's systems must support the exchange of FF-ICE Release 1 filing services, once available as set out in AF 5.1.6.
- (e) ASM/ATFCM tools must be able to manage different airspace availability and sector capacity including A-FUA as set out in AF3, RAD adaptation and STAM.



AF4 Deadline 31 dec 2022 but AUs FF-ICE deadline pushed to AF5







AF5

General

Operational stakeholders must implement services that support the exchange of flight information using the SWIM yellow profile, as specified in the deployment programme:

- (a) related to FF-ICE Release 1 Services:
 - flight plan and routes generation and validation;
 - flight plans, 4D trajectory, flight performance data, flight status;
 - flights lists and detailed flight data;
- (b) related to flight update departure information;
- (c) flight update messages ('FUM') (Network Manager Business to Business (B2B) service).

System requirements

- (a) The implementation of the services referred to in point 5.1.6 must comply with applicable SWIM specifications.
- (b) ATM systems operated by stakeholders referred to in point 5.3 must enable the use of the flight information exchange services.

Deadline 31 dec 2025

SESAR Deployment Programme Family 5.6.1



System Requirements

This service implements:

 FF-ICE flight plan (eFPL, including updates and cancellations) submission to the Network Manager that includes information such as 4D trajectory information, flight specific performance data and the Global Unique Flight Identifier (GUFI)

Filling service

- Feedback provision (validation and filing status) to eFPL originators
- The operational stakeholders shall use NM B2B Services supporting the information Exchange of FF-ICE



AU Milestones

Consume the NM FF-ICE/R1 Filing Service

DM1

The AU system is upgraded to be able to use the NM FF-ICE/R1 Filing Service for the submission of eFPLs and any updates to NM.

Milestones achievement conditions:

The AU system consumes the NM FF-ICE/R1 Filing Service

Operational use

DM2

The system is used to support daily operation once the systems have been implemented, the procedures are in place capability assessment hast been delivered, and the training has been completed

Milestones achievement conditions:

The AY system uses the NM FF-ICE/R1 Filing Service

AU Must

Consume the Filing Service using the NM B2B services in support of information Exchange of FF-ICE

Geographical Scope



SWIM Services must be deployed in the EATMN



Definition 17 of the (EU) 549/2004

European air traffic management network' (EATMN) means the collection of systems listed in Annex I to Regulation (EC) No 552/2004 of the European Parliament and of the Council of 10 March 2004 on the interoperability of the European air traffic management network (the interoperability Regulation) enabling air navigation services in the Community to be provided, including the interfaces at boundaries with third countries

Mandated stakeholders

- ✓ ANSPs
- ✓ Air space users
- (Indirectly manufacturing Industry)

Mandated AUs are globally

All AUs operating in the EATMN Airspace are mandated by this regulation to fulfil the obligations explained above and file eFPL the latest 31st Dec 2025. This understanding of the implementation requirement has been clarified and agreed with the European Commission in a bilateral meeting EC-SDM October 6th 2022

<u>CP1 deadline is 31 December 2025</u>, status of implementation to be reported in SDM monitoring exercise.

Status of European deployment of FF-ICE Release 1





Network Manager



- ✓ Provider of all services
- √ All Services are implemented
- All services available in the SWIM registry

Airspace Users



- √ Consumer of Filling service and trial service
- √ Testing activities ongoing
- √ Implementation projects ongoing
- √ No report of implementation
- ✓ No reports from AUs on status nor plans.
- ✓ Expected start og eFPL filling 2023 from some AUs

Air Navigation Service Providers



- ✓ Consumer of Publication Service, Data request and Notification service
- ✓ Testing activities ongoing
- √ Nothing reported as implemented
- √ 7% of milestones reported as ongoing
- √ 29% reported as planned
- ✓ None is reporting depployment later than 31/12-2025

AF5-SWIM

The contribution of CEF Call 2022 to push forward SWIM deployment







- 21 stakeholders from all Europe (ANSPs, AISPs, Airports, NM)
- Enabling the exchange of digital and harmonized aeronautical information
- A critical step towards a common Aeronautical Information Management for the whole Network
- Aerodrome Mapping Information, Aeronautical Information, Digital NOTAMs
 - Seamless information access and interchanges among all stakeholders

- 15 stakeholders from all Europe (ANSPs, NM, MILs)
- Airspace information (structure, availability, etc.) and Airspace
 Reservation digitally available to all stakeholders, also beyond borders
- Safety and capacity of airspace increase, and enable optimal trajectories for airspace users
 - Harmonized Airspace
 Management across the Network

- 8 major stakeholders involved (ANSPs, MILs, NM, AUs)
- Air France and KLM as first movers, following Lufthansa's example
- Allowing AUs to submit their electronic
 Flight Plans, NM to process it and ANSPs
 to use such info
- Cutting delays and overloads, increasing capacity and ATCO productivity
- A critical milestone to power TBO, moving towards further automation

AF5 - SWIM

Next steps, challenges and opportunities





The upcoming priority for a timely SWIM adoption in Europe is the wide-spread implementation of FF-ICE.

Ground and airborne stakeholders looking for support on this thread can count on SDM support: the target is to

submit an EU-wide implementation project in the CEF Call 2023 to gain access to up to 50% funding support



CP1 mandates all Airspace Users operating in the European airspace – including overflights – to adopt FF-ICE: SDM will work to create awareness on such mandate, whilst at the same time ensuring – along with the other stakeholders – data coming from new eFPL gets effectively used on the ground



SWIM will require a **business transformation** among many **ATM stakeholders**, opening the door to the **digital evolution** of ATM operations, tools and services across the industry

FF-ICE R1 Implementation Common EUROCONTROL NM/SDM FF-ICE Implementation Support Initiative





To be discussed at an ad-hoc Joint NDOP/NDTECH Meeting – 1 March 2023

Aimed at ensuring continuous implementation support and monitoring for timely implementation

Targeting all operational stakeholders

Ensuring timely readiness of operational stakeholders systems to enable sufficient time for testing with NM systems

Agreeing on a common notification to support the means of promulgating the information concerning the implementation of FF-ICE at national level to the benefit of the international civil aviation community

Making the point on the level of readiness





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