



NETWORK
MANAGER



European FF-ICE/R1 Implementation roadmap (Edition 2, 2025)



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1. Introduction

1.1. Scope & content of the document

This document consists of the FF-ICE/R1 Implementation Roadmap, second edition, as referred in the Work-Package 3 of the PMP (NM/SDM-FF-ICE/R1-PMP-v1.0) of the NM-SDM Initiative. The first version of the roadmap was published spring 2024.

It provides a best-as-possible consolidated view of the current planning of the implementation of FF-ICE/R1 across the CP1 mandated Stakeholders based upon the information collected through:

- the Monitoring Exercise 2024, whose data collection is performed through the usage of the EUROCONTROL Local Single Sky ImPlementation (LSSIP+) tool on ground side and with ad-hoc templates for Airspace Users
- bilateral meetings with Stakeholders where possible and necessary
- direct input by NM (as part of the NM / SDM FF-ICE Support Initiative)

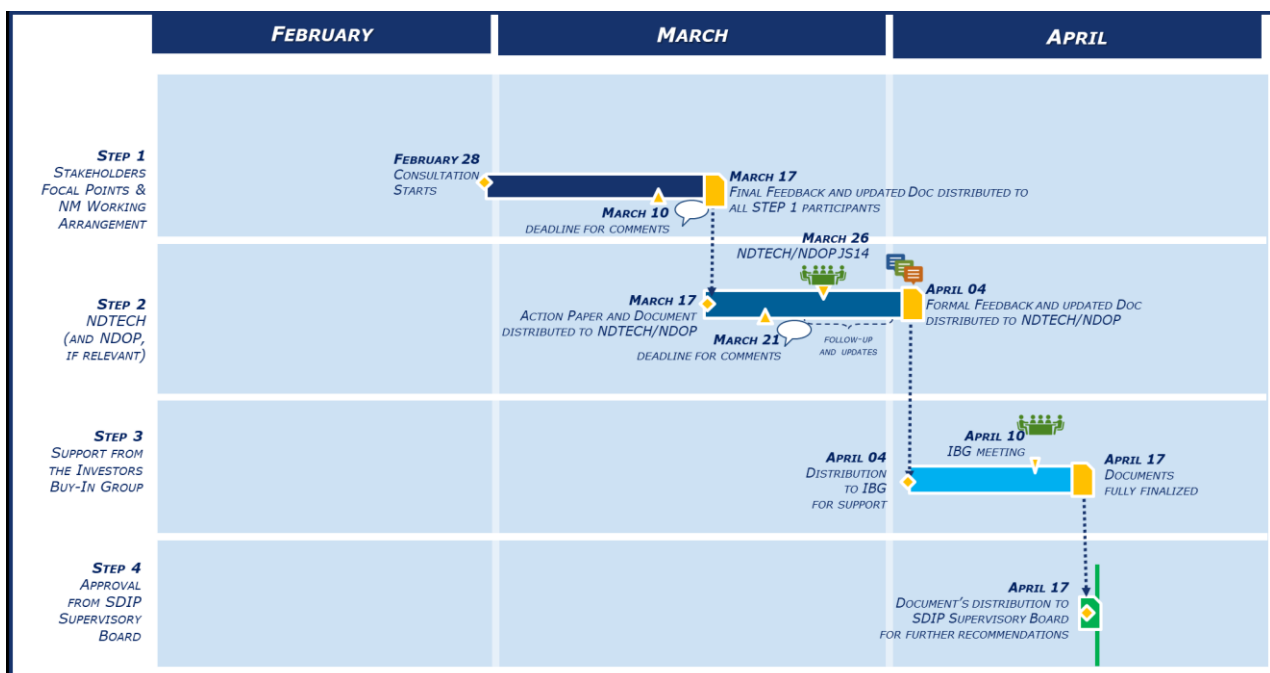
It also provides a consolidated analysis of the planning situation, highlighting in particular the main issues hinting towards the implementation, the assessed risks and actions envisaged to address those issues and risks.

Further to this consolidated view and analysis, the Annex of the document provides further details regarding the information reported by each ANSP in the framework of the SDP Monitoring Exercise 2024.

1.2. Intended audience and review

The FF-ICE/R1 implementation roadmap serves as a document to communicate the progress of the overall implementation of FF-ICE / R1 on a regular basis to all impacted Stakeholders for information and any steering of the NM/SDM FF-ICE initiative.

The current document is the second version of the FF-ICE/R1 Implementation Roadmap. It is provided for review to the SDM Stakeholders through the Stakeholders Consultation Process which also includes an NDOP / NDTECH review in accordance with the following planning.



2. CP1 FF-ICE / R1 requirements

This section provides an overview of the CP1 FF-ICE/R1 requirements documents that serve as the baseline for the Stakeholders to develop their own implementation requirements and related implementation plans as reported in this document.

All referred documents are available on the Website of the SESAR Deployment Manager.

2.1. CP1 and the SESAR Deployment Programme

Regulation (EU) 2021/116 (also referred as CP1) lays down a set of six ATM functionalities (AFs) to be implemented across the European ATM Network up to 2027. CP1 AFs are also divided into 20 sub-ATM functionalities (sub-AFs), which are integral parts of AFs and contribute to their respective scope.

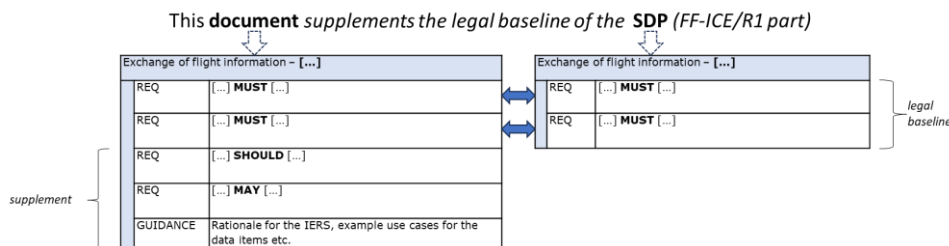
CP1 / SDP - Sub AF 5.6 (Flight Information Exchange), part of the AF5 Family SWIM, mandates that the FF-ICE/R1 Filing, Trial, Data Publication, Flight Data Request and Notification Services are provided by the Network Manager (NM) and consumed by Airspace Users (or their designated representatives) -for the Filing Service- and Air Navigation Service Providers' (ANSPs) Systems -for the Data Publication, Flight Data Request, Notification Services, Filing Services as depending on the System concerning- by December 31, 2025.

The SESAR Deployment Programme provides a common workplan to all operational stakeholders involved in the deployment of Regulation (EU) n. 2021/116, so called Common Project One (CP1), clearly defining the scope of the implementation activities (in terms of technical and operational requirements), the synchronisation needs, as well as the suggested deployment approach (through defining implementation milestones per each different category of implementing Stakeholders) per each Sub AF.

2.2. Information Exchange requirements

SDM, in collaboration with NM, has developed requirements complementing the current system requirements from the SDP. They provide details and clarity about the FF-ICE/R1 Information Exchange Requirements (IERs) to be satisfied by mandated stakeholders. The IERs outlined herein serve as a cornerstone for harmonizing operations, fostering collaboration, and ensuring compliance with the regulatory imperatives set forth in CP1.

The Information Exchange Requirements complement the legal baseline of the SESAR deployment program (SDP) 2024, specifically addressing the details of implementing CP1 FF-ICE/R1 information exchanges. The FF-ICE/R1 IERs define for each service the information data that are mandatory ("must"), the information data that are recommended to maximise the benefits of the FF-ICE/R1 implementation in Europe from the SDP ("should") or that are optional / nice to have ("may").



2.3. FF-ICE/R1 Ground Use cases

CP1 mandates a harmonised implementation of FF-ICE/R1, moving to a new exchange mechanism (SWIM Yellow Profile) and the usage of the new information contained in the eFPL in the many ground systems. FF-ICE/R1 is impacting all stakeholders in ATM globally but it is only mandated to the stakeholders in CP1. The NM / SDM FF-ICE initiative has developed, in cooperation with impacted operational Stakeholders, a use case document describing different potential usage of this new information in the ground systems. The use cases document will be referred as part of the SDP Guidance material and is available on the SDM website.

The objectives of the FF-ICE/R1 use case document are to:

- Provide a set of flight planning use cases that enable the production and distribution of FF-ICE flight plans (eFPLs) by using the Network Manager B2B (NM B2B) FF-ICE/R1 services as mandated by CP1 and the SESAR Deployment Programme.
- Provide a set of use cases to enable the use and consumption of FF-ICE/R1 information data by ANSPs as mandated by CP1 and the SESAR Deployment Programme. The use cases described in the document are not mandatory but guidance material to support own use case elaboration. It is however mandated that ANSPs make use of the new data in their ground systems especially their Flight data processing system.

The use cases described are not exhaustive but encompass some common views on the essential implementation of FF-ICE/R1. Additional use cases may be required and developed directly by Operational Stakeholders to address other operational usages of eFPL information in their ground systems and related operational processes.

3. Reported Implementation roadmap: Analysis per category of Stakeholders / per category of Systems

3.1. States' AIC

Before operating in the airspace of any EU Member State (and Norway/Switzerland), airspace users need to ensure they comply with local laws. While the CP1 regulation may not be read or even be known by airspace users beyond Europe, there are mechanisms to facilitate the communication of such important operational changes.

As it has been done in the past for topics such as Reduced Vertical Separation Minima (RVSM), Radio frequency change (8,33kHz), Basic Air Navigation (B-RNAV), Data Link Service (DLS), an aeronautical information circular (AIC) stating the new rules for flight plan filing should be accessible to the whole community of airspace users.

The publication of such an AIC will ensure awareness of local requirements in individual states. This publication would serve to:

- raise awareness globally among EU and non-EU airspace users about the obligation to transition to the new flight plan format by no later than 31 December 2025;
- ensure early State involvement in the transition from the existing (FPL2012) to the new flight plan format (eFPL);
- initiate the national process of planning the full transition to eFPL for all traffic, considering that initially only IFR is mandated, but all traffic will be impacted in the longer term with a confirmed global FPL2012 sunset date of 2034 agreed at Air Navigation Conference 14 in 2024 (AN-CONF/14);
- ensure national coordination among all stakeholders affected by this transition to a new flight plan format, even those not mandated by the regulation.

During the last year, the NM / SDM Support Initiative has promoted the publication of AICs by States in different fora (i.e. the 88th Single Sky Committee in June 2024, the NSA Coordination Platform meetings, the NDOP/NDTECH meetings) with advising to publish such an AIC as soon as possible and proposing a draft AIC specimen.

A formal action related to AIC publication has been identified as part of NDOP/NDTECH and reporting of AIC publication is thereby required. The following figure of the status of the AIC publication has been developed using both NDOP/NDTECH reporting and answers received to LSSIP+ tool AROs questionnaire.

AIC Publication status

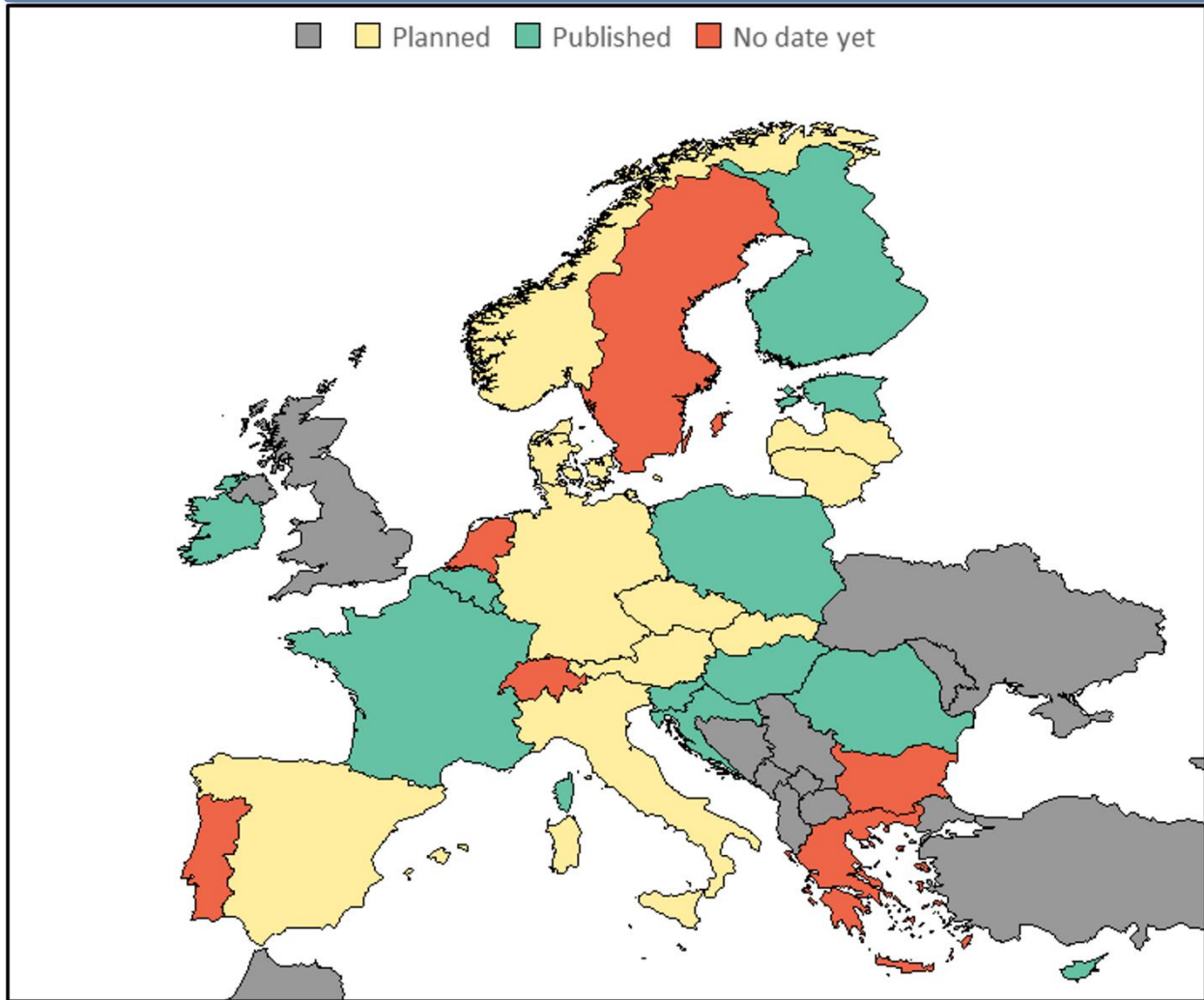


Figure 1 States' AIC Publication Status

3.2. NM FF-ICE/R1 B2B implementation and validation Planning

The Network Manager (NM) had already performed its implementation quite in advance of the mandated deadline and is providing NM FF-ICE/R1 B2B services (Filing, Trial, Notification, Flight data request, Publication) for their use either by AUs/CFSPs or by ANSPs.

Besides this implementation, NM is also affected by the other Operational Stakeholders' implementation and their usage of the NM FF-ICE/R1 B2B provided services. NM has put in place a validation process leading to their operational usage.

As outlined in the *Operational Deployment of the NM B2B Services*, every client application of the B2B API needs to be validated before being allowed to connect to the OPS environment. This process has been EASA approved and rigorously followed since 2016.

To start with, the implementing stakeholder must request and obtain a NM B2B PREOPS certificate (or update the existing one with the correct profile) for the access and use of the identified services in the NM PREOPS platform so that they can process with their technical testing as much as needed. Further on, there is a process implemented by NM to ensure an appropriate "operational validation" takes place before obtaining an OPS certificate allowing access these services in the NM OPS environment.

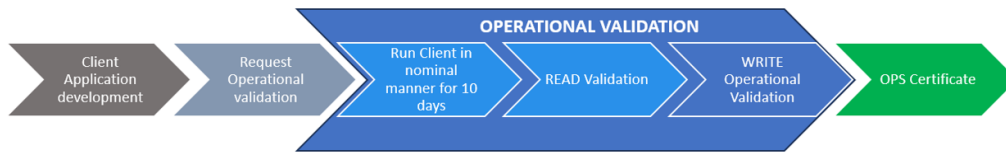


Figure 2 NM B2B Validation process

- **READ Validation:** A READ validation will be required for every Operational Validation. A testing period of 10 days is required where the user shall run the client application in nominal manner (as intended to be used in OPS). Once customer informs NM B2B that 10 days testing period is finished, validation analysis will start. The outcome of the validation will be communicated to the customer as soon as available.

Note that the 10-day rule was initially set as an arbitrary / nominal timeframe to ensure the following:

- Sufficient data consumption
- A period of the usage of the B2B services long enough to prevent any single day's anomalies (e.g., temporary service unavailability) from skewing results
- Adequate time to test all use cases under varying conditions

With the recent introduction of monitoring tools, our Technical Operational Validations have become more precise.

As a result, we may now consider reducing the Technical Operational Validation period, provided there is sufficient usage and, most importantly, that the Customer Organization thoroughly tests all their interactions.

If these 2 aspects are satisfied, NM and Customer Organisation could agree on the reduced time for the Technical Operational Validation.

- **WRITE Validation:** A WRITE validation will be required in case the client application intends to use of any WRITE service. The WRITE validation is organised as a session (in case of WRITE validation there is no usage monitoring during several days period). Duration of the WRITE Operational Validation session depend on the extent of the Use Cases and type of validated services. In general, the approximate duration of the Operational Validation is between 1h and 2h per validated service.

Every new user will be required to pass an Operational Validation in order to get NM B2B OPS certificate. Having an OPS certificate for other B2B services does not exclude the need to go through this process for FF-ICE/R1 services. Expected duration of the entire process until obtaining the OPS certificate is around 3 months.

The actual duration will depend on the circumstances (failed validation sessions, timely provided Use Cases, etc.)

The following table provides an overview of the number of PREOPS certificates and OPS certificates regarding NM B2B FF-ICE/R1 services delivered and registered (whether over internet or NewPens) as of Dec 2024.

	PRE-OPS certificates In use		OPS certificates In use	
	Internet	NewPENS	Internet	NewPens
Industry & R&D	32	0	2	0
ANSP	17	3	2	0
Airspace User	12	0	5	0

Government Body	3	0	0	0
Airport Operator	2	0	0	0

Figure 3 Number of PRE-OPS and OPS certificates registered

Once it has obtained an OPS certificate, the corresponding Operational Stakeholder may use the related NM FF-ICE/R1 B2B services on the NM OPS platform.

The fact that an Operational Stakeholder has obtained such a certificate does not mean that it has completed its implementation and complied with the CP1 mandate. This compliance will only happen when the Operational Stakeholder uses systematically and correctly the NM FF-ICE/R1 B2B services in its daily operations.

For an AU, that means that all its flight plans (for all IFR/GAT flights (including military GAT)), and any subsequent update, are filed through the NM B2B FF-ICE/R1 filing service (i.e. not using FPL2012 service then) and the information present for any filed flight plan is coherent to the information requirements expressed in the FF-ICE/R1 Information Exchange Requirements published by the SDM. NM will not be in the position to provide any "acceptance certificate" that could guarantee such compliance but is reflecting on developing a post-ops monitoring process that would allow to provide significant information regarding such compliance.

On an ANSP's side, that means that access to flight plan (information) and provision of departure / arrival notifications is systematically performed in conformance to CP1 / SDP requirements using all mandated NM FF-ICE/R1 B2B services, including the fact that the eFPL information is used by ATM systems in coherence with CP1 / SDP requirements.

NM will not be in the position to provide any "acceptance certificate" that could guarantee such compliance but is also reflecting on developing a post-ops monitoring process that would allow to provide significant information regarding such compliance.

Note that, for simplification reasons, in the above description, it was referred to an AU entity. However, the situation is slightly more complicated as many AUs are filing flight plan through a CFSP entity or using a CFSP system. Below is an explanation of the possible "configurations" of AUs / CFSPs relations and the impact on the above-described NM validation process.

1. Airspace Users obtain their own individual certificate with their own Flight plan filing system. A full operational validation will be conducted.
2. Airspace Users utilize the certificate of their CFSP, allowing multiple AUs to operate under the same certification. This requires a declaration of use, an annex to the agreement between the CFSP and B2B listing all of these users. A full operational validation will be conducted for the first AU using the CFSP application and simplified operational validation process for the next AU.
3. CFSP has a certificate and the airline has a certificate. A full operational validation will be conducted for the first AU using the CFSP application and a simplified operational validation process for the next AU.
4. The CFSP has a certificate and the parent airline has the certificate under which the subsidiaries are operating. This requires a declaration of use, an annex to the agreement between the parent airline and B2B NM listing all of these subsidiaries. A full operational validation will be conducted for the parent airline using the CFSP application and a simplified operational validation process for the subsidiaries.

Currently, NM is working actively to coordinate with as many main CFSPs as possible for validation planning dates as feasible, and with AUs when it is clearly identified they belong to the first category above and have already undertaken significant testing with the NM Pre-Ops platform. However, there is not a clear situation which airspace users belong to the configurations 2, 3, 4 and any relevant planning.

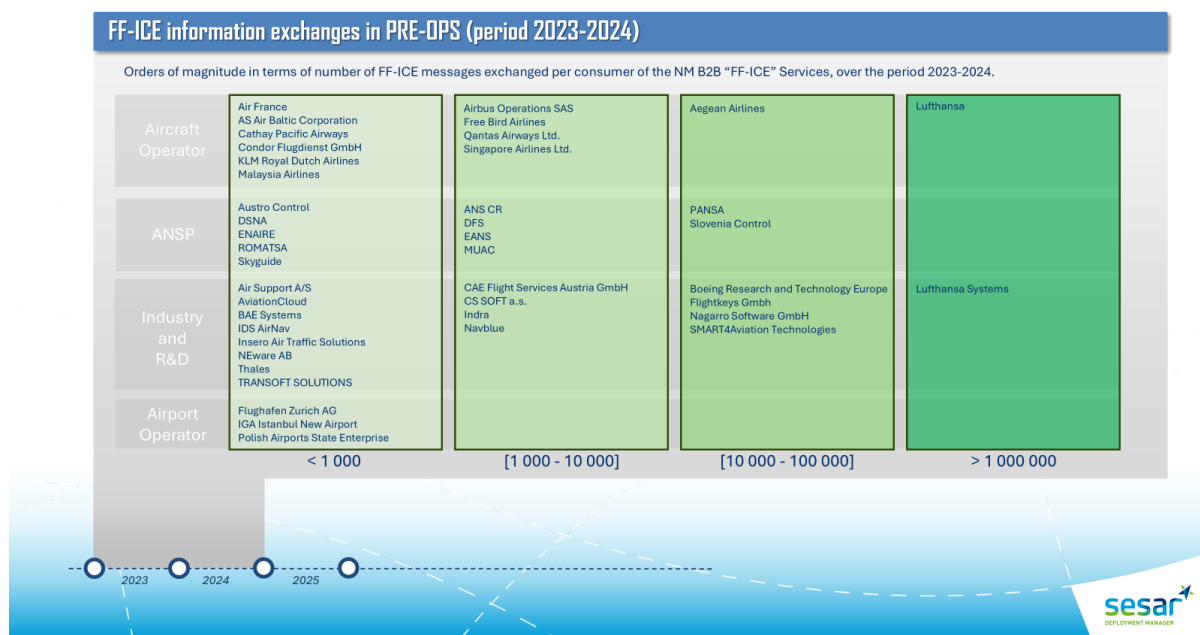
Obviously, considering the current situation (only five OPS certificates), the more and the later validation requests will be processed, the more these will have to be delayed in terms of a NM validation planning.

Finally, as said above, obtaining an OPS certificate is not the end of the journey for Operational Stakeholders. It is necessary to use these services in full compliance with the operational requirements set in CP1 / the SDP and their implementation planning should duly reflect this.

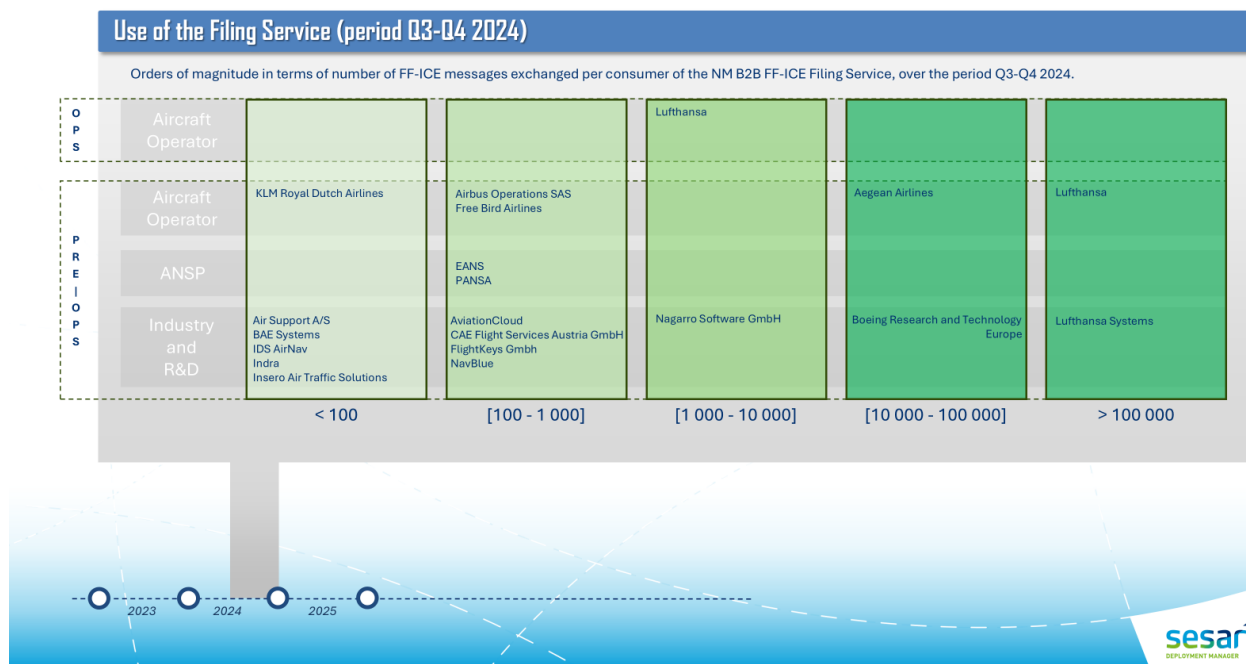
Statistics on FF-ICE/R1 information exchanges in PRE-OPS & OPS (period 2023-2024)

The tables below, based on statistics from the Network Manager, provide:

- the volumes of FF-ICE/R1 messages exchanged per consumer of the NM B2B "FF-ICE/R1" Services, over the period 2023-2024,
- volume of FF-ICE/R1 messages exchanged per consumer of the NM B2B "FF-ICE/R1" Filing Service, both in OPS and PRE-OPS, for the period Q3-Q4 2024.



Note: no entry for the range [100 000 – 1 000 000], which is therefore not displayed on the picture.



These tables reflect the variety of organisations (AUs, CFSPs, ANSPs, ATM Systems manufacturers...) already testing in PRE-OPS.

It is worth noting that Lufthansa & Lufthansa Systems have been the pioneers in terms of consuming FF-ICE/R1 Services (Filing, Trial and Flight Data Request) provided by NM. Lufthansa, using Lufthansa Systems' tools, has already an OPS certificate while it has only filed a very limited number of eFPL in the OPS environment.

An increasing number of CFSPs are testing their eFPL filing capabilities in PREOPS. After they obtain an OPS certificate, we could expect an accelerated roll-out among Airspace Users.

Two ANSPs are consuming the Filing Service in PREOPS, indicating a first ramp-up from an ANSP/ARO perspective.

3.3. AUs

CP1 mandates all Airspace Users operating IFR/GAT or mixed VFR/IFR flights (including military GAT) in the EATMN Airspace to file eFPLs using the FF-ICE/R1 Filing service. VFR, OAT and mixed OAT/GAT are not mandated by CP1.

CP1 also applies to military when they fly IFR/GAT but does NOT apply to OAT.

These requirements then apply indirectly to ATS Reporting Offices (AROs) and Computer Flight plan Service Providers (CFSPs) when filing eFPLs on behalf of Airspace Users.

3.3.1. AUs' implementation plans

Most Airspace Users are aware of their obligations regarding FF-ICE/R1, among others thanks to an SDM AU awareness campaign involving frequent meetings and outreach efforts across various forums. Additionally, long-standing collaboration with the FAA has now been extended to include Canada, further enhancing AUs' awareness in these countries. Engagement in Asia, particularly with Korea and China, has also contributed to this effort, along with ongoing activities in ICAO regional coordination

Airspace users (AUs) are monitored through the SDP Monitoring Exercise via dedicated questionnaires. In Europe, more than 800 different airspace users operate annually, encompassing commercial aviation, general aviation, and military operations. This diversity presents significant challenges for monitoring and implementation efforts. All airspace users operating in Europe are subject to the CP1 regulation, making its impact global.

The figure below shows the individual implementation plans received from Airspace Users through the SDP Monitoring Exercise 2024, managed by the SDM¹.

¹ The Airspace Users were requested to fill in a questionnaire regarding the implementation status of CP1, thus also the implementation status for FF-ICE/R1.

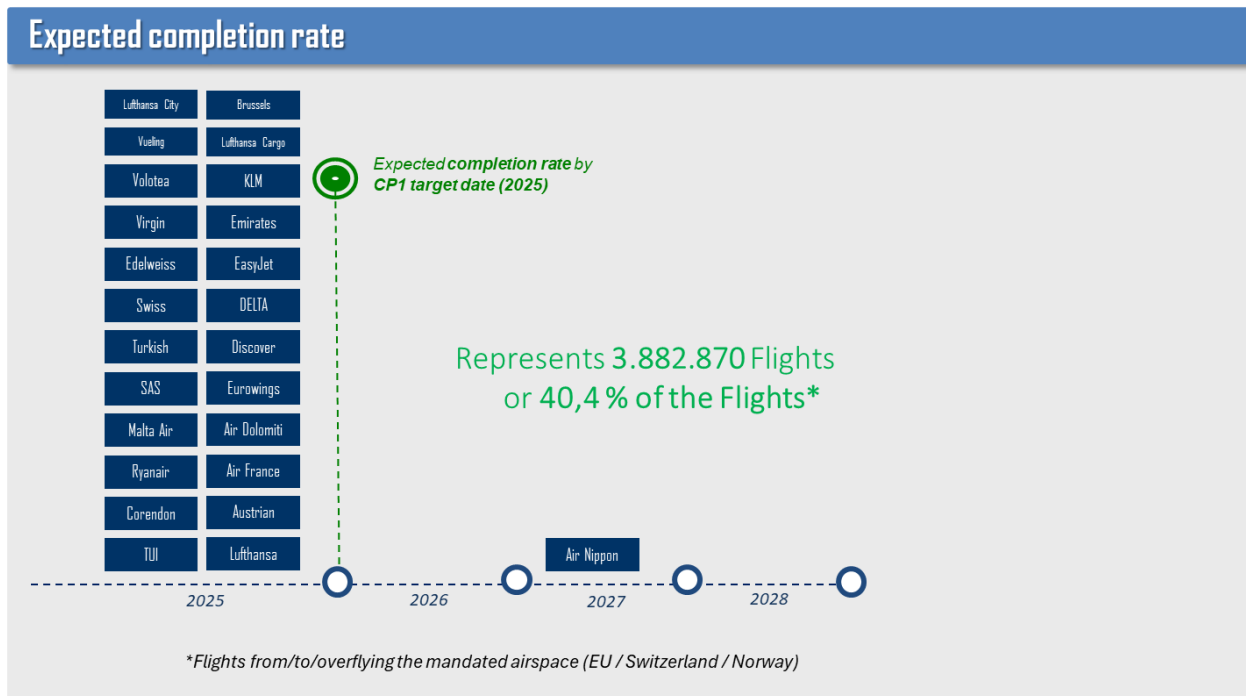


Figure 4 AUs' Implementation planning

3.3.2. AUs' relations with CFSP

Most of commercial AUs are filing flight plan through a CFSP (Computerised Flight plan Service Provider) entity or using a system developed and provided by a CFSP. In many cases the systems and services are tailored according to the AUs' individual needs and the usage of these systems vary. The way a CFSP will provide a service and/or system to an AU and how it is operated will impact the testing with NM and delivery of Ops Certificates by NM (please see 3.2 NM FF-ICE/R1 B2B implementation and validation Planning).

There are a limited number of CFSPs with customers in Europe. At least seven of those are connected with NM PreOps and using the FF-ICE Filing Service / testing their systems.

Lufthansa Systems: Lufthansa Systems is the largest player in Europe, serving customers that collectively account for over 50% of European air traffic. The company has been actively involved in FF-ICE since its early days in SESAR R&D and now offers advanced systems that fully meet the capabilities required in CP1. Its customer base includes industry leaders such as Lufthansa Group, KLM/Air France, EasyJet, and Ryanair. Currently, Lufthansa Systems files over 100,000 eFPLs in PreOps annually, underscoring its market dominance and technological expertise.

BAE Systems: Is primarily utilized by military and defense organizations. For instance, the U.S. Air Force employs the Mobility Air Forces Automated Flight Planning Service (MAFPS) to generate optimized, fuel-efficient flight plans for tankers, cargo, and operational support aircraft. They have progressively started testing in NM preOps. They have been triggered through the SDM AU awareness process that included meetings with US military.

CAE: CAE Flight Plan Filing is a service provided by CAE Inc., a Canadian company with a presence in Poland. Among its customers are Scandinavian Airlines, United Airlines, Japan Airlines, and Turkish Airlines. Moreover, CAE is actively testing its systems both as a CFSP and with active customers on the NM B2B PreOps platform, underscoring its commitment to continuous improvement and innovation.

Flight Keys: Flight Keys is a provider of flight plan filing systems in the European market, with a notable customer base that currently includes major American carriers such as American Airlines and Delta operating in the EU. Flight Keys is actively testing FF-ICE on the NM B2B PreOps platform but have yet not any customer involved in this testing.

Navblue: Navblue is a provider of flight planning systems in the EU, serving a airspace users that includes i.e Pakistan Airlines. NavBlue is currently testing in PreOps but have no customer involved in this process so far.

Boeing: Boeing provides Flight Planning System Solutions for international Airspace users operating globally. They have tested extensively during 2024 and are expected to go operational with some of their customer during the course of 2025.

Air Support: Air Support provides flight planning system solutions for especially a smaller number of AU operating in Europe (e.g. Luxair and Corsica Air). Air Support has been involved in FF-ICE discussions for a long time and have recently in 2024 started the testing of the system in NM B2B PreOps.

There are still some Airspace Users (AUs) using internally developed tools. However, a clear trend is emerging where both EU-based and global AUs are increasingly opting for professional providers that offer tailored solutions.

3.3.3. SDM analysis

The picture of the AUs implementation planning is only partial since the feedback was received from a limited number of airspace users, responsible for 40.4% of the flights² (based on 2024 traffic). It is similar to the level of answers of last year (38% of flights).

Considering that most AUs have indicated a plan in line with the mandated CP1 target date, it can be assumed that a significant number of other AUs would be capable to implement by the deadline or shortly afterwards despite they have not reported back to the SDM.

However, this assumption and received planning may be questioned considering the status of testing using the NM B2B FF-ICE/R1 services in NM PreOps (by AUs or by CFSPs) and the conditions upon which an Airspace User may be assessed as compliant to the mandate. (Please refer to the section 3.2 NM FF-ICE/R1 B2B implementation and validation Planning for further details and analysis).

Currently no airspace user is yet complying to the mandate and only one, Lufthansa, has obtained an NM B2B OPS certificate for use of the FF-ICE/R1 filing service in the NM Ops platform. However, while Lufthansa successfully filed the first operational eFPL in 2022, it is currently not filing any operational eFPLs.

Furthermore, the questionnaire included questions about the rollout of eFPL filing to city pairs, but received very limited responses.

Another critical issue relates to the conformance of the information in the filed flight plan with the requirements as expressed in the FF-ICE/R1 Information Exchange Requirements published by the SDM (i.e. mandatory information such as performance profiles, climb schedules, and descent speed schedules). An examination of the flight plans filed through the PreOps platform has revealed an inconsistent and low adherence to such requirements.

ANSPs believe this would impact their implementation. ANSPs will need to develop systems capable of using the enhanced information. The absence of the required information in the eFPL could make that implementation more complicated as they need robust data for their testing and validation before going into operations. The provision of the missing data will be a support to the ANSPs to reduce delay; it could be an incentive for AUs to accelerate their deployment and would be a positive tendency towards a harmonised deployment of CP1.

The end goal is clear, but significant work remains for both AUs and their CFSPs to implement FF-ICE/R1 in Europe successfully. Without the provision of all mandated data, full compliance—and consequently, the anticipated benefits—will not be achieved.

² Flights from / to / overflying the mandated airspace (EU / Swiss / Norway)

3.3.4. Actions

A list of support actions was identified last year and reviewed for this roadmap edition whose status is provided below:

- Engage directly with AUs to discuss and understand their FF-ICE/R1 rollout plans, including their testing schedules and NM B2B validation processes and their intentions to provide complete data according to the FF-ICE/R1 Information Exchange Requirements.
 - *On-going, NM (B2B validation team) is engaged with CFSPs / AUs having started their PREOPS testing to support them and define further an operational validation planning with them*
- Continue the ongoing awareness campaign to ensure that all mandated AUs are informed and up-to-date on their responsibilities.
 - *On-going. Several communication actions were performed last year including running of SDM FF-ICE information workshops dedicated to AUs by video conference, communication about FF-ICE/R1 implementation in international fora (e.g. EU TBO symposium), development of a NM Webpage dedicated to FF-ICE/R1 implementation, implementation of a "warning text" regarding the timeline of implementation of FF-ICE/R1 / eFPL included in the Acknowledgement message after an ICAO2012/ADEXP format FPM is received and processed by the NM platform.*
- Develop a post-filing monitoring process to analyse eFPL content, verifying that all required information is included and discuss this process with States/NSAs/EASA for its potential use in their compliance assessment. This may involve reviewing sample eFPLs filed both in PreOps and, more importantly, in OPS.
 - *To be done*
- Enhance global awareness of FF-ICE/R1 implementation in Europe, fostering global interoperability for AUs. Continue collaboration with the FAA and Nav Canada and start the collaboration with ICAO Paris who has been tasked regionally to support FF-ICE/R1 implementation.
 - *On-going, contact with ICAO Paris established and their inclusion in FPFDE Sub Group and other distribution list already done. There will additionally also be a link with the FF-ICE initiative and the ICAO Paris ensuring efficient coordination and no duplication of work., see also 3.3.1*
- Ensure the full publication of the EU FF-ICE/R1 AIC, making it accessible to all relevant stakeholders for comprehensive understanding and compliance.
 - *On-going, see also 3.1*

3.4. ANSPs implementation planning: ACCs / APPs / TWRs

CP1 mandates that all aeronautical information, flight information and cooperative network data exchanges must be implemented by area control centres of the EATMN (as defined in CIR (EU) 2021/116, Annex, point 5.3), by the airports referred in the point 1.2 of the Annex of CP1 regulation, aeronautical information service providers and by the Network Manager.

Therefore, the FF-ICE/R1 implementation concerns the ANSPs providing ATS services in:

- ACCs in the EU Member States, Switzerland and Norway (EU27+2)

- Approach control units serving the airports³ listed
- Aerodrome control towers operating in the airports listed

The rollout of FF-ICE/R1 will be gradual, where ground stakeholders will update their system transitioning to FF-ICE/R1 both through updates and implementations of new systems. It is common for ANSPs to establish initial operational capabilities before fully implementing the system. These initial steps include data exchange via SWIM, setting up gateways, and partial system integrations, laying the groundwork for comprehensive implementation including the modifications of systems and procedures to actually make use of the new information provided through eFPL.

3.4.1. *Reported planning information*

The planning information individually reported by States/ANSPs is presented in the sections below through different charts presenting the global overviews at European level for a better general understanding of the situation.

The Annex provides for each State/ANSP more detailed information on the planning of implementation as reported during the Monitoring Exercise 2024 and further refined through bilateral interactions. This information (when available) is useful to understand any current progress, the complexity and approach to the implementation (i.e. which systems are concerned –per ACC-, potential use of “gateways/brokers” interfacing NM B2B FF-ICE/R1 Services for the benefit of several ATM systems, relations between TWR Systems and APP/ACC Systems), the different (if any) implementation dates per type of service.

The full information reported by each State/ANSP will be available within the SDP Monitoring View 2024.

3.4.1.1. *Overall implementation planning (Country level, Services)*

The figures in that section below provide respectively with:

- the estimated implementation dates for the full compliance reported by each State (/mandated ANSP) during the Monitoring Exercise 2024,
- the estimated implementation dates as reported for each FF-ICE/R1 service during the Monitoring Exercise 2024,
- comparisons between the overall estimated implementation dates reported at the level of States/ANSPs in the FF-ICE Roadmap 2023 and the overall estimated implementation dates reported during the Monitoring Exercise 2024.

³ Adolfo Suarez Madrid-Barajas, Amsterdam Schiphol, Barcelona El Prat, Berlin Brandenburg, Brussels National, Copenhagen Kastrup, Dublin, Düsseldorf International, Frankfurt International, Milan-Malpensa, Munich Franz Josef Strauss, Nice Cote d’Azur, Palma De Mallorca Son Sant Joan, Paris CDG, Paris Orly, Rome-Fiumicino, Stockholm Arlanda, Vienna Schwechat

Full Compliance Roadmap – Country level

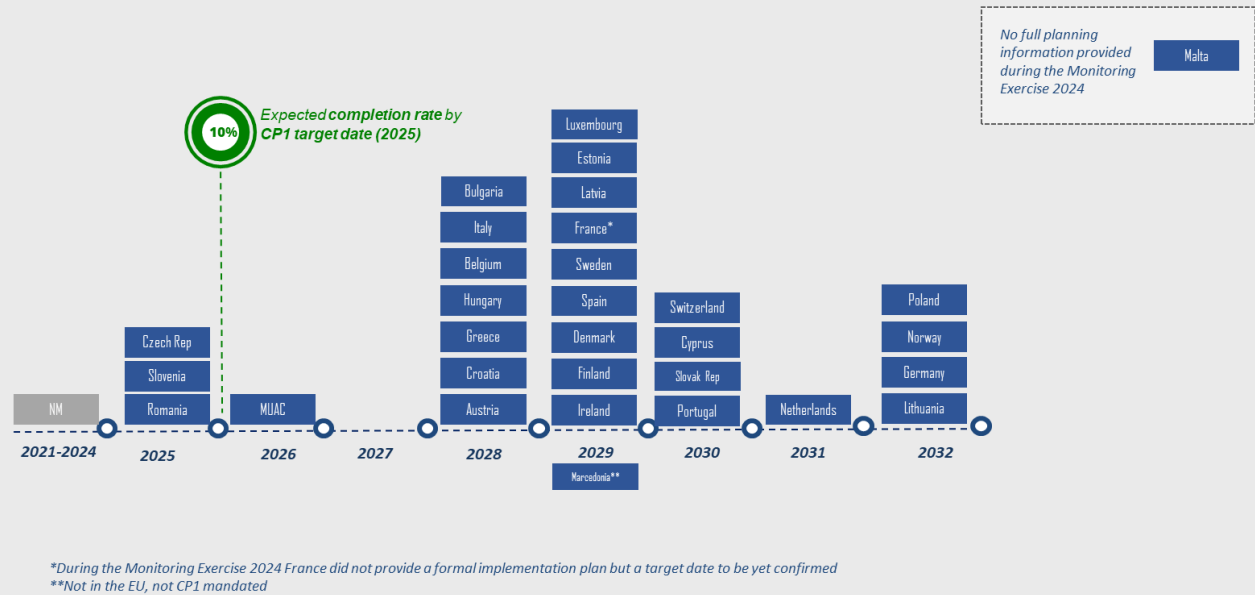


Figure 5 States/ANSPs' Implementation Planning -not including AROs- (Country level)

Number of States/ANSPs' completion per year

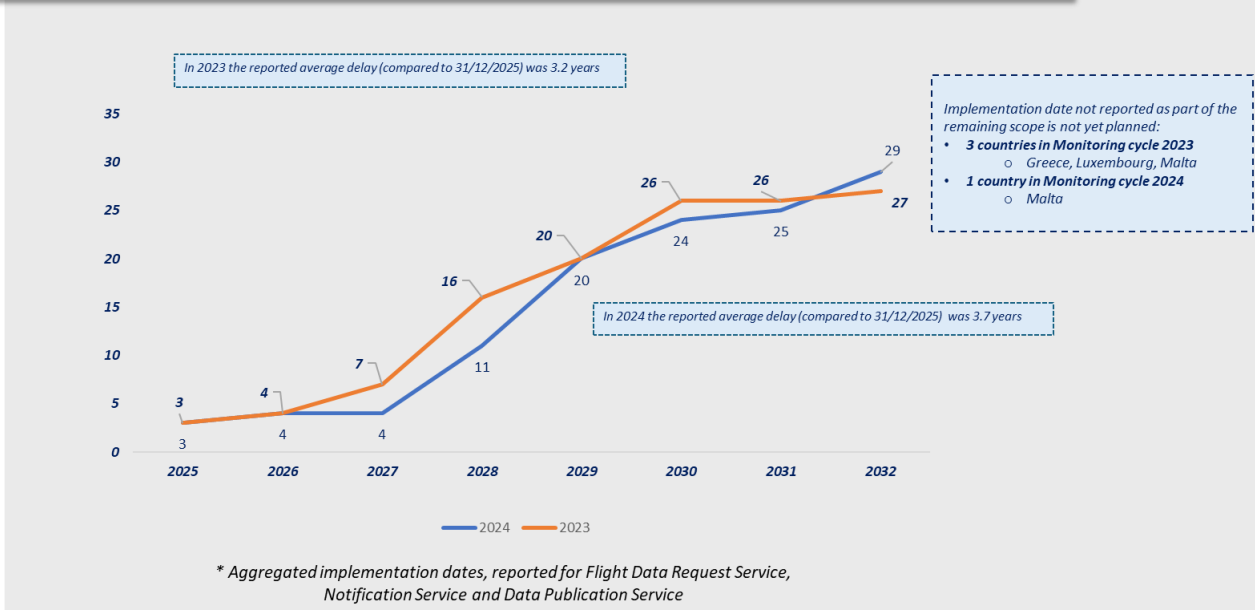


Figure 6 Comparison between 2024 and 2023 monitoring – Number of States' completion per year

Flight Data Request Service

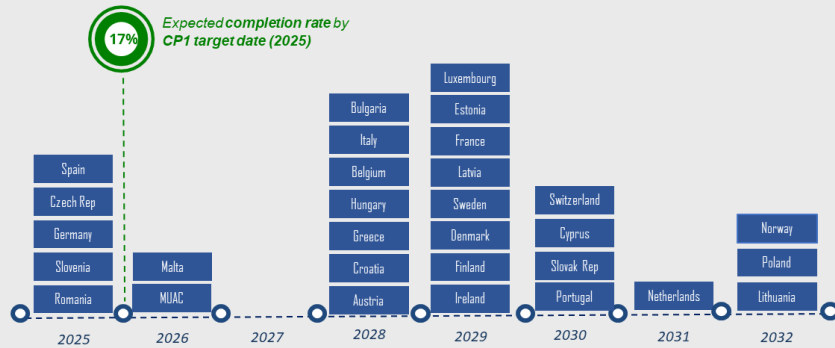


Figure 7 ANSPs' Implementation Planning (Flight Data request service – Country level)

Notification Service

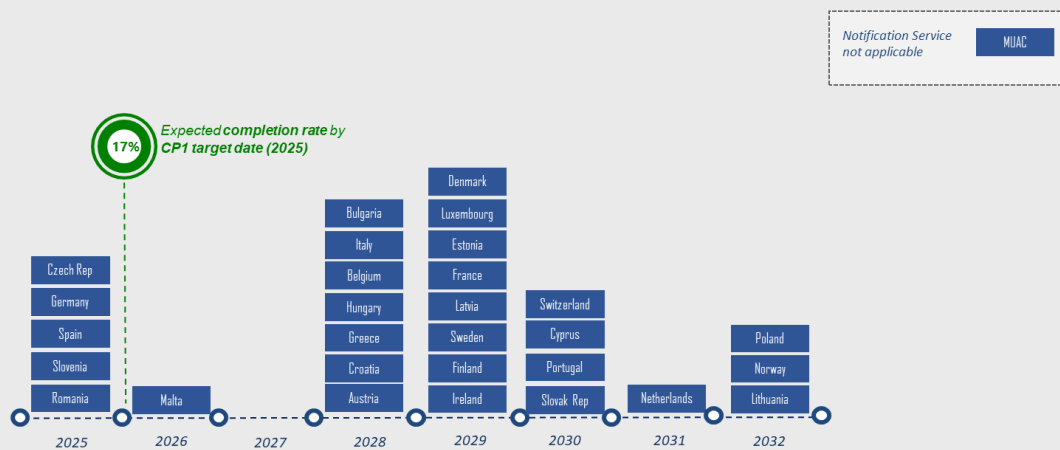


Figure 8 ANSPs' Implementation Planning (Notification service – Country level)

Data Publication Service

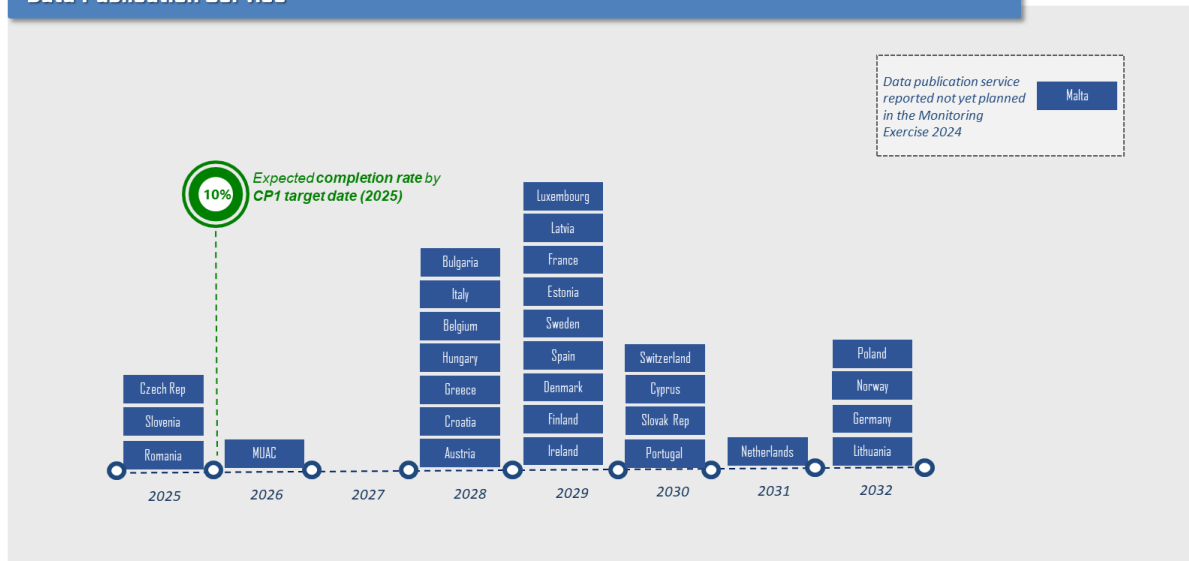


Figure 9 ANSPs' Implementation Planning (Data Publication service – Country level)

3.4.2. Implementation Planning concerning Area Control Centres (ACCs)

Full Compliance Roadmap – ACC level

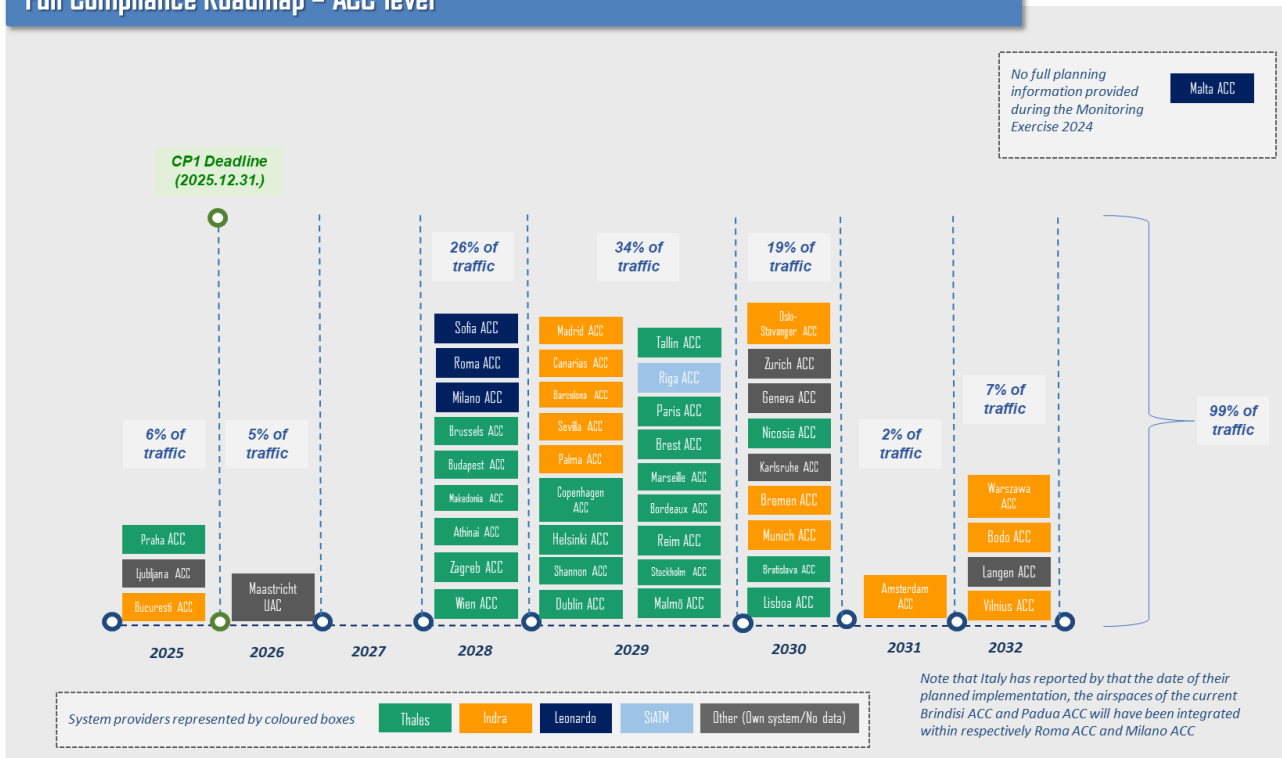
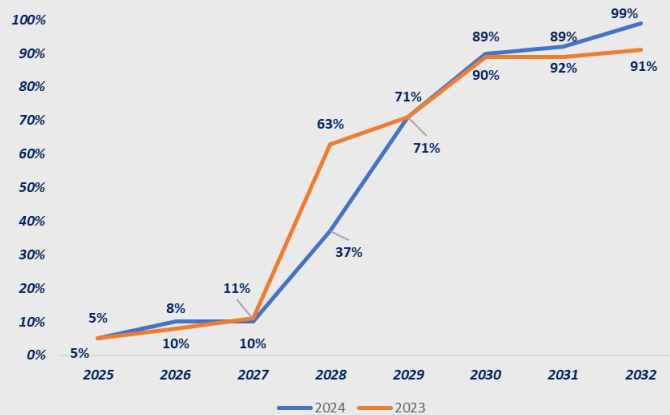


Figure 10 ANSPs' Implementation Planning (Full compliance - ACC level)

Percentage of "traffic completion"



Implementation date reported Not yet planned (no completion date) by:

- 3 countries in Monitoring cycle 2023
 - Greece, Luxembourg, Malta
- 1 country in Monitoring cycle 2024
 - Malta

*29 Stakeholders considered for the traffic data, 26 EU member states/MUAC+ Norway & Switzerland, excluding Luxembourg

Figure 11 Comparison between 2024 and 2023 monitoring - "Traffic completion" per year

Main ATM System / FDP Providers in Europe

In Europe, there are three major ATM systems / FDP providers (THALES, INDRA and Leonardo) with different sets of customers. A smaller Swedish company, SI ATM, also provides ATM systems (LGS). Then some ANSPs rely on internal systems development.

Thales provides and supports ATM systems for 15 ANSPs in the EU/Switzerland/Norway area, tailoring their system offerings to meet individual customer needs. Currently, no deployed Thales system is compliant with CP1 FF-ICE/R1 requirements. Thales is developing a new generation ATM system, TopSky ATC One, which should allow CP1 FF-ICE/R1 compliance. That is the solution chosen by the COOPANS alliance partners (Austria, Croatia, Ireland, Denmark, Portugal, Sweden), Hungary and Belgium while Czech Republic has chosen for an update of their TopSky system, and France will have the FF-ICE/R1 implementation as an update of their 4Flight new system.

Indra, servicing 7 ANSPs in the EU/Switzerland/Norway area, is advancing with some key customers towards the development and implementation of the "ITEC SkyNex," a next-generation ATM system that will include FF-ICE/R1 capability. Romania has chosen to have an update of their Indra current System

Leonardo supports 3 ANSPs in Europe.

SI ATM collaborates with 1 ANSP (LGS) on ATM system maintenance and development, working towards CP1 compliance through system modifications or new solutions.

Two ANSPs (MUAC and Slovenia Control) manage their own development of ATM systems with inhouse development and expertise while DFS is an INDRA customer or a developer depending on the ACC concerned. The ANSPs receive technical support from the original manufacturers but have managed to be independent and in charge of own implementation and build updates.

System providers

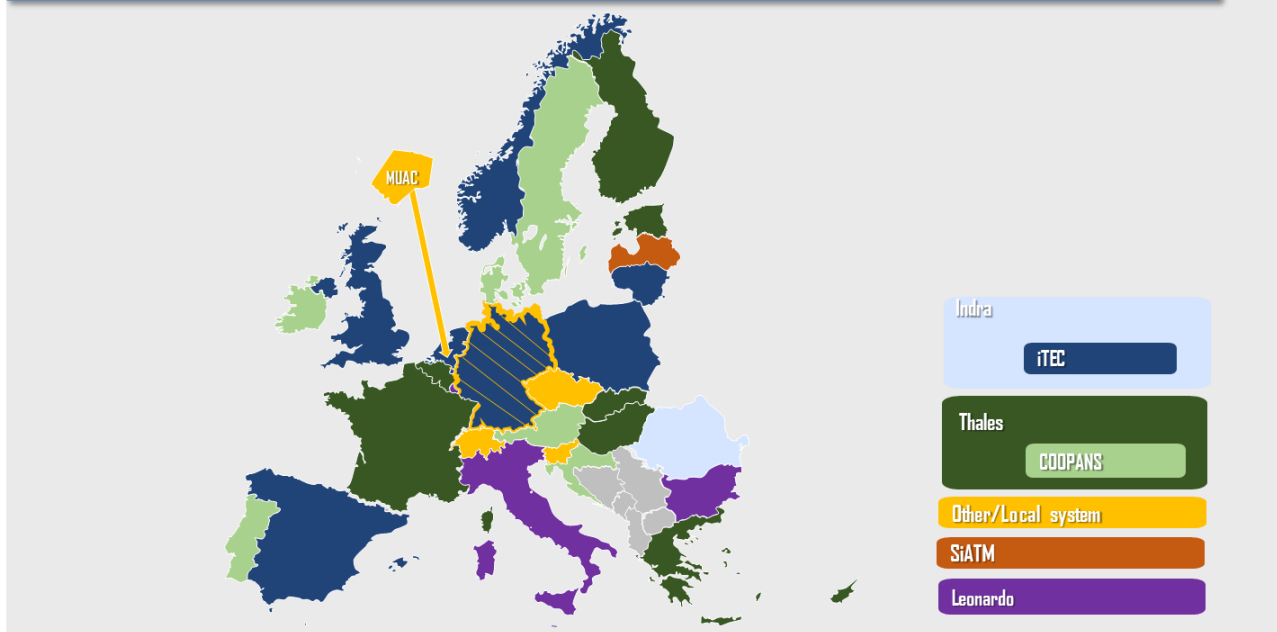


Figure 12 Map of main ATM/FDPs Systems Providers (for ACCs)

3.4.2.1. Planning for Mandated TWR and APP Systems

Regulation 116/2021, section 5.3 (a), mandates updates for Tower (TWR) and Approach (APP) systems in specific airports across Europe (listed in section 1.2):

- Austria (Vienna Schwechat)
- Belgium (Brussels National)
- Denmark (Copenhagen Kastrup)
- France (Paris-CDG, Paris-Orly, Nice Cote d'Azur)
- Germany (Berlin Brandenburg Airport, Düsseldorf International, Frankfurt International, Munich Franz Josef Strauss)
- Ireland (Dublin;)
- Italy (Rome-Fiumicino, Milan-Malpensa)
- Netherlands (Amsterdam Schiphol)
- Spain (Barcelona El Prat, Adolfo Suarez Madrid-Barajas, Palma De Mallorca Son Sant Joan)
- Sweden (Stockholm-Arlanda)

Additionally, Switzerland (Zurich Airport) and Norway (Oslo Gardermoen) are mandated by national law, although not mentioned in CP1.

The SESAR Deployment Programme (SDP) identifies key air traffic management systems, including the Electronic Flight Strip System (EFS), the Advanced Surface Movement Guidance and Control System (A-SMGCS), and the Departure Manager (DMAN). Ownership of these systems may be shared between Airport Operators and Air Navigation Service Providers (ANSPs), reflecting the diverse and complex operational landscape within the tower environment in Europe. The allocation of organizational responsibilities is formally documented in the SDP Monitoring View. Specifically, if an Airport Operator owns tower equipment, it is responsible for reporting its status of implementation and estimated

implementation date during the SDP Monitoring Exercise accordingly to reflect its role in the system's operation and maintenance.

A minimum requirement for implementation is that flight plan information consumed by these systems, whether directly or indirectly, must originate from the eFPL information available through the Network Manager FF-ICE/R1 services. However, no specific functional minimum requirements have been defined regarding how these systems utilize the new eFPL data, and therefore, no predefined use cases have been developed at this stage.

From a technical standpoint, the integration of the Global Unique Flight Identifier (GUFI) within tower systems is mandatory under Requirement FFICE-316 in the SDP 2024 edition. For clarity, it should be noted that potential use cases related to the operator flight plan version and the aircraft take-off mass (both mentioned in FFICE-316) are currently considered unlikely, for the following reasons:

- **Operator Flight Plan Version:**

The use of "Operator Flight Plan Version" in an airport's operations environment is not foreseen to be relevant, as the content of the eFPL for this phase in the flight is very limited. Information for efficient management of arrivals and departures are received from other sources and systems, why there is no operational need to coordinate "Operator Flight Plan Version" between ground and pilot.

- **Aircraft Take-Off Mass:**

The aircraft's take-off mass is not expected to impact airport operations. Runway separation are based on Wake Turbulence Categories, not on only aircraft mass. Additionally, the structured use of Standard Instrument Departures (SIDs) further reduces the operational relevance of take-off mass for airport operations.

GUFI serves as a standardized and persistent identifier for each flight, ensuring seamless data exchange, enhanced traceability, and improved interoperability across various air traffic management systems. This requirement supports situational awareness, coordination, and operational efficiency within a diverse tower environment.

The following figure provides the reported planning for TWR Systems.

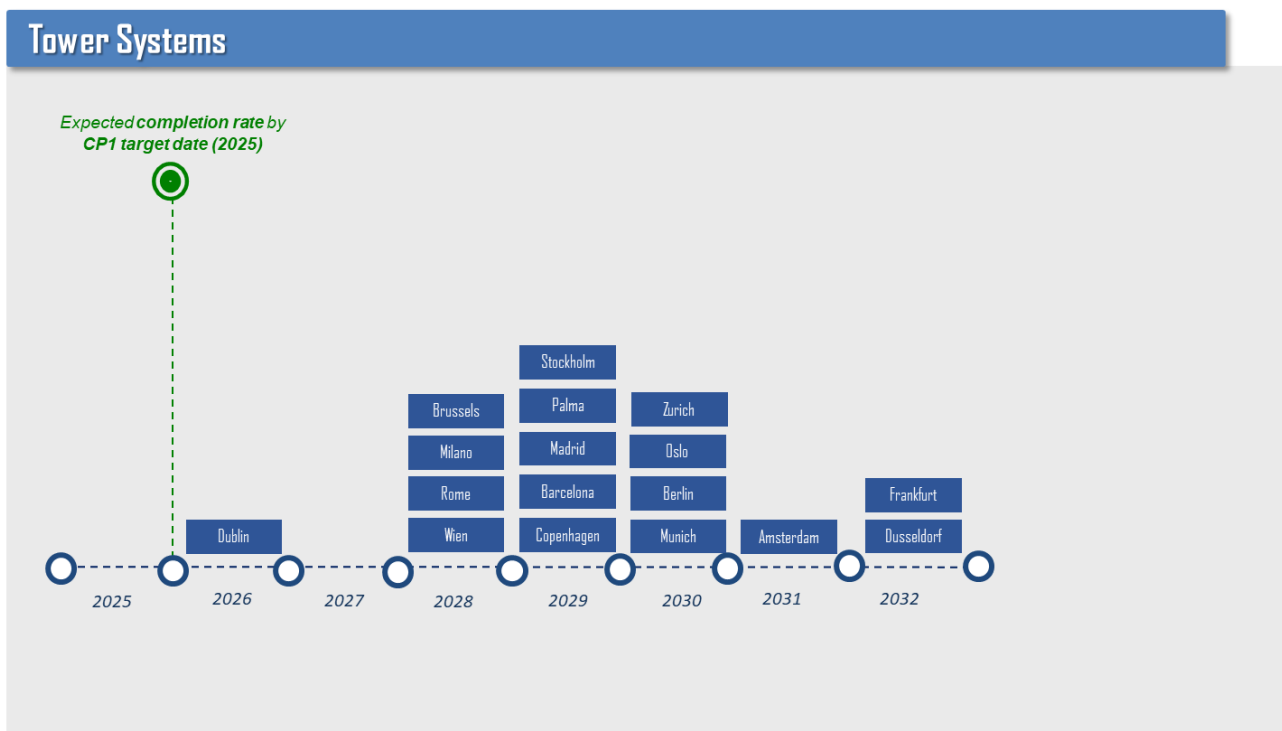


Figure 13 Planned implementation of FF-ICE/R1 in TWR Systems per airport

For mandated airports, the associated Approach (APP) systems are an integral part of the Area Control Centre (ACC), except in France where the APP operates independently from the ACC. Therefore, except for France, there is no need for dates of implementation of the APPs other than those reported in *Figure 10 ANSPs' Implementation Planning (Full compliance - ACC level)*. France does not have yet a planned date of final implementation for their three mandated APPs.

3.4.3. SDM Analysis

The substantial delays, already visible last year regarding the ANSPs' implementation of FF-ICE/R1 in Europe compared to the CP1 target date (31/12/2025) are confirmed by this year reporting. Full implementation remains not expected before end of 2032, as shown in the *Figure 5 States/ANSPs' Implementation Planning -not including AROs- (Country level)* above. Furthermore, the average delay with regard to the mandated date of implementation has increased from 3.2 years to 3.7 years.

Three ANSPs (Czech Republic, Romania, Slovenia) are planning to complete their implementation by the end of the year –through updating their current ATM/FDP system- in coherence with their planning of last year.

Last year, it was pointed out that many ANSPs choose to implement FF-ICE/R1 capabilities as part of their implementation of new ATC/FDP Systems and not as update to their existing systems, which is indeed confirmed this year.

This reflects that FF-ICE/R1 implementation delays are mostly due to many ANSPs' strategies, which they report as driven by rationalised investments and achievable planning.

It was previously assessed that the 2023 planning was not reliable due to the very few ANSPs having signed a contract (3 out of 29) for their main ATM/FDP by the end of 2024, or reporting having started any concrete activity. On this aspect, the planning situation may be more reliable this year with 13 ANSPs having a contract signature or having started to develop their own solution.

Planning uncertainty also stems heavily from the strategy of implementation of new systems (and their operational rollout). This is something surely riskier than an update of current systems as undertaken by the three ANSPs planning for an implementation by this year.

Another planning element where uncertainty still exists is the implementation planning per ACC where a State's airspace is covered by several ACCs. France, Greece, Ireland, Italy, Spain and Sweden did not provide different dates for their implementation in different ACCs. This remains to be seen whether this reflects an actual capability to deploy accordingly (particularly in the case of a new System and not an update of an existing one) or rather a lack of refined planning to that level yet.

In most cases, Tower systems rely on flight plan information provided by Air Navigation Service Providers (ANSPs), specifically from the Flight Data Processing (FDP) system (this dependency is illustrated in the different "systems' design diagrams" provided for each State in the Annex of this document).

As a result, most of TWR systems are dependent on the FF-ICE/R1 implementation within these core ATC systems and the current planning reflects this. Similar delays in FF-ICE/R1 adoption as observed in main ATC Systems and FDPs are visible.

From our understanding, only France operates specific Approach Control Centres related to their mandated airports (for the other, the approach control is ensured by the ACC (ATC System)). Unfortunately, France did not provide dates regarding the planned implementation of an FF-ICE/R1 capability for the related Centre / ATC Systems.

The planning details provided by ANSPs and Airports regarding the impacted TWR systems have been limited considering the challenges ahead.

In many cases, ANSPs operate TWR systems supplied by multiple manufacturers. This fragmentation introduces challenges in planning and implementation. Some ANSPs have indicated the need for system consolidation and simplification.

As another example, there is a growing tendency for TWR systems to interface with a SWIM middle layer. For example, a SWIM platform that consumes all FF-ICE/R1 services can be used to decouple TWR systems from direct connection to the ATC System/FDP infrastructure. This shift enhances flexibility, interoperability, and scalability in the integration of new services.

Our assumption is therefore that the overall TWR Systems planning stability remains to be improved.

Early and partial implementations

On the positive side and in supplement to the implementation planned by the end of 2025 for Czech Republic, Romania, Slovenia, some other partial operational implementations are planned by different ANSPs at an earlier date than their final implementation date. This is depicted in the following figure.

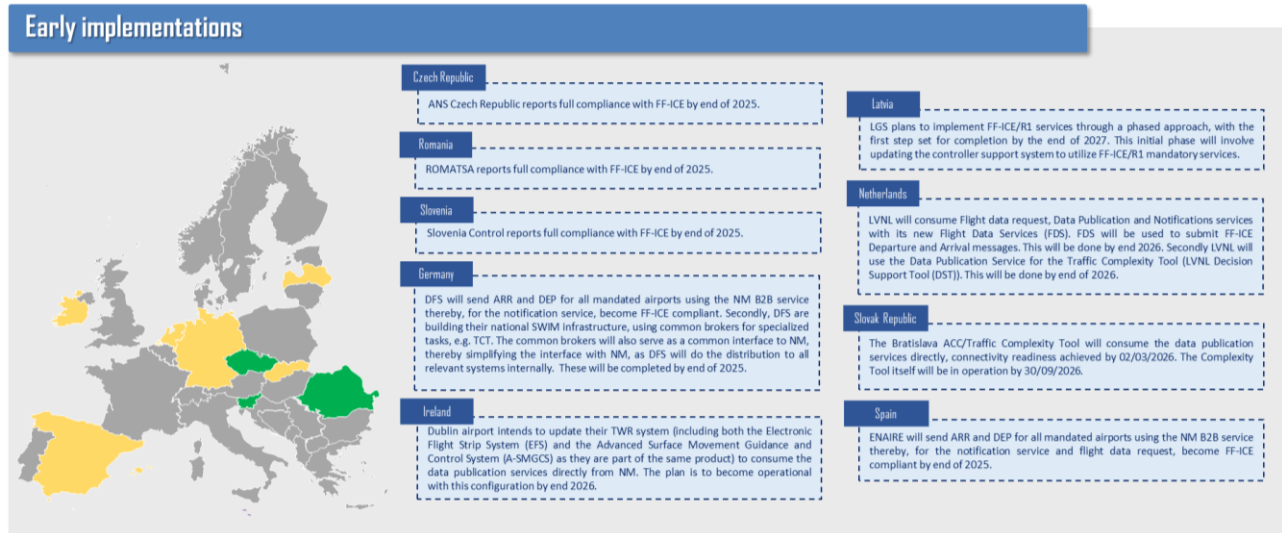


Figure 14 Map of early and partial implementations

Due to the significant delays already visible in the previous edition of the FF-ICE Implementation Roadmap, SDM was questioned regarding the impacts of such delays. SDM performed then an AF5-AF6 sensitivity analysis (as delays impact were also sought for AF6). The analysis took an assumption of a 5-year delays of the implementation (as a worst-case scenario) whereas in this year's version of the roadmap the average delay computed is of 3.7 years.

The results of the analysis were the following. The potential loss of monetary benefits associated with a postponement of 5.6.1 (5 years delay) is estimated at €463m between 2025 and 2035. This is a reduction of around 9% of all the value associated to FF-ICE or less than 1% of overall benefits of CP1 (all families for 2014-2040). In a per flight value, this represents less than €3.5 per flight for the period considered.

3.4.4. Actions

In relation to the analysis above, an initial list of actions has been identified and initiated:

- To continue to support the ANSPs in the use case work elaborating on the assessed benefits derived from the implementation.
 - Done for the elaboration of initial use cases (see 2.3). SDM will now monitor the implementation of use cases as part of ANSPs' test and operational system to reflect on that appropriately.
- To organise bilateral discussions with ANSPs to allow an elaboration of their planning to the level of details required (e.g. per each ACC and mandated Approach control unit) and discuss further any possible mitigation actions to accelerate implementation process as discussed in particular during the IBG consultation meeting. This will include engaging with the ANSPs who didn't report yet in this monitoring exercise.
 - Done and on-going
- To provide a technical support to the stakeholders in their implementations through bilateral meetings and workshops (e.g. within the FPFDE Sub-group)
 - Done (e.g. regular topics at FPFDE, specific ANSPs FF-ICE/R1 implementation lessons learned workshop) and on-going

- To continue engaging with the Manufacturers to discuss their technical readiness and any issues potentially impacting on the ANSPs' consolidated planning.
 - Done (some meetings held) and to be continued
- To reflect on whether / how the monitoring should include other States (e.g. UK) also willing to implement FF-ICE / R1
 - To be done (next step will be to coordinate with ICAO Paris to reflect on that)
- To make a full mapping of Airport/TWR systems impacted by the FF-ICE/R1 implementation.
 - To be done
- To evaluate the need to support the Stakeholders in developing any Use Cases for TWR related Systems.
 - It was decided to pause this action, as the use and quality of the additional data in the eFPLs are still to be assessed by the ANSPs. Secondly, as indicated in the previous assessment, the additional data available in the eFPL, do not indicate the need/opportunity to elaborate new use cases for the TWR/airport environment. Despite the initial conclusion, SDM will engage with ANSPs to seek potential relevant functional/operational use cases. . This activity is expected to be restarted in 2025.
- To engage with TWR system manufacturers ensuring the full manufacturer awareness of the requirements.
 - Ongoing, SDM will collect TWR system manufacturers' information from ANSPs and Airports and progress this action thereafter.
- To organise bilateral discussions with ANSPs / Airports to allow their completion of the TWR Systems planning information to the level of details required (e.g. per each type of System concerned) and discuss further any possible mitigation actions.
 - On-going, SDM do already see a movement in this area, as some ANSP's / Airports has chosen, for the eFPLs, to "detach" the TWR system from the FDP, as many TWR system come with their own "FDP" enabling the TWR systems to directly consume the NM B2B services.

3.5.ATS Reporting Offices (AROs)

Although ATS Reporting Offices (AROs) are not explicitly mentioned in the CP1 regulation, they are mandated and designated by EU Member States to facilitate flight plan filing for AUs. With CP1 requiring all AUs operating in EU airspace to submit FF-ICE/R1 flight plans (for IFR/GAT or mixed VFR/IFR flights (including military GAT)) in the EATMN Airspace, AROs will need to enhance their capabilities to accommodate this new flight plan format and content requirements, particularly for those filing IFR flight plans through local AROs. Additionally, existing EASA regulations, which complement CP1, mandate AROs to support flight plan submission and reception

Considering the current flight plans submitted through AROs, this concerns approximately 2.5% of European IFR traffic.

In that perspective, AROs are required to at least consume the Filing Service and the Flight Data Request Service, as provided by the Network Manager.

Data collection and feedback

AROs monitoring is performed through a dedicated questionnaire. This questionnaire collects information on their implementation plans for all CP1-mandated FF-ICE/R1 services, including the Filing Service, Notification Service, and Flight Data Request Service.

3.5.1. Reported Planning

All 29 states have responded to the questionnaire. Of these, 22 states have indicated varying implementation timelines stretching from 2025 to 2030. Six states have not provided expected implementation dates, expressing that their timelines depend on the availability of FF-ICE/R1 capabilities in eEAD. Meanwhile, Estonia has reported no current intention to implement the Filing service. Croatia indicated that they would decide, by 30 April 2025, which option to implement, a) Upgrade the Thales' AIM system to the version compliant with the CP1/AF5.6 in ARO, or b) Implement eEAD in ARO.

Expected completion rate 2025 roadmap: ATS Reporting Offices (ARO)

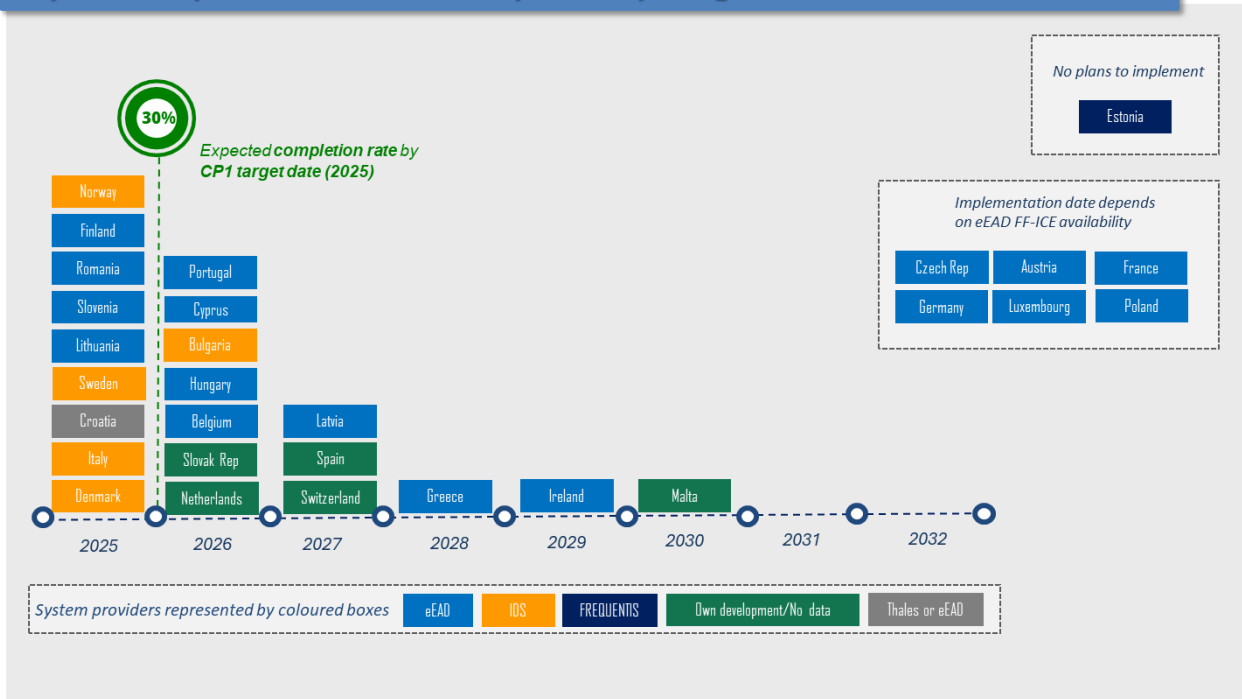


Figure 15 Planning of availability of FF-ICE/R1 capable AROs

3.5.2. ARO system manufacturer readiness

The identified number of ARO system providers in the EU is limited. They are EUROCONTROL with EAD transitioning to the new enhanced EAD (eEAD), IDS, Frequentis and Thales.

With the introduction of FF-ICE/R1, the role of ARO systems is shifting from basic office functions—such as checking and forwarding flight plans for general aviation—to more advanced capabilities, including trajectory calculation required for the eFPL. This necessitates a significant evolution from today's relatively simple systems.

Currently, no provider has fully implemented these capabilities. Industry system providers expect to deliver the required functionality by the end of 2025.

EUROCONTROL also plans the availability of FF-ICE/R1 capabilities within eEAD by December 2025. The roll-out by an ANSP of an operational functionality will then depend on their use of eEAD in B2B or B2C and any required adaptation, training...

In terms of testing, IDS and Frequentis have conducted some trials in PreOps, but these have primarily focused on simple FIXM flight plans without incorporating all the necessary data to meet CP1 requirements. As a result, manufacturers are not yet ready to provide systems that enable AROs to fully comply with CP1.

3.5.3. SDM Analysis

The responses indicate that ARO implementation plans remain at an initial stage.

Considering the industrial readiness as described in previous section, the feasibility of an operational implementation (i.e. an operational ARO providing a FF-ICE/R1 filing capability) before the end of 2025, as reported by 9 States, seems challenging.

Six states have not provided planning information expressing that it would depend on the availability of eEAD, including documentation, training and availability for tests. EAD indicated that the Support to

ARO functionality of eEAD is planned to be delivered by December 15th, 2025. This includes the as-is of the EAD, so technically without the eFPL capabilities. For the eFPL capabilities there is a best-effort commitment to do this as well for 15 December 2025 but no guarantee. This is information shared with EAD clients for the last months, and also NDTECH was informed of this development and roll-out plan of eEAD products and the associated availability of documents, systems, etc. All EAD clients need to plan together with the EAD Team their eEAD products/functions deployment based on this planning information for the coming transition period that needs to be concluded by June 2027.

3.5.4. Actions

- Follow up meetings with the industry to ensure that the solutions and systems being developed and delivered are full consistent with what is mandated by CP1
 - On-going
- Reach out to States so that their roles and obligations may be coordinated and consistent (e.g. publication of AIC, decision on AROs)
 - Done, see 3.1
- Extend the NM B2B validation process to AROs, including any set up of a monitoring process in relation to compliance assessment
 - To be started

3.6. Military Stakeholders

Military Stakeholders are also affected by the CP1 regulation and are required to ensure that civil-military information exchanges continue seamlessly. According to the CP1 regulation, when deploying SWIM functionality, Member States must guarantee that civil-military cooperation is maintained as required by point 3.2 of Annex VIII of Regulation (EU) 2018/1139.

Currently, military aircraft operators file flight plans either through their own systems or via the local ARO office. When operating as General Air Traffic (GAT), they will be required to file an electronic Flight Plan (eFPL) by December 31, 2025, in line with commercial traffic CP1 FF-ICE/R1 requirements. Although the military is part of the SDP Monitoring process, its compliance with CP1 is not monitored through this framework but rather through a dedicated SDM questionnaire. This year, 20 out of 29 military authorities responded to the questionnaire. However, the responses and the data provided raised concerns.

Out of the 20 responses received, only three demonstrated that an assessment had been conducted and acknowledged the applicability of CP1 requirements to military traffic. The remaining responses largely dismissed CP1 as "not applicable", highlighting a lack of awareness of regulatory obligations. Additionally, the responses revealed misunderstandings about the implications of these requirements on daily military operations within the EU.

Encouragingly, there are already positive examples of military organizations taking steps toward trajectory-based operations through major system upgrade projects. France, in particular, is well advanced in its planning for the implementation of CP1 regulations, especially FF-ICE/R1, recognizing the significant benefits it will bring to military operations.

Interaction with the U.S. military has resulted in concrete plans and implementation efforts from their side to upgrade their flight plan filing capabilities. They are progressively moving toward actual operational implementation, with their system provider already testing with the Network Manager (NM). This proactive approach stands in contrast to the lack of engagement as seen through many European military Stakeholders' responses and demonstrates how early adoption and collaboration can ensure compliance while delivering tangible operational benefits.

Actions

- Military FF-ICE/R1 awareness campaign in EU involving also States in the coordination

- On-going
 - To develop an FF-ICE/R1 impact document
- To be done

3.7. Further monitoring of the Implementation roadmap planning

As written in previous sections related to actions, bilateral discussions will be continued between the NM/SDM FF-ICE initiative and implementing Stakeholders to refine further the different planning available as necessary and provide any implementation support as required.

The next version of the Implementation Roadmap will be available in early 2026 after Stakeholders 2025 SDP monitoring information is available.

4. Individual ANSP Roadmaps

Detailed implementation report per ANSPs

This section provides for the detailed information reported by States / ANSPs in the framework of the SDP Monitoring Exercise 2024.

SDM has complemented this information with an architecture diagram (for each ANSP) interpreting at a very high level the design of the FF-ICE/R1 implementation by the different ACC/APP/TWR main Systems as it could be understood from the report and discussions with ANSPs.

In the 'FF-ICE/R1 Service deployment overview' tables included in the sections per state below, a '?' indicates where we have not receive any planning date yet, but do not currently have visibility of. An 'N/A' indicates a section where we would not expect the provision of a date, due to a lack of applicability of the corresponding system to the milestone or checkpoint. For example, if an ANSP's FDP consumes the FF-ICE services via a broker/SWIM platform, we would only expect dates for the FDP relating to 'DM2 – Operational Use', while 'DM1 – Connectivity' would only be applicable to the broker/SWIM platform.

4.1. Austria FF-ICE Release 1 Implementation Roadmap

Introduction

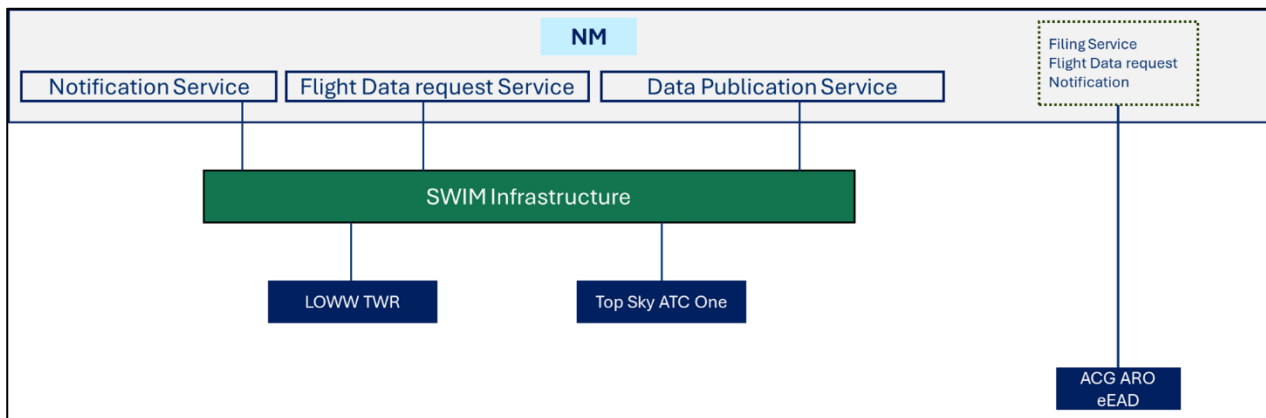
Austro Control (ACG) is part of the COOPANS Alliance, and there are no plans to use NM FF-ICE/R1 Formats and services in COOPANS Legacy System for 2025. Native processing of NM FF-ICE/R1 will be implemented in the next Generation ATM system (Top Sky ATC One) in 2027. Full operational capabilities will be available by the end of Q3 2028. The contract with Thales for the COOPANS alliance was signed in 2024.

ACG is currently deploying SWIM infrastructure to serve all SWIM stakeholders, including LOWW TWR, where a tendering process for the ITWP (Integrated Tower Working Position/upgraded TWR system) is underway. The legacy system will not be upgraded. ITWP will not consume eFPLs from the ATC One FDP or directly from NM. Instead, the SWIM Core will act as an intermediary for both ATC One and ITWP.

For ARO, ACG depends on the availability of eEAD, where ACG will use the eEAD updated filing function for the filing of eFPLs.

FF-ICE/R1 selected architecture approach

In the case of Austria, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Infrastructure	?	?	31/12/2026	N/A
Wien ACC/FDP	N/A	N/A	N/A	30/09/2028
LOWW TWR	N/A	N/A	N/A	30/09/2028

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Infrastructure	?	?	31/12/2026	N/A
Wien ACC/FDP	N/A	N/A	N/A	30/09/2028
LOWW TWR	N/A	N/A	N/A	30/09/2028

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Infrastructure	?	?	31/12/2026	N/A
Wien ACC/FDP	N/A	N/A	N/A	30/09/2028
LOWW TWR	N/A	N/A	N/A	30/09/2028

4.2. Belgium FF-ICE Release 1 Implementation Roadmap

Introduction

Belgium acknowledges that all systems consuming flight plans are impacted. For Belgium this includes at least the following systems: FDP, SWIM node, TCAST (Traffic Complexity Tool), AMS (Airport Movement System) and the EAD.

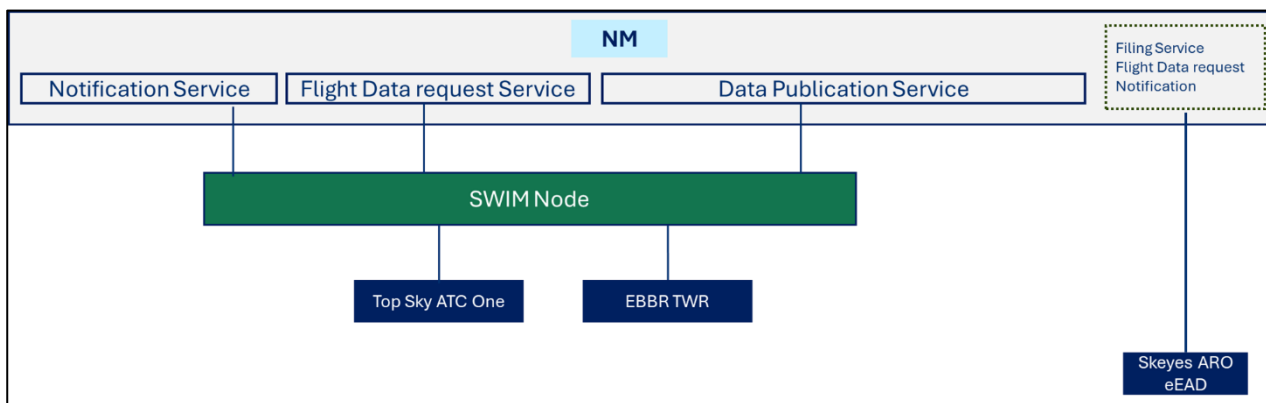
Skeyes has initiated a project to implement a SWIM infrastructure by the end of 2025, centred around a SWIM node. The implementation of FF-ICE/R1, and specifically the Flight Data Request Service, is crucial for the advancement of the current ATM system. Skeyes is dedicated to deploying the necessary FF-ICE/R1 services by the end of 2028, in conjunction with the deployment of its upgraded ATM system (TopSky ATC ONE) where a contract was signed in 2024 with Thales.

Furthermore, Skeyes actively participates in the Flight Plan and Flight Data Evolution Sub-Group (FPFDE SG). This sub-group is responsible for developing the implementation roadmap, specifications, requirements, and use cases for the FF-ICE services.

In terms of the consumption of the FF-ICE services, skeyes will utilise a SWIM node, which will provide a common connection to systems using the FF-ICE data, such as the Topsky ATC system as well as their TWR systems at EBBR.

FF-ICE/R1 selected architecture approach

In the case of Belgium, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Node	31/12/2025	31/12/2025	31/12/2025	N/A
Brussels ACC/FDP	N/A	N/A	N/A	31/12/2028
EBBR TWR	N/A	N/A	N/A	31/12/2028

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Node	31/12/2025	31/12/2025	31/12/2025	N/A
Brussels ACC/FDP	N/A	N/A	N/A	31/12/2028
EBBR TWR	N/A	N/A	N/A	31/12/2028

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Node	31/12/2025	31/12/2025	31/12/2025	N/A
Brussels ACC/FDP	N/A	N/A	N/A	31/12/2028
EBBR TWR	N/A	N/A	N/A	31/12/2028

Brussels ACC, Traffic Complexity Tool	N/A	N/A	N/A	31/12/2028
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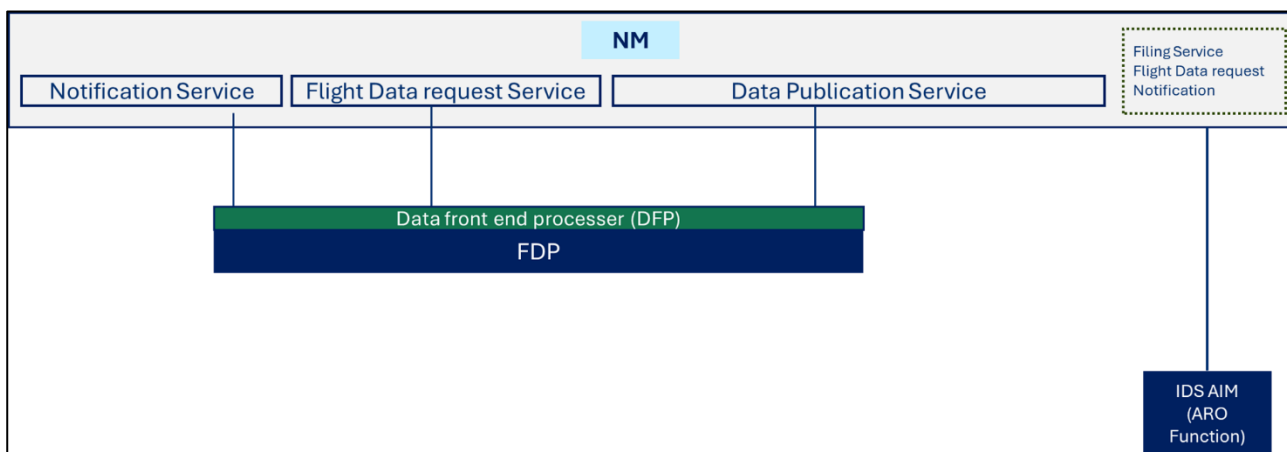
4.3. Bulgaria FF-ICE Release 1 Implementation Roadmap

Introduction

BULATSA plans to sign a contract with its ATM system provider Leonardo by the end of 2025 and has already fully specified the new ATM system. The system will include a data front-end processor for communication with NM and will leverage enhanced data for trajectory computation. For ARO, BULATSA will rely on IDS AIM and eEAD as a back-up plan.

FF-ICE/R1 selected architecture approach

In the case of Bulgaria, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Sofia ACC/FDP	01/06/2027	30/06/2027	31/12/2027	30/06/2028

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Sofia ACC/FDP	01/06/2027	30/06/2027	31/12/2027	30/06/2028

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Sofia ACC/FDP	01/06/2027	30/06/2027	31/12/2027	30/06/2028

4.4. Croatia FF-ICE Release 1 Implementation Roadmap

Introduction

As a member of the COOPANS alliance, Croatia Control are aligned with the other COOPANS members in terms of FF-ICE/R1 implementation. Consequently, there are no plans to consume NM FF-ICE/R1 formats in their current ATM system (TopSky) for 2025.

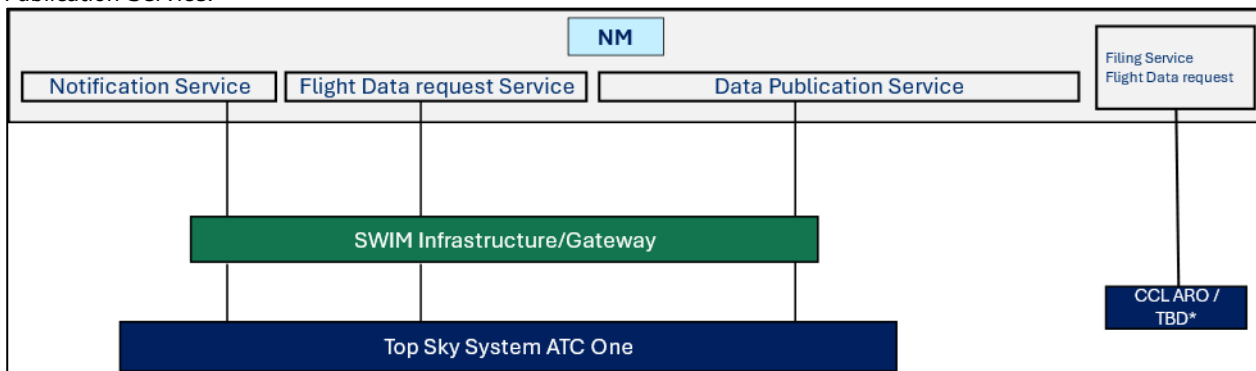
Native processing of NM FF-ICE/R1 information will be implemented within the main ATM system upgrade that will take place in Q1/2028. While the new ATM System Top Sky ATC One will be capable of consuming FF-ICE services directly, CCL similar to other COOPANS stakeholders will consume the services through a dedicated own SWIM infrastructure.

In terms of the ARO functionality, Croatia Control plans, by 30 April 2025, to decide which of the following options to implement, depending on results of consultations with EUROCONTROL and Thales:

- a) Upgrade the Thales' AIM system to the version compliant with the CP1/AF5.6 in ARO, or
- b) Implement eEAD in ARO

FF-ICE/R1 selected architecture approach

In the case of Croatia, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Zagreb ACC/FDP	N/A	N/A	30/09/2027	31/03/2028

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Zagreb ACC/FDP	N/A	N/A	30/09/2027	31/03/2028

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Zagreb ACC/FDP	N/A	N/A	30/09/2027	31/03/2028

4.5. Cyprus FF-ICE Release 1 Implementation Roadmap

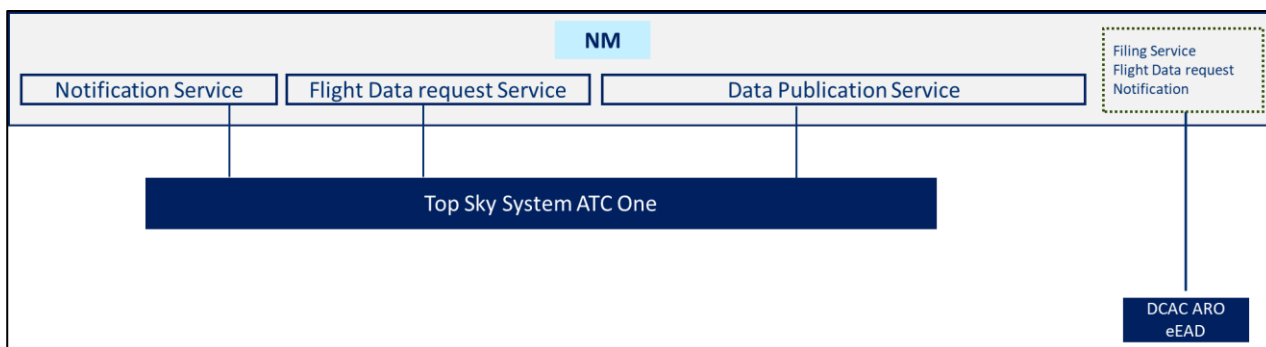
Introduction

DCAC is about to embark on a new project with its ATM system provider Thales to upgrade the current ATM system including additional CP1 functionalities as well as hardware. This approach would be an interim stepping stone towards acquiring the future ATM system (Top Sky ATC ONE) by THALES which will allow compliance with the CP1 requirements. Full compliance with the CP1 requirements is planned by the end of 2030.

Based on the current architecture planning, the DCAC FDP will consume the NM B2B services directly rather than through a SWIM gateway. With regards to ARO FF-ICE/R1 implementation DCAC is relying on the system of eEAD.

FF-ICE/R1 selected architecture approach

In the case of Cyprus, the approach is covering all FF-ICE services, Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Nicosia ACC/FDP	?	?	31/12/2030	31/12/2030

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Nicosia ACC/FDP	?	?	31/12/2030	31/12/2030

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Nicosia ACC/FDP	?	?	31/12/2030	31/12/2030

4.6. Czech Republic FF-ICE Release 1 Implementation Roadmap

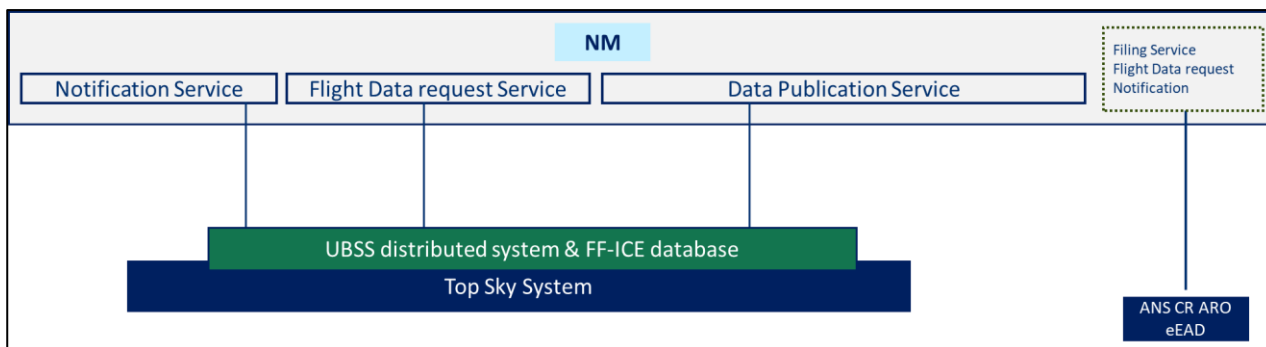
Introduction

ANS CR will have implemented all of 3 needed services of FF-ICE (Flight Data Request Service, Notification Service and Data Publication Service) by the end of 2025, with implementation taking place over the course of the year.

ANS CR has one main Flight Data Processing System TopSky, and one supporting/fallback system: ESUP. These main and fallback system work together, and there is a proprietary interface for data exchange between the two systems, while communication with the NM will be implemented on both of them.

FF-ICE/R1 Service deployment Overview

In the case of the Czech Republic, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Praha ACC/FDP	01/06/2025	01/06/2025	31/12/2025	31/12/2025

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Praha ACC/FDP	01/06/2025	01/06/2025	31/12/2025	31/12/2025

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Praha ACC/FDP	01/06/2025	01/06/2025	31/12/2025	31/12/2025

4.7. Denmark FF-ICE Release 1 Implementation Roadmap

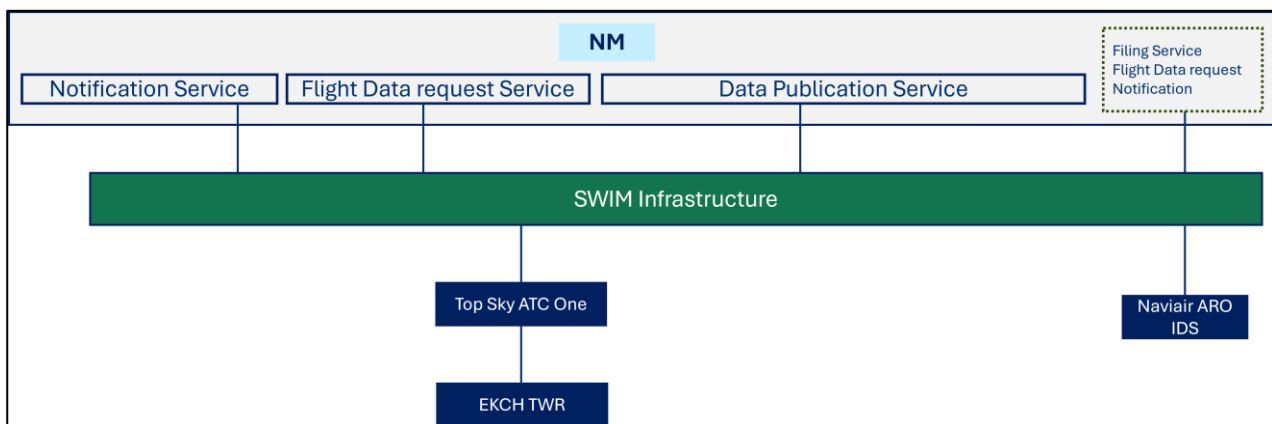
Introduction

Naviar is part of the COOPANS alliance who recently signed a new contract with Thales for a major system update implementing TopSky ATC ONE. Given the magnitude of the entire project and that implementation is taking place across 6 countries, it will be a stepwise implementation. Naviar is placed in the last implementation bracket, meaning operational use of the services is anticipated between 2027 and 2029. However, Naviar is currently implementing a SWIM gateway (NAVISWIM) estimated to become operational by the end of 2025 allowing Naviar to become partially compliant with the regulation from a connectivity perspective.

For the data publication service, the EKCH TWR A-SMGCS is owned and under the responsibility of Copenhagen Airport and will be connected to Naviar's FDP. Therefore, the upgrade of this system i.e to use the GUFU is dependent on Naviar's implementation of the upgraded COOPANS ATC One system planned for 2027-2029.

FF-ICE/R1 selected architecture approach

In the case of Denmark, the approach is covering all FF-ICE services, Flight Data Request, Notification and Data Publication Service. The FDP will be the source for all relevant information for the TWR systems, including the A-SMGCS.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Copenhagen ACC/FDP	?	?	31/12/2029	31/12/2029
NaviSWIM	31/12/2024	30/09/2025	31/12/2025	N/A
EKCH TWR	N/A	N/A	N/A	?
EKCH A-SMGCS	N/A	N/A	N/A	?

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Copenhagen ACC/FDP	?	?	31/12/2029	31/12/2029
NaviSWIM	31/12/2024	30/09/2025	31/12/2025	N/A
EKCH TWR	N/A	N/A	N/A	?
EKCH A-SMGCS	N/A	N/A	N/A	?

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Copenhagen ACC/FDP	?	?	31/12/2029	05/12/2029
NaviSWIM	31/12/2024	30/09/2025	31/12/2025	N/A
EKCH TWR	N/A	N/A	N/A	?
EKCH A-SMGCS	N/A	N/A	N/A	?

4.8. Estonia FF-ICE Release 1 Implementation Roadmap

Introduction

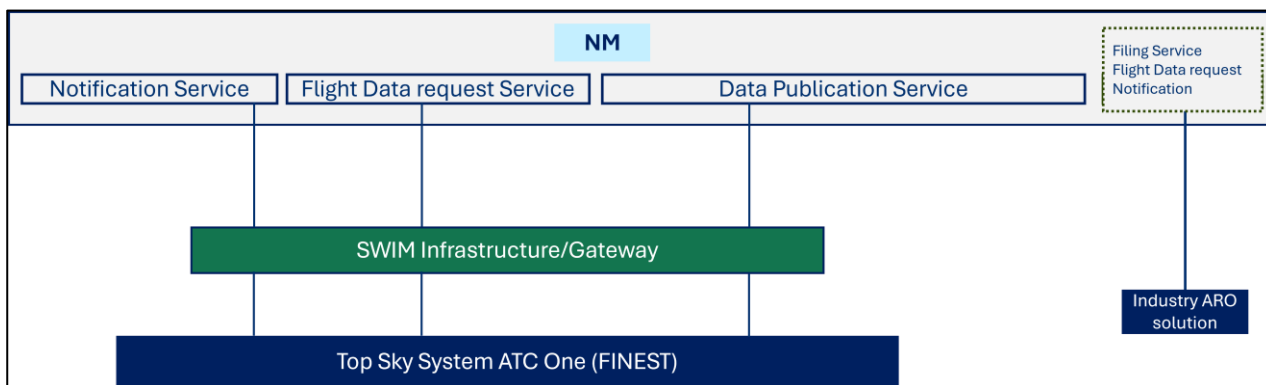
The planned implementation date for Estonia's three FF-ICE services is December 31, 2030, aligning with the upgrade of the ATM system. EANS is working closely with Fintraffic as part of the *Finest* collaboration, which aims to establish a single FDP serving two ACCs and managing the airspace of both Finland and Estonia. EANS plans to consume FF-ICE/R1 services through a SWIM Infrastructure/gateway layer acting as a SWIM gateway, rather than through a direct connection with NM.

EANS is not mandated to but plan to update the TWR system and is required to introduce a new Tower (TWR) system to facilitate the transition to the FF-ICE requirements. Since the TWR systems receive their input from the Flight Data Processing (FDP) system, the implementation timeline for the new TWR system will align with that of the FDP's new system deployment.

Regarding ARO FF-ICE implementation, EANS currently uses Frequentis as its provider, which is committed to delivering a CP1 FF-ICE-compliant solution. While EANS initially aimed for implementation by 2025, the complexity of the process may lead to delays.

FF-ICE/R1 selected architecture approach

In the case of Estonia, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Gateway/Broker	31/03/2029	30/06/2029	31/12/2029	N/A
Tallin ACC/FDP	N/A	N/A	N/A	31/12/2029

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Gateway/Broker	31/03/2029	30/06/2029	31/12/2029	N/A
Tallin ACC/FDP	N/A	N/A	N/A	31/12/2029

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Gateway/Broker	31/03/2029	30/06/2029	31/12/2029	N/A
Tallin ACC/FDP	N/A	N/A	N/A	31/12/2029

4.9. Finland FF-ICE Release 1 Implementation Roadmap

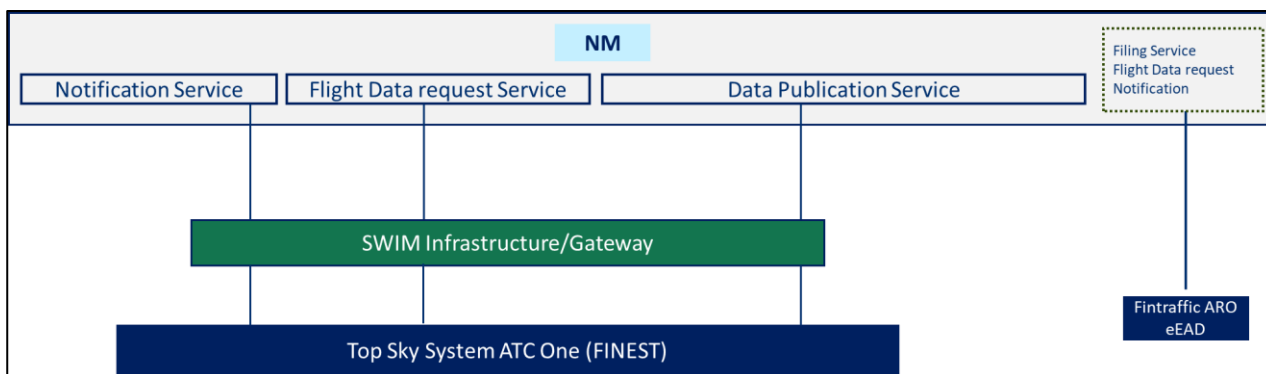
Introduction

Fintraffic currently operates the TopSky ATC system from Thales but does not plan to upgrade it. Instead, negotiations are underway with Thales for a new ATC system, TopSky ATC One, which is expected to support and consume FF-ICE/R1 services by the end of 2029. Until then, system messages will continue to be exchanged via AFTN/AMHS.

As planned, the next-generation ATC system will serve as the FDP for both Estonia and Finland's ACCs as part of the *Finest* collaboration. Fintraffic ANS also plans to use a SWIM gateway to interface between its ATM system and FF-ICE/R1 NM B2B services while relying on eEAD for ARO capability updates.

FF-ICE/R1 selected architecture approach

In the case of Finland, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Helsinki ACC/FDP	31/03/2029	30/06/2029	31/12/2029	31/12/2029

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Helsinki ACC/FDP	31/03/2029	30/06/2029	31/12/2029	31/12/2029

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Helsinki ACC/FDP	31/03/2029	30/06/2029	31/12/2029	31/12/2029

4.10. France FF-ICE Release 1 Implementation Roadmap

Introduction

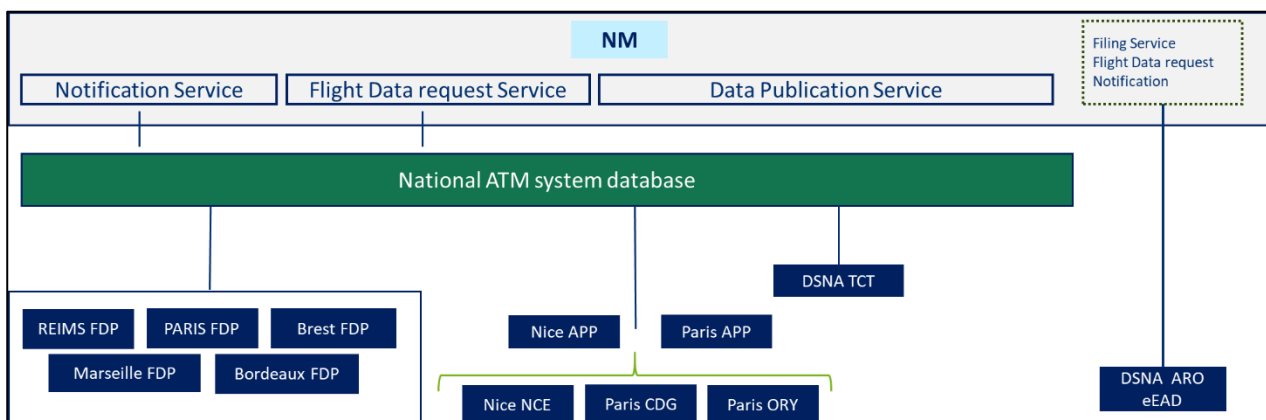
DSNA has begun planning and partially implementing FF-ICE. Following the recent deployment of the 4-FLIGHT ATC system in France, no new system is planned to meet CP1 requirements; instead, 4-FLIGHT will be updated accordingly. France's ATM environment remains complex, as separate CAUTRA systems are still used for approach control.

In summer 2022, successful FF-ICE communication tests were conducted between Coflight (the 4-FLIGHT flight plan system) and NM FF-ICE services. The results are currently under analysis to guide the industrialization process within the 4-FLIGHT roadmap. The planned implementation is set for 4-FLIGHT V4.1 in winter 2028-2029, following the full alignment of all French ACCs on 4-FLIGHT V4.0 by winter 2027-2028. This timeline will be fully confirmed by the end of 2025, hence concrete dates have been omitted from the tables below.

For the legacy CAUTRA system, NM's FF-ICE-to-FPL2012 translator will be used until 4-FLIGHT is fully deployed, ultimately consolidating ACC and approach control under a single system in France.

FF-ICE/R1 selected architecture approach

In the case of France, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Reims ACC/FDP	?	?	?	31/12/2029
Paris ACC/FDP	?	?	?	31/12/2029
LFPG TWR	?	?	?	31/12/2029
LFPG APP	?	?	?	31/12/2029
LFPO TWR	?	?	?	31/12/2029
LFPO APP	?	?	?	31/12/2029
Brest ACC/FDP	?	?	?	31/12/2029
Marseille ACC/FDP	?	?	?	31/12/2029
Bordeaux ACC/FDP	?	?	?	31/12/2029
LFMN TWR	?	?	?	31/12/2029
LFMN APP	?	?	?	31/12/2029

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Reims ACC/FDP	?	?	?	31/12/2029
Paris ACC/FDP	?	?	?	31/12/2029
LFPG TWR	?	?	?	31/12/2029
LFPG APP	?	?	?	31/12/2029
LFPO TWR	?	?	?	31/12/2029
LFPO APP	?	?	?	31/12/2029
Brest ACC/FDP	?	?	?	31/12/2029
Marseille ACC/FDP	?	?	?	31/12/2029

Bordeaux ACC/FDP	?	?	?	31/12/2029
LFMN TWR	?	?	?	31/12/2029
LFMN APP	?	?	?	

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Reims ACC/FDP	?	?	?	31/12/2029
Paris ACC/FDP	?	?	?	31/12/2029
LFPG TWR	?	?	?	31/12/2029
LFPG APP	?	?	?	31/12/2029
LFPO TWR	?	?	?	31/12/2029
LFPO APP	?	?	?	31/12/2029
Brest ACC/FDP	?	?	?	31/12/2029
Marseille ACC/FDP	?	?	?	31/12/2029
Bordeaux ACC/FDP	?	?	?	31/12/2029
LFMN TWR	?	?	?	31/12/2029
LFMN APP	?	?	?	31/12/2029

4.11. Germany FF-ICE Release 1 Implementation Roadmap

Introduction

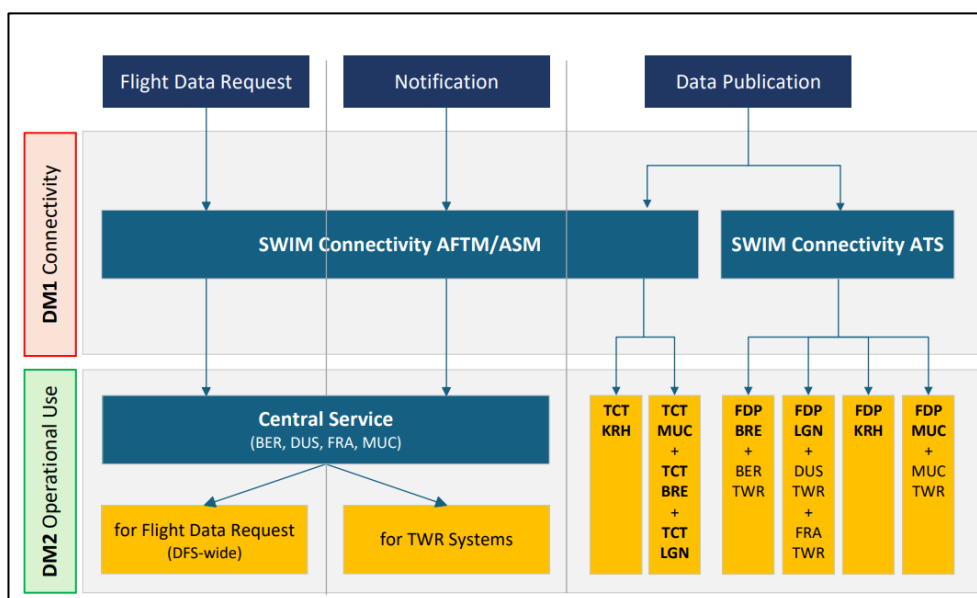
DFS is implementing FF-ICE through a phased approach. Extensive testing has already been conducted in PreOPS, and a CEF project is underway to upgrade traffic complexity tools (TCTs) within the ACCs, with the goal of bringing them into operation by December 31, 2025. The objective is to incorporate relevant eFPL information into trajectory calculations of the TCTs, in order to improve time- and location-based entry predictions for FIRs and ATC sectors.

Additionally, DFS is deploying SWIM Gateways to connect with NM B2B and consume FF-ICE services. All connections to NM will be handled exclusively through these gateways, ensuring a standardized and efficient interface. This will support the Notification Service for handling departure and arrival events through a centralized service, also planned to be operational at the end of 2025.

DFS will iteratively update its flight data processing systems, leveraging FF-ICE data to enhance operational efficiency. The plan is to provide the required functionality for the four ACCs in Germany starting in 2030, and enabling full FF-ICE implementation nationwide by 2032.

For ARO, DFS currently relies on EAD and will continue to use eEAD systems moving forward.

Germany FF-ICE/R1 selected architecture approach



FF-ICE/R1 Service deployment overview

Flight Data Request

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Connectivity AFTM/ASM	01/04/2025	01/08/2025	01/11/2025	N/A
EDDB TWR	N/A	N/A	N/A	19/12/2025
EDDF TWR	N/A	N/A	N/A	19/12/2025
EDDL TWR	N/A	N/A	N/A	19/12/2025
EDDM TWR	N/A	N/A	N/A	19/12/2025

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Connectivity AFTM/ASM	01/04/2025	01/08/2025	01/11/2025	N/A
EDDB TWR	N/A	N/A	N/A	19/12/2025

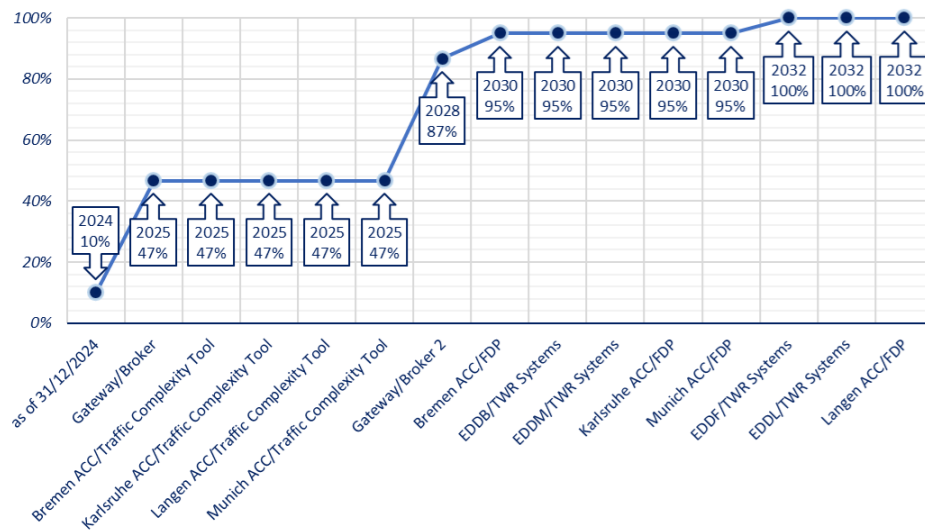
EDDF TWR	N/A	N/A	N/A	19/12/2025
EDDL TWR	N/A	N/A	N/A	19/12/2025
EDDM TWR	N/A	N/A	N/A	19/12/2025

Data Publication Service

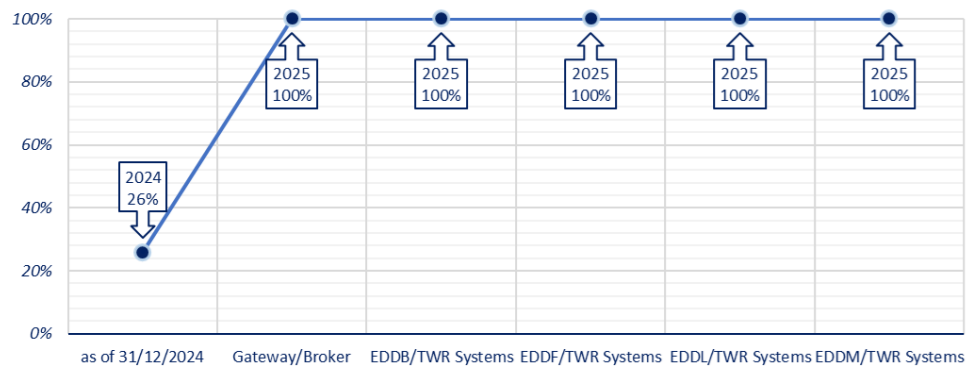
Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Connectivity ATFM/ASM	01/04/2025	01/08/2025	01/11/2025	N/A
Langen TCT	N/A	N/A	N/A	31/12/2025
Munich TCT	N/A	N/A	N/A	31/12/2025
Karlsruhe TCT	N/A	N/A	N/A	31/12/2025
Bremen TCT	N/A	N/A	N/A	31/12/2025
SWIM Connectivity ATS	?	?	31/12/2028	N/A
Langen ACC/FDP	N/A	N/A	N/A	31/12/2032
EDDF TWR	N/A	N/A	N/A	31/12/2032
EDDL TWR	N/A	N/A	N/A	31/12/2032
Munich ACC/FDP	N/A	N/A	N/A	31/12/2030
EDDM TWR	N/A	N/A	N/A	31/12/2030
Karlsruhe UAC	N/A	N/A	N/A	31/12/2030
Bremen ACC/FDP	N/A	N/A	N/A	31/12/2030
EDDB TWR	N/A	N/A	N/A	31/12/2030

Progress Status pr CP1 Regulatory deadline 31/12-2025

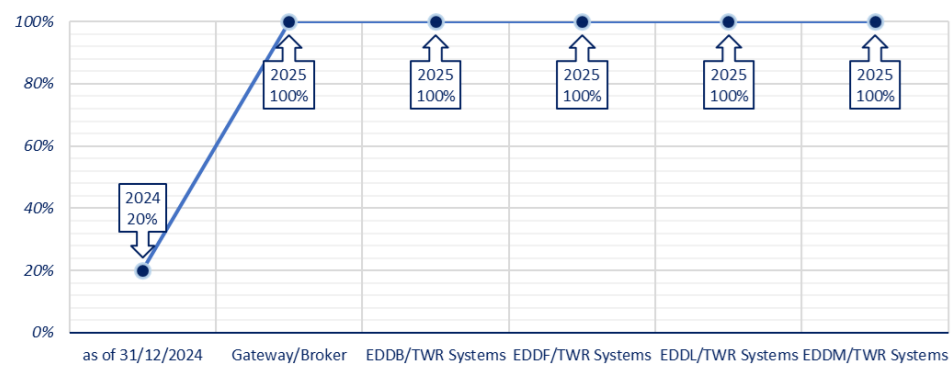
Publication service



Flight data request



Notification Service



4.12. Greece FF-ICE Release 1 Implementation Roadmap

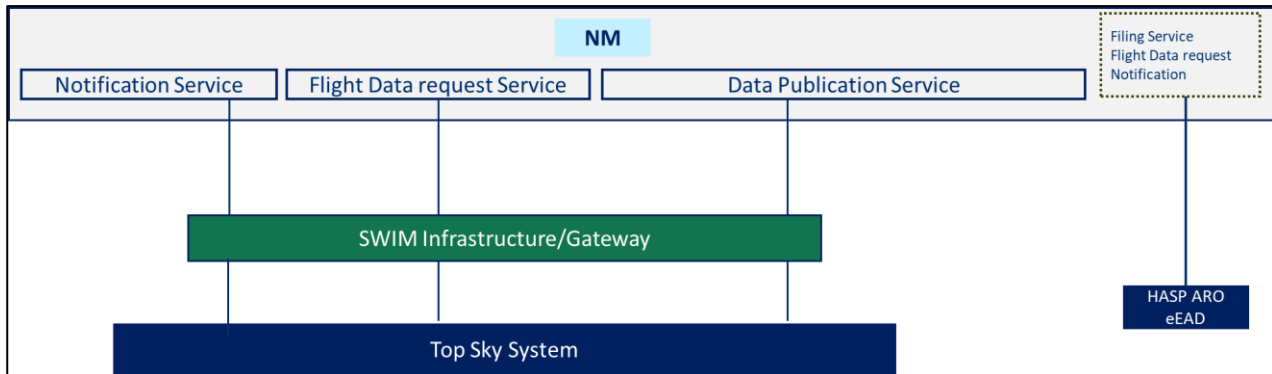
Introduction

HASP is currently in negotiations for the implementation of a new ATM system with their system provider THALES. It is anticipated that this new ATM system will be implemented by 2028. Although no contract has been signed yet, HASP anticipate this step to be completed within Q1/Q2 2025.

As a result, there is a lack of clarity relating to the deployment architecture of the FDP and through what means HASP will consume and use the FF-ICE/R1 services.

FF-ICE/R1 selected architecture approach

In the case of Greece, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Athinai ACC/FDP, Makedonia ACC/FDP	30/06/2028	?	31/12/2028	31/12/2028

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Athinai ACC/FDP, Makedonia ACC/FDP	30/06/2028	?	31/12/2028	31/12/2028

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Athinai ACC/FDP, Makedonia ACC/FDP	30/06/2028	?	31/12/2028	31/12/2028

4.13. Hungary FF-ICE Release 1 Implementation Roadmap

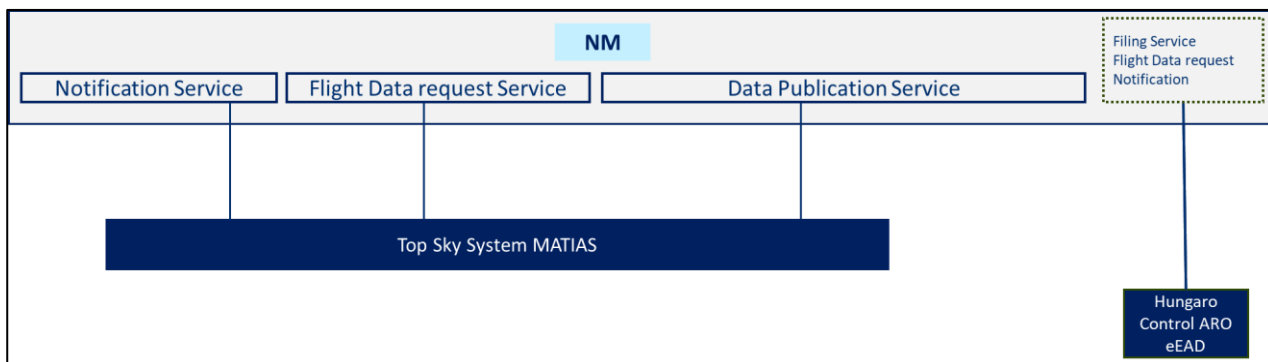
Introduction

HungaroControl's implementation of MATIAS Build 14 will unlock the capability for HungaroControl to consume the FF-ICE/R1 Data Publication, Notification, and Flight Data Request services. A contract has already been signed with system supplier Thales in this regard. HungaroControl is upgrading the ground systems in order to process and receive the eFPL and will also make operational use of it.

HungaroControl plans to establish a direct connection between its FDP and the FF-ICE/R1 NM B2B services, allowing these services to be consumed without the use of a gateway. However, there is some uncertainty regarding the long-term implementation, as HungaroControl is considering both an upgrade to its current Matias system and the potential adoption of Thales' latest TopSky ATC One system.

FF-ICE/R1 selected architecture approach

In the case of Hungary, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Budapest ACC/FDP	30/09/2028	31/10/2028	30/11/2028	31/12/2028

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Budapest ACC/FDP	30/09/2028	31/10/2028	30/11/2028	31/12/2028

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Budapest ACC/FDP	30/09/2028	31/10/2028	30/11/2028	31/12/2028

4.14. Ireland FF-ICE Release 1 Implementation Roadmap

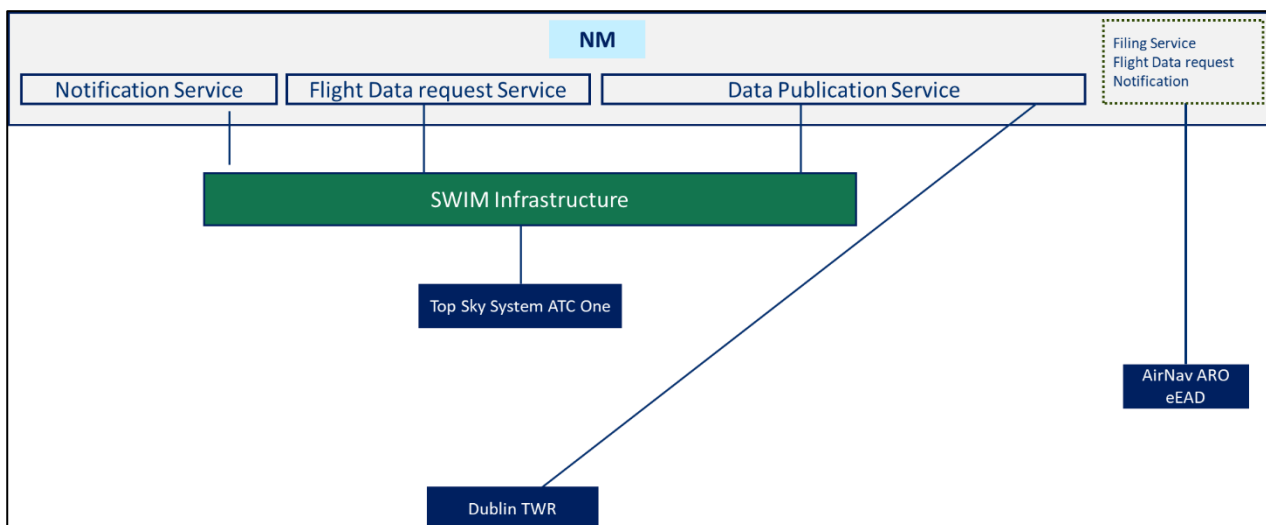
Introduction

AirNav Ireland is part of the COOPANS alliance who recently signed a contract for a major system update moving to the TopSky ATC One from Thales. Presently, there are no plans to consume NM FF-ICE/R1 formats in the COOPANS Legacy System for 2025. Native processing of NM FF-ICE/R1 will be implemented in next the Generation ATM system in 2029.

AirNav Ireland operates distinct TWR and ACC systems. It is anticipated that AirNav's ATM system will consume the FF-ICE/R1 services via a SWIM infrastructure layer acting as a gateway. The TWR system (iATS) will consume the NM B2B data publication services directly, enabling full compliance with FF-ICE for the TWR system earlier than the FDP already in Q2 2026.

FF-ICE/R1 selected architecture approach

In the case of Ireland, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Dublin ACC/FDP	Q2 2026	30/09/2026	31/12/2029	31/12/2029
Shannon ACC/FDP	Q2 2026	30/09/2026	31/12/2029	31/12/2029
EIDW TWR	Q1 2026	30/06/2026	31/12/2026	31/12/2026

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Dublin ACC/FDP	Q2 2026	30/09/2026	31/12/2029	31/12/2029
Shannon ACC/FDP	Q2 2026	30/09/2026	31/12/2029	31/12/2029
EIDW TWR	Q1 2026	30/06/2026	31/12/2026	31/12/2026

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Dublin ACC/FDP	Q2 2026	30/09/2026	31/12/2029	31/12/2029
Shannon ACC/FDP	Q2 2026	30/09/2026	31/12/2029	31/12/2029
EIDW TWR	Q1 2026	30/06/2026	31/12/2026	31/12/2026

Planned rollout for the TWR system is planned for Q2-2026 and NM testing will be scheduled to align with this deployment.

4.15. Italy FF-ICE Release 1 Implementation Roadmap

Introduction

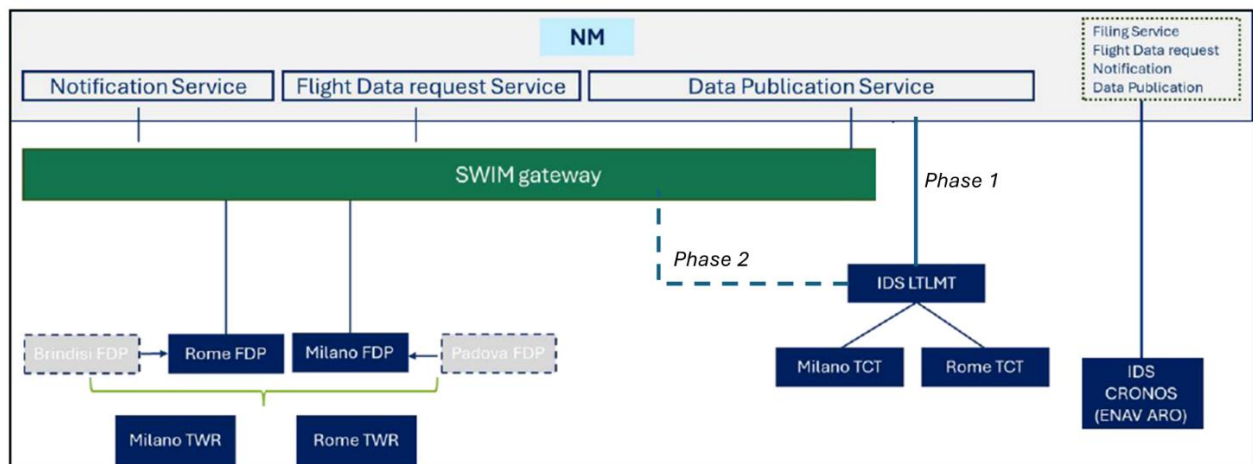
Italy currently has four ACCs—Rome, Milan, Brindisi, and Padua—all mandated to comply with the CP1 regulation. However, Brindisi is already undergoing a transition to become a Remote Tower Control Center (RTCC), and there are long-term plans for Padua to follow, though without concrete timelines. As a result, Italy's overall ATM system architecture is evolving, and ENAV has made a strategic decision to limit upgrades to Brindisi and Padua ACCs to only what is strictly necessary. Consequently, FF-ICE will be implemented solely in the Rome and Milan ACCs.

To support this transition, ENAV has developed a software layer capable of connecting to the NM FF-ICE service and exchanging information in accordance with the SWIM Yellow Profile (YP) specification. ENAV plans to integrate this FF-ICE/R1 service from NM, ensuring the incorporation of relevant eFPL data into operational ATM systems, including ATC systems, with a dedicated service usage plan in place. Both CRONOS (ENAV ARO) and LTLMT (Traffic Complexity Tool) systems will connect directly in an initial stage, with the intention of eventually connecting them via the SWIM gateway.

In 2024, work began on specifying a component to facilitate the exchange of eFPL data with ATC systems. Connectivity is expected to be established by the end of 2025, with full integration into the new FDP system by 2028. This implementation follows the FF-ICE roadmap, which has been coordinated at the European level with other relevant stakeholders.

FF-ICE/R1 selected architecture approach

In the case of Italy, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Gateway	?	?	31/12/2025	N/A
Milano ACC/FDP	N/A	N/A	N/A	31/12/2028
Milano ACC/TCT	N/A	N/A	N/A	31/12/2026
LIMC TWR	N/A	N/A	N/A	31/12/2028
Roma ACC/FDP	N/A	N/A	N/A	31/12/2028
Roma ACC/TCT	N/A	N/A	N/A	31/12/2026
LIRF TWR	N/A	N/A	N/A	31/12/2028

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Gateway	?	?	31/12/2025	N/A

Milano ACC/FDP	N/A	N/A	N/A	31/12/2028
Roma ACC/FDP	N/A	N/A	N/A	31/12/2028

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Gateway	?	?	31/12/2025	N/A
Milano ACC/FDP	N/A	N/A	N/A	31/12/2028
Milano ACC/TCT	N/A	N/A	N/A	31/12/2026
LIMC TWR	N/A	N/A	N/A	31/12/2028
Roma ACC/FDP	N/A	N/A	N/A	31/12/2028
Roma ACC/TCT	N/A	N/A	N/A	31/12/2026
LIRF TWR	N/A	N/A	N/A	31/12/2028

4.16. Latvia FF-ICE Release 1 Implementation Roadmap

Introduction

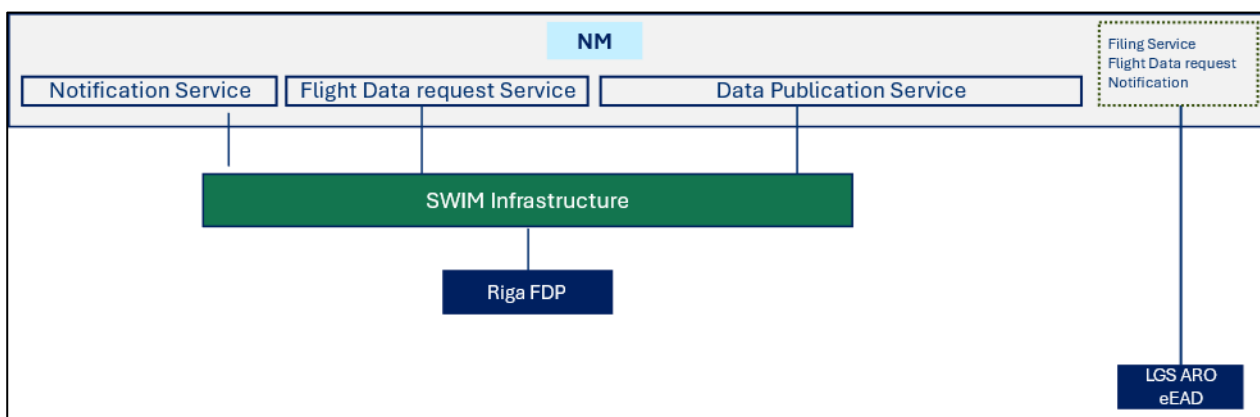
LGS plans to implement FF-ICE/R1 services through a phased approach, with the first step set for completion by the December 31, 2027. This initial phase will involve updating the controller support system (ARO and ATFM unit support) to utilize FF-ICE/R1 mandatory services. This first block of ATC support systems, referred to as 'Module N1', is a legacy component of the existing ATM system.

As a part of the modernization process, Module N1 will then be substituted with a newly developed local SWIM platform, which will also serve as a foundation for the future ATM system. The N1 module functionalities will also be integrated into this new ATM system. FF-ICE/R1 services, provided as SWIM services, will also be fully implemented in the new ATM system, which is expected to be procured and operational by the end of 2029. The new ATC system will be designed to natively process eFPLs.

LGS will consume FF-ICE/R1 services using the local SWIM platform, which will be connected to iNM, eEAD and other SWIM stakeholders. For ARO operations, LGS will use the eEAD system up until the point that the local ARO application is able to be FF-ICE/R1 and SWIM compliant, which is also planned for the end of 2027.

FF-ICE/R1 selected architecture approach

In the case of Latvia, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
N1 module	01/06/2026	10/01/2027	01/06/2027	31/12/2027
Riga ACC/FDP	?	?	31/12/2029	31/12/2029

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
N1 module	01/06/2026	10/01/2027	01/06/2027	31/12/2027
Riga ACC/FDP	?	?	31/12/2029	31/12/2029

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
N1 module	01/06/2026	10/01/2027	01/06/2027	31/12/2027
Riga ACC/FDP	?	?	31/12/2029	31/12/2029

4.17. Lithuania FF-ICE Release 1 Implementation Roadmap

Introduction

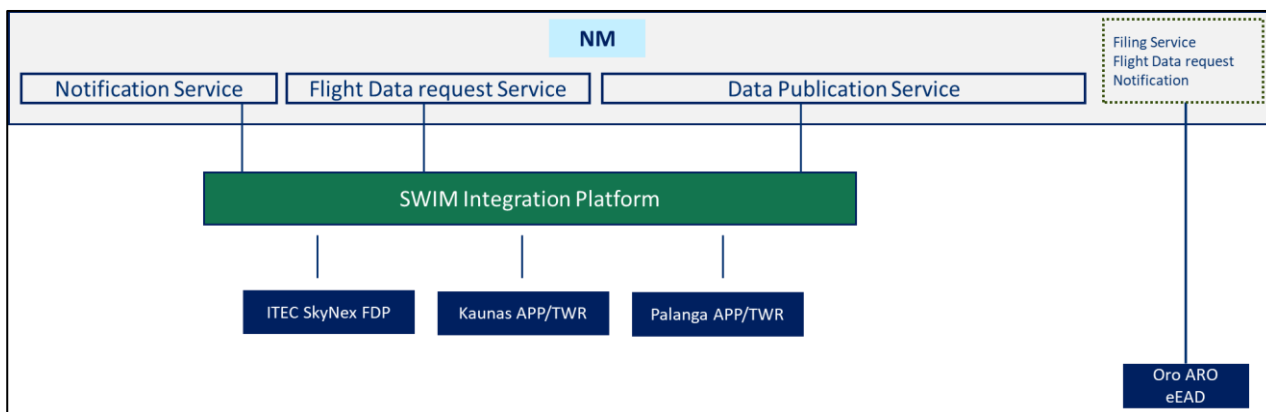
The FF-ICE/R1 functionalities will be partially implemented by 2025, but full operational deployment is expected beyond the CP1 deadline, with completion planned for 2032.

Oro Navigacija's current ATC system (iTEC v2, deployed in 2021) does not support FF-ICE features. To address this, a new system (iTEC SkyNex) is being developed and will be deployed in three phases, following the SkyNex system deployment roadmap agreed upon by iTEC members and Indra, with full implementation targeted for 2032.

Oro Navigacija plans to consume FF-ICE/R1 services through an integrated SWIM platform, which will independently connect both the FDP and TWR systems. The expansion of this SWIM integration platform will begin in 2025, ensuring full operational capability for eFPL processing in both TWR and ACC systems by 2032. While Oro Navigacija will establish full connectivity with NM and start consuming FF-ICE services by 2025, integration into the main ATC system will only be realized as part of the iTEC SkyNex rollout under the broader iTEC collaboration.

FF-ICE/R1 selected architecture approach

In the case of Lithuania, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM integration platform	?	?	30/06/2025	N/A
Vilnius ACC/FDP	N/A	N/A	N/A	31/12/2032

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM integration platform	?	?	30/06/2025	N/A
Vilnius ACC/FDP	N/A	N/A	N/A	30/12/2032

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM integration platform	?	?	30/06/2025	N/A
Vilnius ACC/FDP	N/A	N/A	N/A	30/12/2032

TWR-Systems

Lithuania is not mandated to change their TWR systems according to CP1 FF-ICE/R1 requirements. TMA systems are used in TWR WP.

4.18. Malta FF-ICE Release 1 Implementation Roadmap

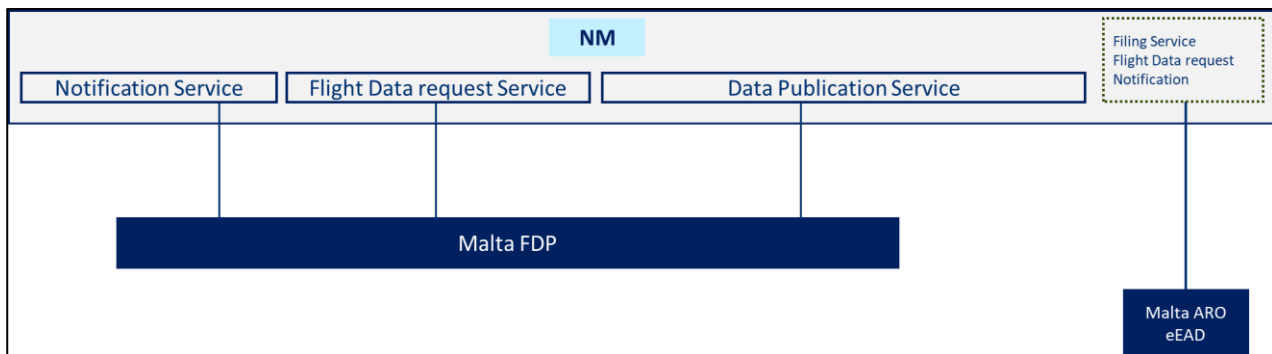
Introduction

Based on information provided in bilateral meetings with MATS, to consume the FF-ICE SWIM services, the need to implement changes to their ATM system has been identified. This will be through either an upgrade to their existing system, or via the launch of a procurement activity for a new ATM system.

Currently, a decision on which of these two options to go with is yet to be made, however this is expected in the near future. The architecture deployment overview is therefore not yet clear due to the dependencies related to the upgrade of the current ATM system, or the procurement of a new one. For ARO, Malta will rely on the eEAD.

FF-ICE/R1 selected architecture approach

In the case of Malta, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Malta ACC/FDP	?	?	31/12/2026	31/12/2026

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Malta ACC/FDP	?	?	31/12/2026	31/12/2026

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Malta ACC/FDP	?	?	?	?

4.19. MUAC FF-ICE Release 1 Implementation Roadmap

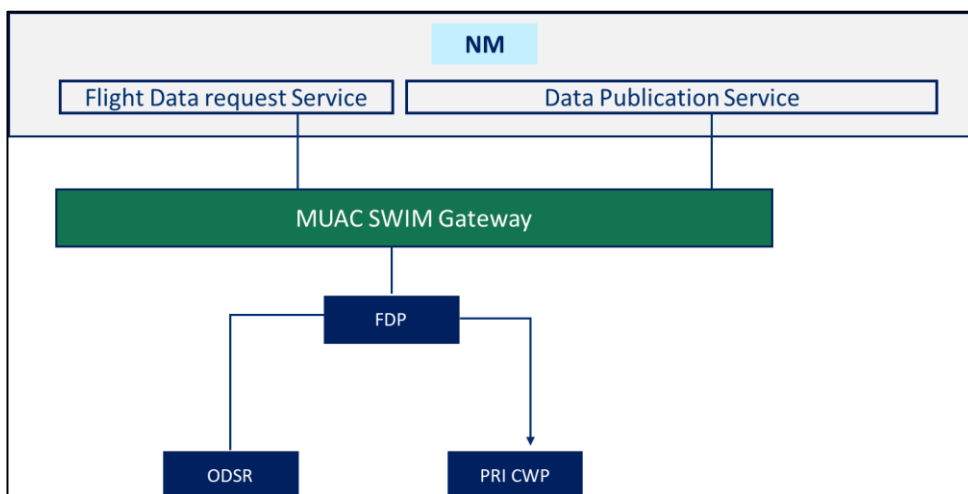
Introduction

MUAC will use a SWIM gateway to consume eFPLs from the Data Publication and Flight Data Request services. The responsibility of the gateway is limited to external communication with NM and transferring communications internally to the FDP. eFPLs sent from the SWIM gateway will be directed to the FDP and consumed natively, with the FDP processing the FIXM format without any conversion. The FDP will then then publish this information to the Primary CWP for ATCOs to work with.

The OSDR, which is MUAC's support screen will also consume eFPLs, in two different modes. In the first mode, the FDP will forward data it has processed to the OSDR. Secondly, however, the OSDR can also consume the eFPL directly from the SWIM Gateway for visualisation purposes only, allowing the ATCO to view the 4D profile of the flight. This mode of consumption ensures a level of redundancy, allowing the OSDR to act as a fallback in the event of a failure of the Primary CWP, and allowing ATCOs to maintain some visibility of the aircraft's intentions based on this 4D profile provided through the native eFPL consumption.

FF-ICE/R1 selected architecture approach

In the case of MUAC, the approach is covering the following FF-ICE services; Flight Data Request and Data Publication Service. The Notification service is not applicable for MUAC as they only cover upper airspace above FL245.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Maastricht UAC/FDP	31/01/2026	31/01/2026	31/12/2026	31/12/2026

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Maastricht UAC/FDP	31/01/2026	31/01/2026	31/12/2026	31/12/2026

4.20. Netherlands FF-ICE Implementation Roadmap

Introduction

LVNL will upgrade its systems to be capable of receiving and processing eFPLs distributed by the NM FF-ICE/R1 Publication Service, in addition to ICAO 2012 FPLs, as well as consume the Notification and Flight Data Request services.

As an intermediary step, in 2023 LVNL initiated a project called Flight Data Services (FDS) as a replacement of their Home Briefing System and Aeronautical Data Access System. This system will consist of a service supporting receiving, creating, (re)transmit, processing, storage and search of ATS messages and flight data (flight plans) initially via AFTN and in a second phase connect to NM SWIM FF-ICE/R1 B2B Services estimated at the end of 2026, serving the same function.

In parallel LVNL will continue working on the rollout of the iCAS ATM system. The current software version of this system does not support communication with a SWIM service. The FF-ICE development is part of iTEC SkyNex, so the availability of the software required to use the FF-ICE/R1 SWIM services is subject to its planning.

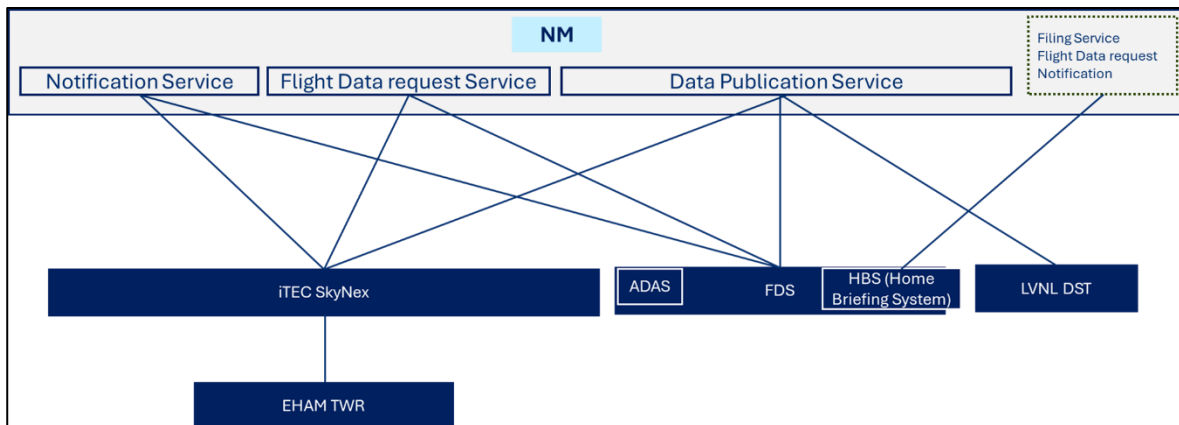
LVNL is still investigating when this information can be sent via a SWIM service by the new air traffic control system iCAS and whether a temporary solution is feasible in the meantime. The planned implementation date is therefore still uncertain.

LVNL plan to use the Data Publication Service for the Traffic Complexity Tool (LVNL DST – Decision Support Tool). This system will consume the eFPLs directly from NM via the Data Publication Service and will be operational in Q4 2026.

In the planned system architecture, after upgrading of iCAS to iTEC SkyNex, the FDP system will provide the connection to the Flight Data Request and Data Publication service and transmit the relevant data internally to the tower system for Schiphol Airport.

FF-ICE/R1 selected architecture approach

In the case of the Netherlands, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Amsterdam ACC/FDP	01/03/2031	01/05/2031	30/06/2031	31/12/2031
Amsterdam ACC/FDS	01/05/2026	01/06/2026	30/06/2026	31/12/2026
EHAM TWR	N/A	N/A	N/A	31/12/2031

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Amsterdam ACC/FDP	01/03/2031	01/05/2031	30/06/2031	31/12/2031

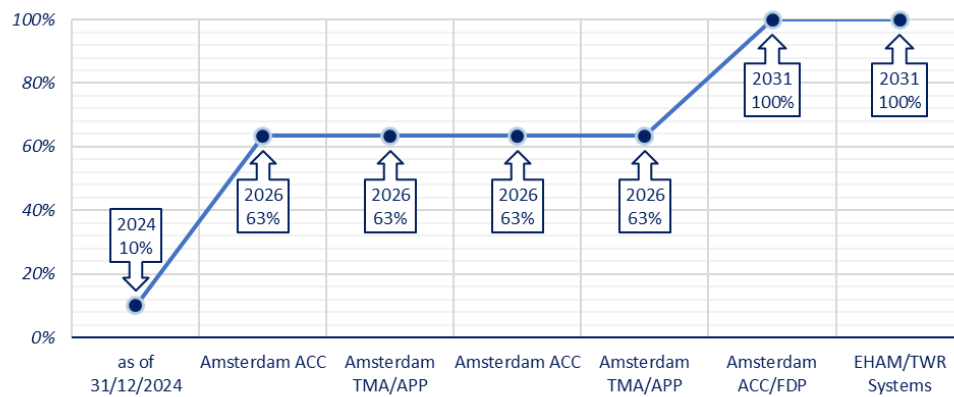
Amsterdam ACC/FDS	01/05/2026	01/06/2026	30/06/2026	31/12/2026
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Data Publication Service

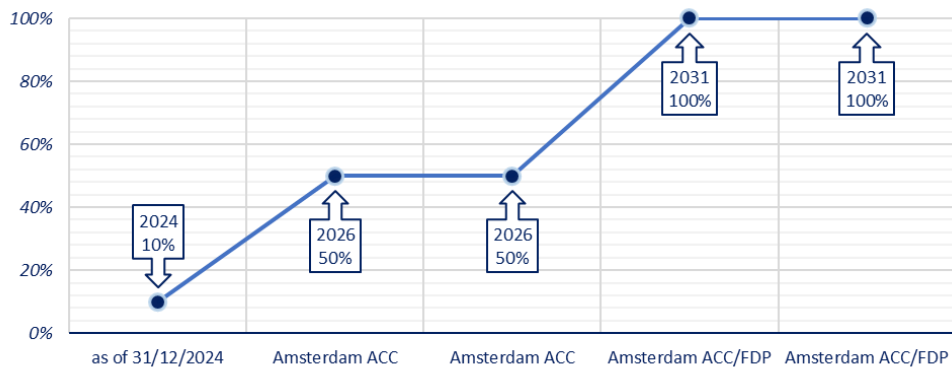
Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Amsterdam ACC/FDP	01/03/2031	01/05/2031	30/06/2031	31/12/2031
Amsterdam ACC/ Traffic Complexity System	01/10/2026	01/11/2026	31/12/2026	31/12/2026
Amsterdam ACC/FDS	01/05/2026	01/06/2026	30/06/2026	31/12/2026
EHAM TWR	N/A	N/A	N/A	31/12/2031

Status per CP1 Regulatory deadline 31/12-2025

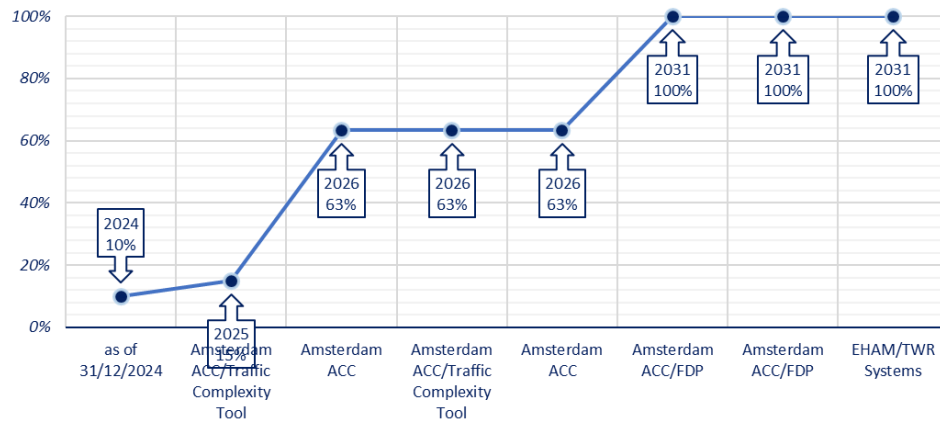
Flight data request



Notification Service



Publication service



4.21. Poland FF-ICE Release 1 Implementation Roadmap

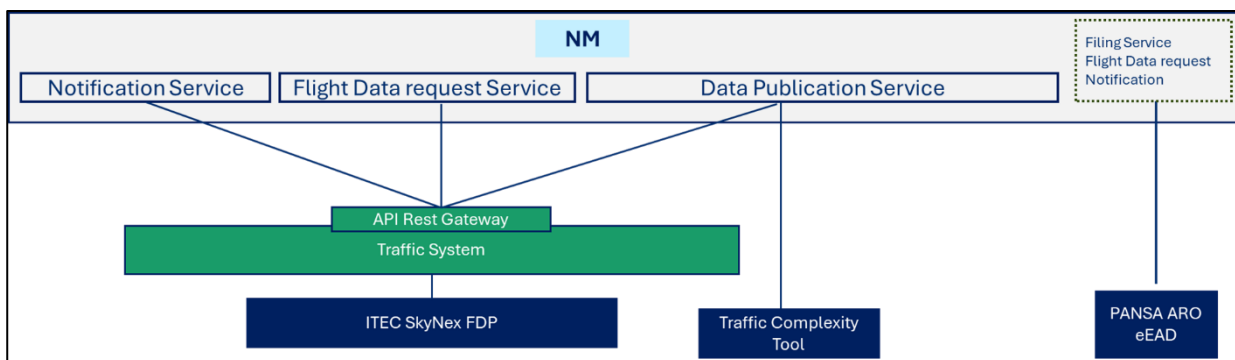
Introduction

PANSA can accommodate a partial completion of the full set of FF-ICE requirements by 2025 in the TRAFFIC (Track Advisor for Flight Information Concerns) system. This serves as a tool used to validate and verify the operational data as flight plans.

The full compliance regarding FF-ICE requirements will be achieved through the deployment of the new ATM system (iTEC), expected around 2032. The new ATM system will consume FF-ICE information via the TRAFFIC system acting as a gateway. TCT will directly connect with Data Publication Service and use only that Service.

FF-ICE/R1 selected architecture approach

In the case of Poland, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
TRAFFIC System Gateway/Broker	30/06/2025	30/09/2025	30/11/2025	31/12/2025
Warszawa ACC/FDP	N/A	N/A	N/A	31/12/2032

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
TRAFFIC System Gateway/Broker	30/06/2025	30/09/2025	30/11/2025	31/12/2025
Warszawa ACC/FDP	N/A	N/A	N/A	31/12/2032

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Warszawa ACC/FDP	N/A	N/A	N/A	31/12/2032
Warszawa ACC/Traffic Complexity Tool	?	?	?	31/12/2032
TRAFFIC System Gateway/Broker	30/06/2025	30/09/2025	30/11/2025	31/12/2025

4.22. Portugal FF-ICE Release 1 Implementation Roadmap

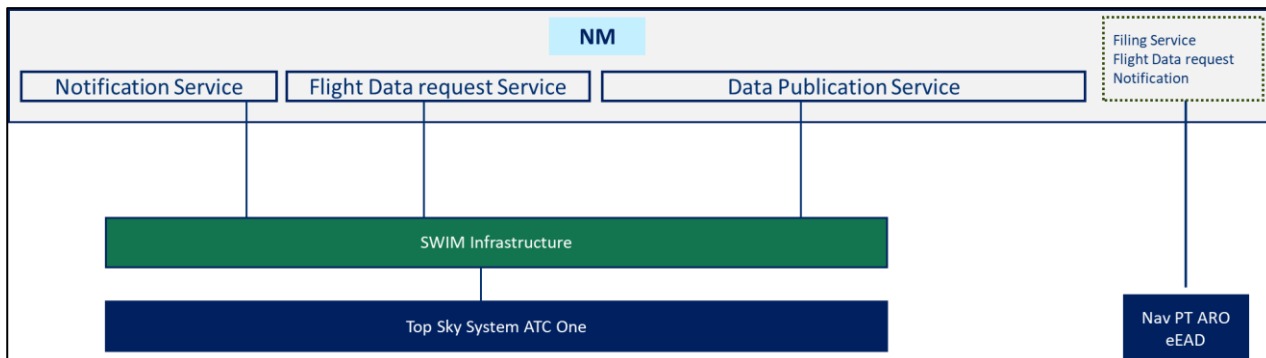
Introduction

Aligned with the other COOPANS members, there are no plans for NAV Portugal to consume NM FF-ICE/R1 formats in the COOPANS Legacy System for 2025. Native processing of NM FF-ICE/R1 will be implemented in next Generation TopSky ATC One ATM system in 2030.

NAV Portugal plans to consume FF-ICE/R1 services through a SWIM Infrastructure layer acting as a SWIM gateway, rather than through a direct connection with NM.

FF-ICE/R1 selected architecture approach

In the case of Portugal, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Lisboa ACC/FDP	28/02/2030	15/03/2030	25/03/2030	31/03/2030

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Lisboa ACC/FDP	28/02/2030	15/03/2030	25/03/2030	31/03/2030

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Lisboa ACC/FDP	31/12/2029	31/12/2029	31/12/2029	31/03/2030

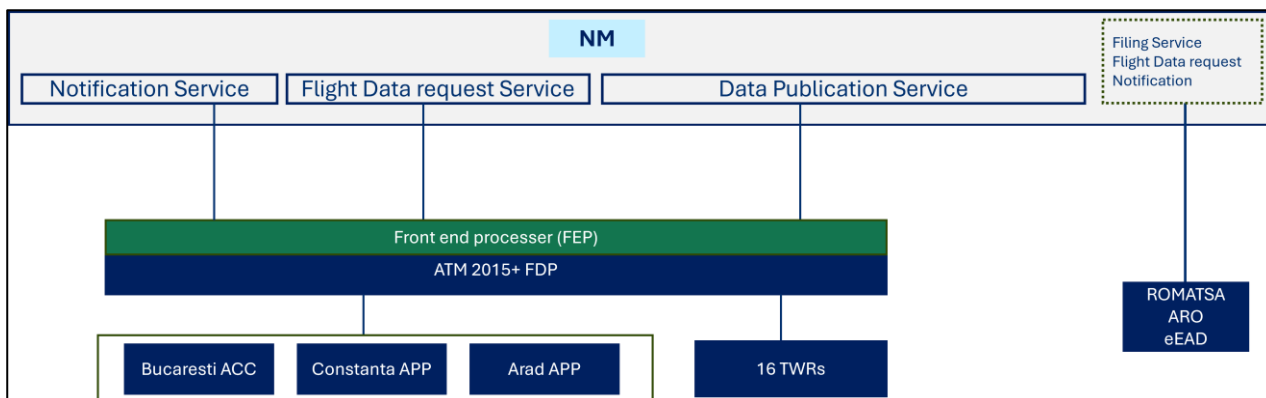
4.23. Romania FF-ICE Release 1 Implementation Roadmap

Introduction

ROMATSA have had a new ATM system in operation since 2019. To enable the consumption of FF-ICE/R1 services, ROMATSA are integrating an FEP (Front End Processor) module with this ATM system. This FEP is a dedicated interface deployed between the NM IFPS and ROMATSA's FDP, allowing the data filtering and protocol/format transformations required to support the provision of FF-ICE data.

FF-ICE/R1 selected architecture approach

In the case of Romania, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bucuresti ACC/FF-ICE FEP	28/03/2025	25/08/2025	31/12/2025	N/A
Bucuresti ACC/FDP	N/A	N/A	N/A	31/12/2025

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bucuresti ACC/FF-ICE FEP	28/03/2025	25/08/2025	31/12/2025	N/A
Bucuresti ACC/FDP	N/A	N/A	N/A	31/12/2025

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bucuresti ACC/FF-ICE FEP	28/03/2025	25/08/2025	31/12/2025	N/A
Bucuresti ACC/FDP	N/A	N/A	N/A	31/12/2025

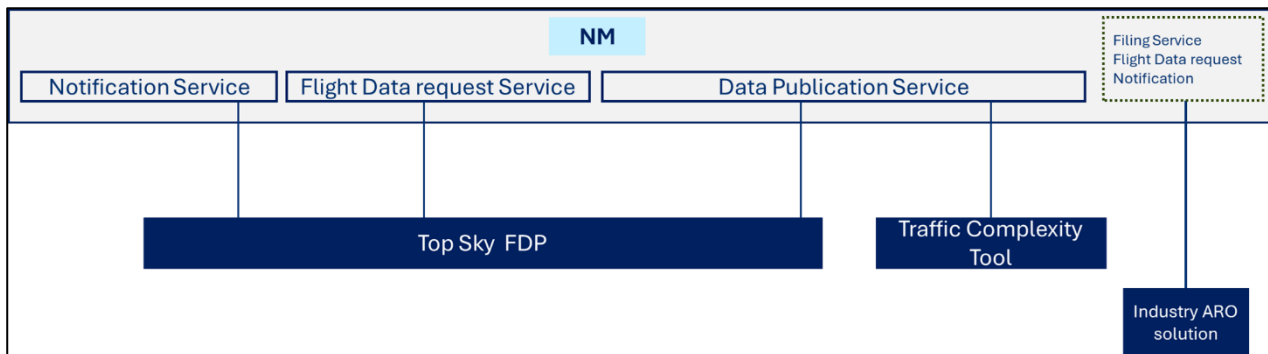
4.24. Slovakia FF-ICE Release 1 Implementation Roadmap

Introduction

Implementation of FF-ICE/R1 is part of a major system upgrade for Slovakia, which will be achieved in early 2030. In terms of architecture, Slovakia will consume the FF-ICE/R1 services directly from NM, instead of via a SWIM gateway. They will also use a traffic complexity tool which will also have a direct connection to the NM FF-ICE/R1 services.

FF-ICE/R1 selected architecture approach

In the case of Slovakia, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bratislava ACC/FDP	?	?	30/09/2029	30/03/2030

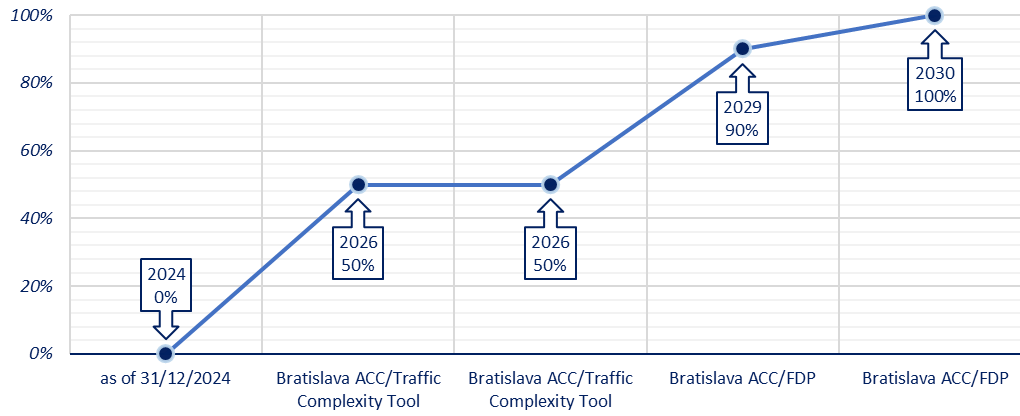
Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bratislava ACC/FDP	?	?	30/09/2029	30/03/2030

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bratislava ACC/FDP	?	?	30/09/2029	30/03/2030
Bratislava ACC/Traffic Complexity Tool	01/05/2025	01/09/2025	01/03/2026	30/09/2026

Status pr CP1 Regulatory deadline 31/12-2025 for the Publication service



4.25. Slovenia FF-ICE Release 1 Implementation Roadmap

Introduction

Slovenia Control develop their own FDPS in-house. When making previous architecture decisions relating to ADEXP, consumption of FF-ICE/R1 services via SWIM was therefore anticipated.

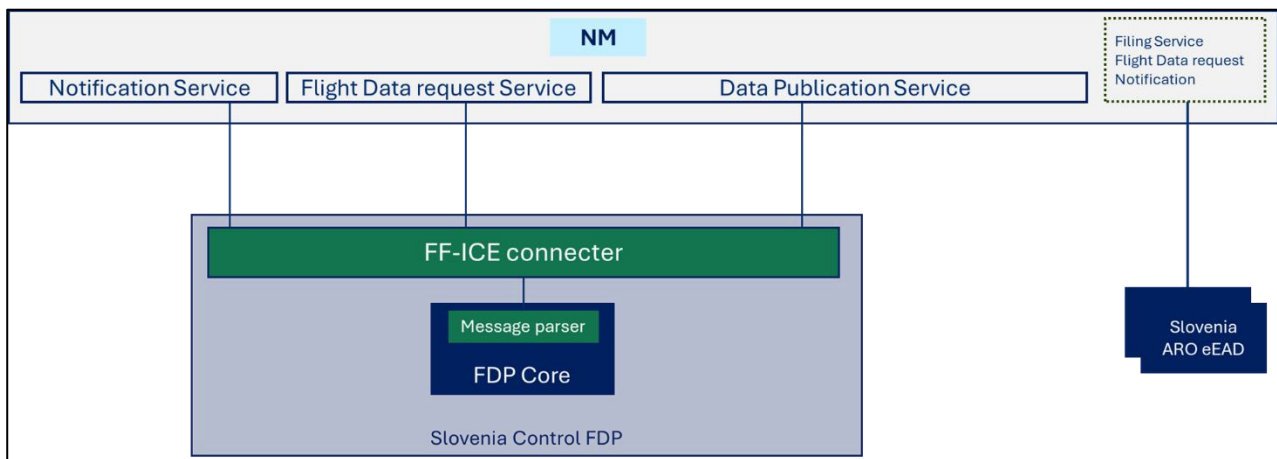
Slovenia Control are starting with the internal development of B2B connection module (FF-ICE connector), serving as a library which will allow to exchange data between any SWIM services (FIXM structure) and SCL systems. The library settings will then define which data is going to which system.

In addition, Slovenia Control's FDP core contains a message parser module, which is able to consume the FF-ICE data in FIXM format, and then extract the information in an internal message structure, to then be fed into the FDPS core.

Correspondingly, Slovenia will have full operational use of the FF-ICE/R1 Data Publication, Flight Data Request, and Notification Services by the end of 2025, ensuring compliance by the CP1 deadline.

FF-ICE/R1 selected architecture approach

In the case of Slovenia, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
FF-ICE Connector (Library)	10/06/2023	01/03/2025	31/10/2025	N/A
Ljubljana ACC/FDP	10/06/2023	01/03/2025	30/10/2025	31/12/2025

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
FF-ICE Connector (Library)	10/06/2023	01/03/2025	31/10/2025	N/A
Ljubljana ACC/FDP	10/06/2023	01/03/2025	30/10/2025	31/12/2025

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
FF-ICE Connector (Library)	10/06/2023	01/03/2025	31/10/2025	N/A
Ljubljana ACC/FDP	10/06/2023	01/03/2025	30/10/2025	31/12/2025

4.26. Spain FF-ICE Release 1 Implementation Roadmap

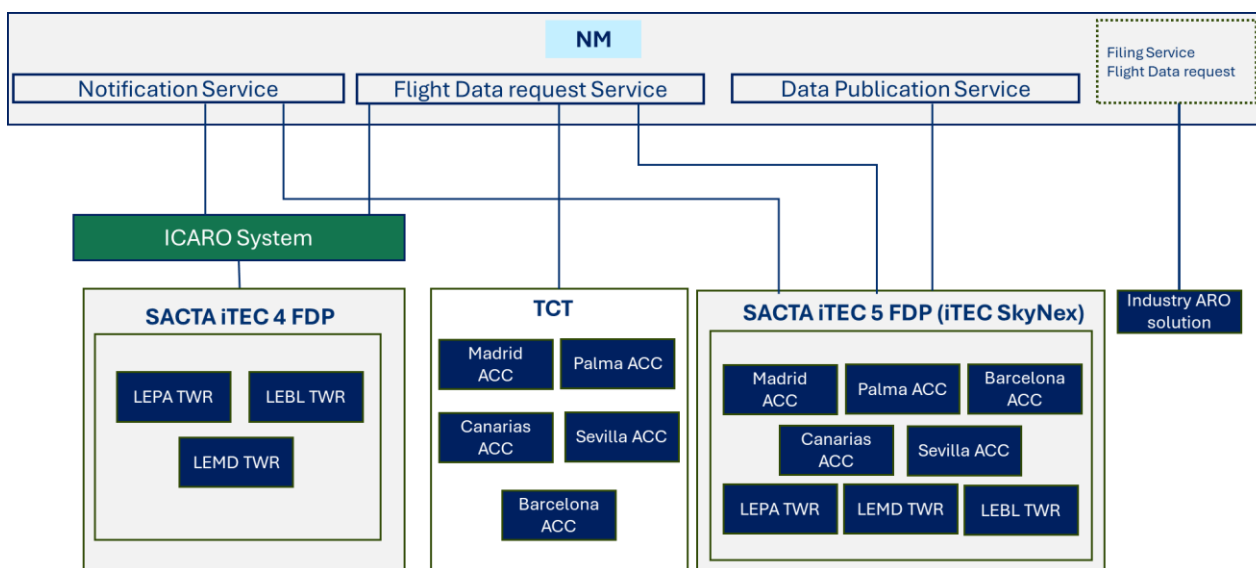
Introduction

To begin with, Spain will begin using the Flight Data Request and Notification Services for their 3 in-scope TWRs (LEPA, LEBL, and LEMD) at the end of 2025. This will be enabled through their ICARO system, via which the SACTA iTEC 4 FDP used by the TWRs will consume and use the services.

Meanwhile, the remaining systems – the TCT, and the ACC FDPs will consume the services directly from NM, utilising the new iTEC SkyNex system to be implemented in 2029. It is anticipated that implementation of SkyNex will take place in parallel across all sites, meaning operational use should be achieved at a similar time for all ACCs. The TWRs will also shift to this way of consumption/use upon deployment of the new iTEC SkyNex system.

FF-ICE/R1 selected architecture approach

In the case of Spain, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
ICARO	?	30/09/2025	31/12/2025	31/12/2025
LEBL TWR	N/A	N/A	N/A	31/12/2025
LEMD TWR	N/A	N/A	N/A	31/12/2025
LEPA TWR	N/A	N/A	N/A	31/12/2025

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
ICARO	?	30/09/2025	31/12/2025	31/12/2025
LEBL TWR	N/A	N/A	N/A	31/12/2025
LEMD TWR	N/A	N/A	N/A	31/12/2025
LEPA TWR	N/A	N/A	N/A	31/12/2025

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Barcelona ACC/FDP	?	30/09/2029	31/12/2029	31/12/2029
Canarias ACC/FDP	?	30/09/2029	31/12/2029	31/12/2029
Madrid ACC/FDP	?	30/09/2029	31/12/2029	31/12/2029
Palma ACC/FDP	?	30/09/2029	31/12/2029	31/12/2029
Sevilla ACC/FDP	?	30/09/2029	31/12/2029	31/12/2029
LEBL TWR	?	30/09/2029	31/12/2029	31/12/2029
LEMD TWR	?	30/09/2029	31/12/2029	31/12/2029
LEPA TWR	?	30/09/2029	31/12/2029	31/12/2029
Barcelona ACC/Traffic Complexity Tool	?	30/09/2029	31/12/2029	31/12/2029
Canarias ACC/Traffic Complexity Tool	?	30/09/2029	31/12/2029	31/12/2029
Madrid ACC/Traffic Complexity Tool	?	30/09/2029	31/12/2029	31/12/2029
Palma ACC/Traffic Complexity Tool	?	30/09/2029	31/12/2029	31/12/2029
Sevilla ACC/Traffic Complexity Tool	?	30/09/2029	31/12/2029	31/12/2029

4.27. Sweden FF-ICE Release 1 Implementation Roadmap

Introduction

As a member of the COOPANS alliance, LFV are aligned with the other COOPANS members in terms of FF-ICE/R1 implementation. Consequently, there are no plans to consume NM FF-ICE/R1 formats in their current ATM system (TopSky) for 2025. In alignment with the COOPANS ATC One roadmap, consumption and use of the FF-ICE/R1 services is anticipated for 2029.

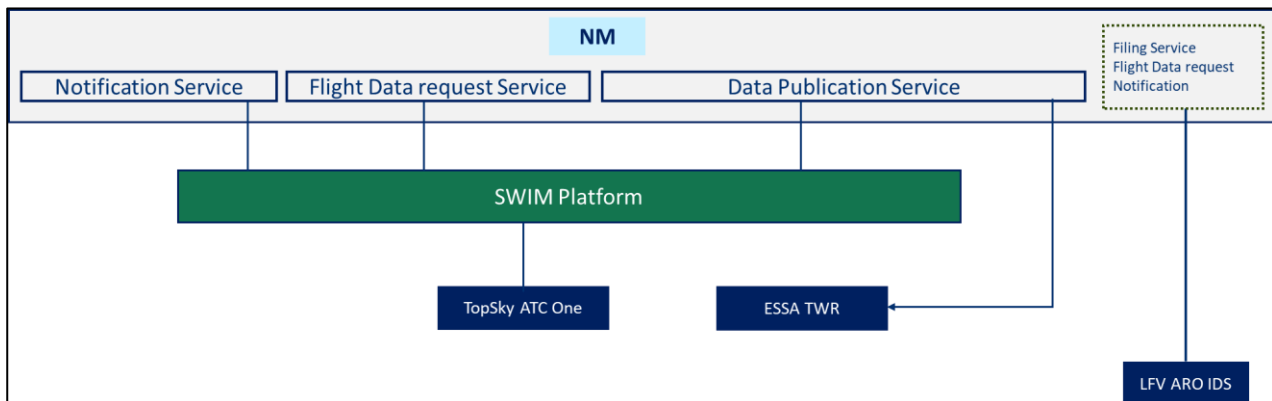
To consume the FF-ICE/R1 SWIM Services, LFV will utilise a central SWIM Platform, with the new TopSky ATC One system consuming and using the FF-ICE/R1 services via this platform.

LFV plans to utilise a central SWIM platform through which to consume FF-ICE/R1 services through. The new TopSky ATC One system will in turn be connected to the SWIM platform, rather than consuming eFPLs through a direct connection with NM.

Swedavia owns the TWR systems at Stockholm Arlanda Airport, meaning they are responsible for the upgrade of these systems in terms of FF-ICE/R1 implementation. These systems will consume the data publication service directly from NM, meaning that there is no dependency on LFV to enable the implementation of FF-ICE/R1 capabilities for the TWR systems.

FF-ICE/R1 selected architecture approach

In the case of Sweden, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Platform	?	?	31/12/2025	N/A
Malmo ACC/FDP	N/A	N/A	N/A	10/01/2029
Stockholm ACC/FDP	N/A	N/A	N/A	10/01/2029
ESSA/ TWR Systems (SWEDAVIA responsibility)	N/A	N/A	N/A	10/01/2029

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Platform	?	?	31/12/2025	N/A
Malmo ACC/FDP	N/A	N/A	N/A	10/01/2029
Stockholm ACC/FDP	N/A	N/A	N/A	10/01/2029

ESSA/ TWR Systems (SWEDAVIA responsibility)	N/A	N/A	N/A	10/01/2029
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Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Platform	?	?	31/12/2025	N/A
Malmo ACC/FDP	N/A	N/A	N/A	10/01/2029
Stockholm ACC/FDP	N/A	N/A	N/A	10/01/2029
ESSA/ TWR Systems (SWEDAVIA Responsibility)	N/A	N/A	N/A	10/01/2029

4.28. Switzerland FF-ICE Release 1 Implementation Roadmap

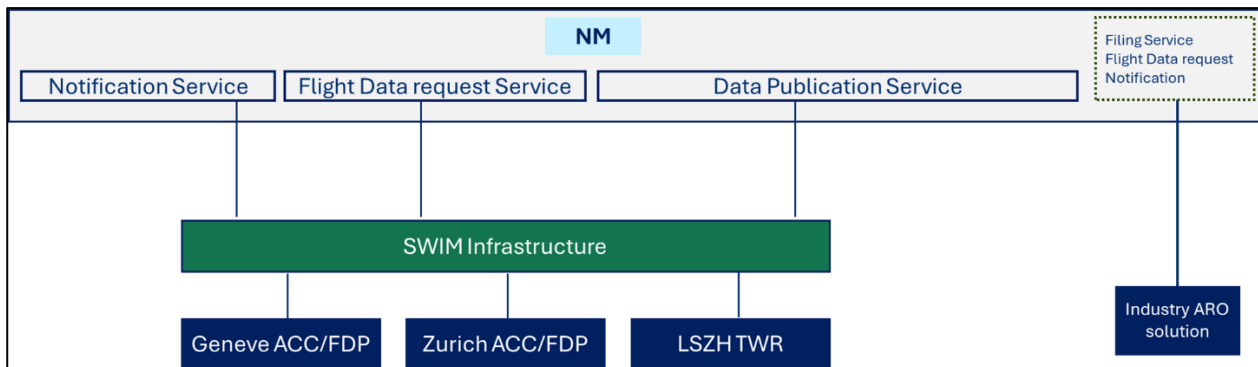
Introduction

Skyguide will implement a central SWIM infrastructure, which the FDPs of Geneva ACC and Zurich ACC will be connected to, and consuming/using the FF-ICE services. LSZH TWR will also be connected to this SWIM Infrastructure in the same manner.

Skyguide also anticipates using an industry ARO solution.

FF-ICE/R1 selected architecture approach

In the case of Switzerland, the approach is covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service.



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Infrastructure	2027	31/03/2029	30/06/2029	N/A
Zurich ACC/FDP	N/A	N/A	N/A	30/06/2030
Geneve ACC/FDP	N/A	N/A	N/A	30/06/2030
LSZH TWR	N/A	N/A	N/A	30/06/2030

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Infrastructure	2027	31/03/2029	30/06/2029	N/A
Zurich ACC/FDP	N/A	N/A	N/A	30/06/2030
Geneve ACC/FDP	N/A	N/A	N/A	30/06/2030
LSZH TWR	N/A	N/A	N/A	30/06/2030

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
SWIM Infrastructure	2027	31/03/2029	30/06/2029	N/A
Zurich ACC/FDP	N/A	N/A	N/A	30/06/2030
Geneve ACC/FDP	N/A	N/A	N/A	30/06/2030
LSZH TWR	N/A	N/A	N/A	30/06/2030

4.29. Norway FF-ICE Release 1 Implementation Roadmap

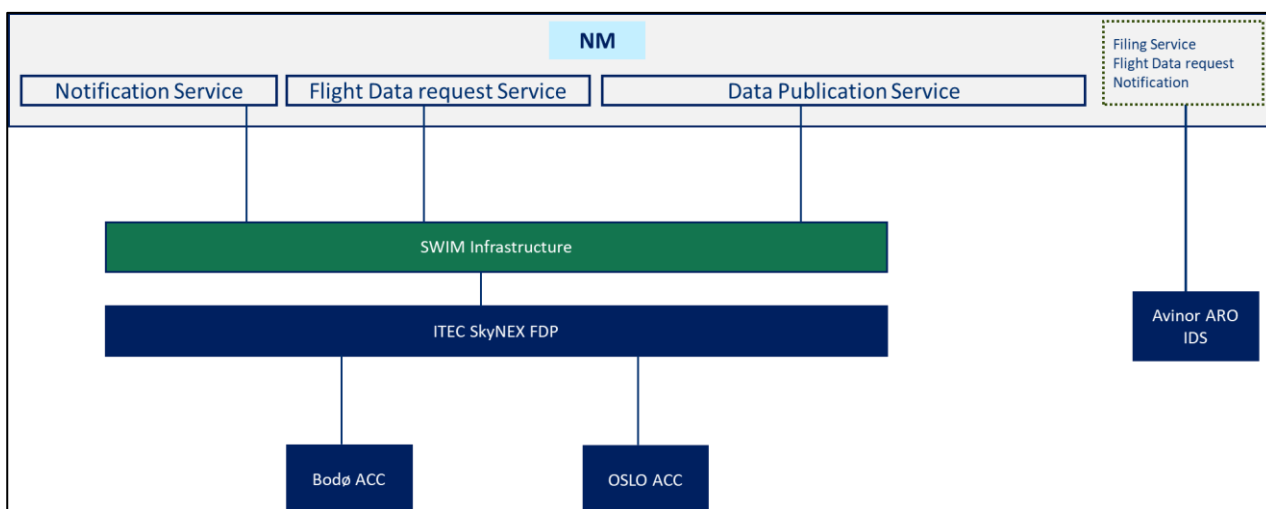
Introduction

Avinor intends to follow the products delivered in the iTEC alliance where the next generation is planned to support FIXM models and support FF-ICE release 1. Local implementation is planned currently for 2030 in Norway South (Oslo ATCC and Stavanger ATCC) and 2032 in Norway North (Bodø ATCC). An iTEC system will be implemented in both Norway South and Norway North. Testing of functionality is planned to be conducted in common for the iTEC alliance.

There is also a project (NetTSO) replacing the complete TWR ATM system in Gardermoen TWR, planned for 2027/2028. Implementation will be coordinated with iTEC implementation to reduce risk. NetTSO will be FF-ICE compatible.

The Norwegian AIS reporting office is common for all Norwegian airports and ANSP's. The current AFTN system is being replaced by "IDS AirNav" system from ENAV and development of FF-ICE functionality and implementation is expected in line with other stakeholders with the same system within the end of 2025.

FF-ICE/R1 selected architecture approach: In the case of Norway, the approach covering all FF-ICE services; Flight Data Request, Notification and Data Publication Service are illustrated below:



FF-ICE/R1 Service deployment overview

Flight Data Request Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bodo ACC/FDP	01/01/2030	01/06/2031	01/11/2031	30/06/2032
Oslo-Stavanger ACC/FDP	01/01/2028	01/06/2029	30/06/2030	30/06/2030
ENGM/TWR Systems	Not yet planned	Not yet planned	Not yet planned	Not yet planned

Notification Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bodo ACC/FDP	01/01/2030	01/06/2031	01/11/2031	30/06/2032
Oslo-Stavanger ACC/FDP	01/01/2028	01/06/2029	01/11/2029	30/06/2030

Data Publication Service

Location	Start of implementation and testing on NM pre-ops	Validation PreOps	DM1 Connectivity	DM2 Operational use
Bodo ACC/FDP	01/01/2030	01/06/2031	01/11/2031	30/06/2032
Oslo and Stavanger ACC/FDP	01/01/2028	01/06/2029	01/11/2029	30/06/2030

ENGM/TWR Systems	01/01/2028	01/06/2029	01/11/2029	30/06/2030
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5. List of acronyms

Acronym	Meaning
ACC	Area Control Center
ADEXP	ATS Data Exchange Presentation
AF	ATM Functionality
AIC	Aeronautical Information Circular
AIS	Aeronautical Information Servis
AIM	Aeronautical Information Management
AMS	Airport Movement System
ANSP	Air Navigation Service Provider
AN-CONF	Air Navigation Conference
API	Application Programming Interface
APP	Approach
ARO	ATS Reporting Office
ATS	Air Traffic Services
A-SMGCS	Advanced Surface Movement Guidance and Control System
ATC	Air Traffic Control
ATM	Air Traffic Management
AU	Airspace User
B-RNAV	Basic Air Navigation
B2B	Business-to-Business
B2C	Business-to-Consumer
CFSP	Computer Flight Planning Service Providers
CP1	Common Project One Reg. (EU) n. 2021/116
DLS	Data Link Services
DM	Deployment Milestone
DMAN	Departure Manager
eEAD	Enhanced European AIS Database Service
EASA	European Union Aviation Safety Agency
EATMN	European Air Traffic Management Network
EFS	Electronic Flight Strip System
eFPL	FF-ICE Flight Plan
EU	European Union
FAA	Federal Aviation Administration
FDP	Flight Data Processing
FIXM	Flight information exchange model
FF-ICE / R1	Flight and Flow Information for a Collaborative Environment Release 1
FPL	Flight Plan
FPM	Flight Progress Messages
FPFDE	Flight Plan and Flight Data Evolution
FPL2012	ICAO Flight Plan 2012 Format
GAT	General Air Traffic
GUFID	Global Unique Flight Identifier

IBG	Investors Buy-in Group
ICAO	International Civil Aviation Organisation
IER	Information Exchange Requirements
IFPS	Integrated initial Flight Plan processing System
IFR	Instrument Flight Rules
ITWP	Integrated Tower Working Position
KHZ	kilohertz
LSSIP	Local Single Sky ImPlementation
MUAC	Maastricht Upper Area Control
NDOP	Network Directors of Operation
NDTECH	Network Directors of Technology
NewPENS	New Pan European Network Service
NM	Network Manager
NM B2B	Network Manager Business-to-Business Web Services
NSA	National Supervisory Authority
OAT	Operational Air Traffic
OPS	Operations
R&D	Research and Development
RVSM	Reduced Vertical Separation Minima
SDM	SESAR Deployment Manager
SDP	SESAR Deployment Programme
SESAR	Single European Sky ATM Research
SID	Standard Instrument Departures
SWIM	System Wide Information Management
TBO	Trajectory-Based Operations
TCT	Traffic Complexity Tool
TWR	Tower
VFR	Visual Flight Rules

6. Referenced documents

- [1] FF-ICE/R1 Implementation Roadmap 2023, first edition
- [2] Commission Implementing Regulation (EU) 2021/116 (Common Project 1 / CP1)
- [3] SESAR Deployment Programme 2024
- [4] Information Exchange Requirements FF-ICE/R1 (IERs)
- [5] FF-ICE/R1 Use Cases document
- [6] Operational Deployment of NM B2B Web Services document