SESAR Deployment Programme 2022

Supporting Material 2023 to SDP Implementation

2022-122-SESAR Deployment Manager FPA
SGA MOVE/E3/SUB/2022-122/SI2.875834

Deliverable 2.3.1

11.07.2023

Authoring and approval – Control Page

Approved by	**Mariagrazia La Piscopia** Executive Director	**Date** 28/06/2023	**Signature** Signed
Reviewed by	**Erich Klock** Head of Strategy and Technical Execution	**Date** 27/06/2023	**Signature** Signed
Prepared by	**Cristian Pradera** ATM Modernisation Planning Coordinator	**Date** 20/06/2023	**Signature** Signed

Table of Contents

Introduction

This SDP Supporting Material complements the SESAR Deployment Programme 2022, as delivered by SDM in May 2022 and published in August 2022 by the European Commission.

It includes elements aiming at increasing the clarity of the SDP itself, as well as providing additional guidance for stakeholders required to invest in the CP1 implementation. For instance, it includes the recommended Deployment Approaches with selected priorities per ATM Functionalities (so called Short-Term Deployment Approach) and the main risks to be taken into account. It also contains the performance methodology applied by SDM to estimate the benefits delivered by the CP1 implementation. Besides, this introduction section addresses key ATM strategic topics like digitalisation, the EU Green Deal or the CNS infrastructure evolution, to which the SDP also contributes.

Finally, the document includes an update of the Standardisation and Regulation support to CP1 deployment, addressing the standards, specifications, Means of Compliance, etc. that are supporting the implementation of the SDP Families.

1. SDP 2022 further clarification

Introduction

The SESAR Deployment Programme 2022 has been developed in accordance with the CP1 Regulation to detail and drill down the system requirements foreseen and it can be updated only as a consequence of the CP1 regulation modification. Nevertheless, during consultation and interactions with stakeholders, some further clarifications appear necessary.

The objective of this chapter is to go through some requirements that may be subject to different interpretations or that need some further clarifications and provide the necessary support to the stakeholders in order to achieve a synchronised and seamless implementation.

1.1 AF1 - Extended Arrival Management and Integrated AMAN/DMAN in the High-Density Terminal Manoeuvring Areas

Family 1.1.1 Arrival Management extended to en-route airspace

The CP1 mandates a minimum range of 180NM, but a shorter range can be considered when recommended in SDP. SDP allows for consideration "when, due to the geographical location of the arrival airport, the extension of the AMAN does not provide additional performance benefits". In these cases, when the stakeholder has considered horizon range less than 180 NM from the mandated airport, they shall provide relevant evidence/report of justification of no additional performance benefits, for assessment and verification by the SDM.

Family 1.2.1 AMAN-DMAN Integration

The responsibility for deployment of DMs listed in SDP should be addressed by the stakeholders involved (ANSP and AO), providing AMAN, DMAN service and associated service requirements at the mandated airport. A discussion is required between the local ANSP, Airport Operators and Regulators, based on area of service provision, responsibilities must clearly be delineated. In particular there is a need to identify which local parameters should be used, e.g. when and which alerts are triggered, on which control positions, how they should be displayed and associated bilateral agreements (Letter Of Agreement –LOA–).

Regarding DM3 "Upgrade CWP to incorporate the information from integrated AMAN/DMAN", this deployment milestone can be considered as optional, depending on the local configuration of the AMAN/DMAN integration. This DM applies where there is an identified operational need to revise the presentation to the operational actors. In other cases set the milestone as N/A in monitoring and reporting and provide a comment explaining why the action is not applicable.

1.2 AF2 – Airport Integration and Throughput

Family 2.1.1 Departure Management Synchronised with Pre-Departure sequencing

Variable Taxi Times (VTTs) is an area that have been subject to different interpretations. The reasons for having the most predictable VTT is that this leads to the most predictable Take-Off Time (TOT) which helps with network capacity planning and reducing delays. The DPI & API Implementation Roadmap defines the acceptance criteria for DPI messages including TTOTs that are impacted by VTTs.

The roadmap references the A-CDM Manual 2017 which has this to say about VTTs in section 3.4 Variable Taxi Times: "In order to keep track of the traffic situation taxi time parameters can be adjusted in order to hold or release aircraft at/from the stand, with the purpose to regulate traffic based on actual events. Surveillance data from radar or routing information from Advanced SMGCS, clearance input from controllers, or manual controller correction of taxi time values are all means to modify the taxi time estimates into more realistic values".

Regarding the Advanced taxi time calculation, the methods previously detailed concern static data obtainable from look up tables. Available systems or tools (e.g., A-SMGCS) should be able to accurately and progressively predict the taxi time dynamically using more sophisticated data sources. Any ground movement surveillance equipment, taking into account the conditions or position of the aircraft, will be able to improve the prediction of EIBT and ETOT or TTOT.

More specifically, it must be considered that routing and planning are not needed to achieve VTTs. The difference between having routing and not having routing is that the initial estimate is potentially better. But once the aircraft is en-route to the holding point, and route clearances are put into the ECI (EFPS) system then the update based on live traffic derived from A-SMGCS method is the same, albeit the complete route to the holding point may not be known at that time. The estimate can still be updated though based on known data and this is better than a completely static table. This means that a look-up table that does not then take account of live apron and taxiway traffic will not give an accurate result.

Family 2.2.1 and 2.2.2 Initial and extended AOP (iAOP & E-AOP)

The SESAR Solution 21 and OFA 5.1.1 that were the first incarnation of this AOP topic and data sharing with the NM contained too many parameters to be practical. ACI Europe therefore lead the work to define the means of compliance to implement the iAOP. The document references all the NM implementation guides and roadmaps that support the data exchanges needed for Families 4.2.2 and 4.4.1. The compliance document is referenced in the Standard and Regulations section of this Supporting Material document. A similar document is being produced to provide guidance to the CP1 (IR2021/116) for the extended AOP and integration of the extended AOP with the network operations plan. This is targeted to be ready mid-2023.

Family 2.3.1 Airport Safety Nets

The area of interpretation is about the meaning of local variations in relation to safety nets. Quote from CP1 section 2.1.3 ATM sub-Functionality on airport safety nets:

"Any local limitations to the introduction of the airport safety support service must be indicated in the deployment programme. The RMCA function acts as a short-term alerting tool, whereas the CATC and CMAC act as predictive tools that aim at preventing situations where an RMCA alert may be triggered."

And from the system requirements in that section:

"Airport safety nets must integrate advanced surface movement guidance & control system ('A-SMGCS') surveillance data and air traffic controller clearances related to the manoeuvring area. Airport conformance monitoring must integrate A-SMGCS surveillance data and when available surface movement routing and air traffic controller routing clearances.

A-SMGCS must include a function to generate and distribute the appropriate alerts. Such alerts are meant to supplement, not replace, the existing RMCA."

The reference documents for compliance to safety nets are:

EUROCONTROL Specification for Advanced-Surface Movement Guidance and Control System (A-SMGCS) Services document reference EUROCONTROL SPEC 171 dated April 2020. For a better understanding and interpretation, Spec 171 uses the following language conventions:

Shall - indicates a requirement which is mandatory or necessary to provide conformity with this specification.

Should - indicates a requirement which is recommended.

May - indicates a requirement which is optional or permitted.

This document references the EUROCAE standard ED-87: EUROCAE Document ED-87E Minimum Aviation System Performance Standard (MASPS) for Advanced Surface Movement Guidance and Control Systems (A-SMGCS) dated April 2022.

The specification (EUROCONTROL SPEC 171) identifies the types of alerts and safety support services in section 3.3 Airport Support Services as:

"The Airport Safety Support Service is designed on the basis of one or more of the following three functions. These functions may be partially introduced depending on local requirements e.g. not all CATC or CMAC alerts may be suitable depending on the aerodrome layout:

Runway Monitoring and Conflict Alerting (RMCA)

Conflicting ATC Clearances (CATC)

Conformance Monitoring Alerts for Controllers (CMAC)."

Section 6 A-SMGCS requirements states in the opening paragraph that:

"Whichever of the services and associated requirements are selected for implementation, discussion is required between the local ANSP, airport operators and regulators. In particular there is a need to identify which local parameters should be used, e.g. when and which alerts are triggered, on which control positions and how they should be displayed."

Section 6.3 Airport Safety Support Services lists the following mandatory services as mandatory by use of the word "shall":

"A-SMGCS-[SAFE]-[010] The Airport Safety Support Service shall be designed on the basis of one or more of the following functions RMCA, CATC and CMAC."

Since it is stated that not all CATC and CMAC alerts may be suitable as noted above, only RMCA has no caveats attached to it. Combined with the language of CP1 of must in relation to RMCA alerts as noted above, RMCA is mandatory with no exceptions. As a footnote, RMCA does not rely on routing and planning functions.

CATC and CMAC must also be implemented, and any local variations must be agreed between the local ANSP, airport operators and local regulators.

1.3 AF3 – Flexible ASM and Free Route Airspace

Family 3.1.1 ASM and A-FUA

The displaying of reserved areas on ATCOs CWPs by manual trigger has been accepted as possible option both in case of DM1a *Deploy automated ASM support systems (LARA or equivalent)* and DM1b *Adopt the NM system (CIAM) for ASM capabilities*.

DM8 should be read as follows:

If ASM data are provided through NM system capabilities (DM1b) or the ASM system is still not connected with the ATC system via SWIM (5.3.1 ARES DM1), ATC systems could be manually triggered to display the airspace status on CWP.

Family 3.1.2 Management of Predefined Airspace Configurations

A new option has been foreseen in the SDP (DM2b Use NM systems and application), to support those stakeholders able to share the relevant data, even if using two or more different systems.

Both for Family 3.1.1 and Family 3.1.2, system interoperability and data exchange shall be targeted at compliance with the requirements set out in AF5.

1.4 AF4 – Network Collaborative Management

This section aims at clarifying the AOP/NOP data exchanges and referencing all NM implementation guidelines and roadmaps that support the data exchanges needed for Families 4.2.2 and 4.4.1. The details to all the documents referred can be found in Chapter 4.4.

Family 4.2.1 Interactive Rolling NOP

The DM3 for ANSP refer to reception and handling the Target Time from the slot allocation and revision messages. The DM3 for ANSP refers to reception and handling the Target Time from the slot allocation and revision messages. Any "TTO" field if present in the SAM/SRM therefore currently contains this data element to indicate that the corresponding CTOT is always adjusted to respect the most penalizing regulation contained in the TTO.

Receiving the target time from SAM/SRM and handle it in the systems is the basis for any procedures or processes related to airborne target time adherence in the future.

Family 4.2.2 Initial AOP/NOP Information Sharing

The suggested sequence to look at the supporting documents is to start with the "Guidance on Compliance" document, giving a summary on the requirements in the CP1 related to iAOP and AOP-NOP. Details on the data elements to be exchanged should be taken from the iAOP-NOP implementation guide, which is a document that was produced by ACI Europe together with EUROCONTROL where the data elements were agreed. Apart from the data elements it also comprises a summary of the steps to be taken to establish the iAOP-NOP connection that should be taken into consideration during the project planning. The technical details for the data exchange and guidelines are then to be taken from the referenced EUROCONTROL documents therein (e.g. DPI Implementation Guide, API Implementation Guide).

Family 4.4.1 AOP/NOP Integration

For Family 4.4.1 - AOP-NOP Integration there will be documents available (along 2023, see section 4.4) to provide guidance to the CP1 (IR2021/116) for the extended AOP and integration of the extended AOP with the network operations plan, and the implementation guide in similar fashion as to Family 4.2.2 Initial AOP/NOP Information Sharing. Please note that stakeholders targeting Extended AOP implementation should also refer to the documents on iAOP and iAOP-NOP to obtain a complete picture (please also refer to AF2 documentation on these Families).

1.5 AF5 – SWIM

The following section provides AF5 clarifications that complement the SDP. For a complete implementation reference it has to be considered both the content of this document together with the SDP.

The requirements in this section are either mandatory (shall), recommended (should) or optional (may).

All SWIM Services

CP1 applies in all EU Member States, plus Norway and Switzerland. EU law does not apply for UK after Brexit. The arrangements UK has with NM are not part of CP1. Therefore, CP1 does not apply to flights in UK.

EU law does not apply to OAT operations according to Article 1 (2) of 549/2004, which states: "This Regulation and the measures referred to in Article 3 do not cover military operations and training". However, CP1 is applicable to military when flying GAT operations. According to CP1, FF-ICE flight plans are to be filed and shared via SWIM services. Furthermore, CP1 states: "In deploying the SWIM Functionality, Member States must ensure that civil or military cooperation is run to the extent required by point 3.2 of Annex VIII to Regulation (EU) 2018/1139", which states that: "The EATMN, its systems and their constituents shall support the progressive implementation of civil/military coordination, to the extent necessary for effective airspace and air traffic flow management, and the safe and efficient use of airspace by all users, through the application of the concept of the flexible use of airspace."

To achieve the above objectives, the EATMN, its systems and their constituents shall support the timely sharing of correct and consistent information covering all phases of flight, between civil and military parties, without prejudice to security or defense policy interests, including requirements on confidentiality.

Family 5.3.1 DIGITAL NOTAM Service

Service Provision (clarification on who needs to provide the service):

The service shall be provided by all AISPs in CP1 mandated states.

Information and Functional Scope of the service (clarification for the service provider on the different functionalities or information that needs to be provided by the service):

The service shall enable the exchange of Digital NOTAM information in support of graphical Pre-flight Information Bulletins (ePIB) for the CP1 mandated airports under the responsibility of the AISP. AISPs with no CP1 mandated airport are still recommended to implement this information exchange for aerodromes under the responsibility of the AISP that serve scheduled international commercial air transport operation. This exchange contributes to improving the situational awareness at the applicable airport bringing benefits to flight crews, FOC/WOC, ARO, airport's self- briefing rooms, air traffic and ground controllers.

The service shall enable the exchange of Digital NOTAM information in support of take-off and landing performance calculations for all aerodromes serving scheduled international commercial air transport operation. All AISPs are mandated to implement this information exchange for all airports within their area of responsibility that are used for international IFR operations. This contributes to the completeness and usability of the aeronautical information updates that might have an impact on take-off and landing performance calculations.

The service shall enable the exchange of Digital NOTAM information in support of situational awareness on runway contamination with water/snow/ice for all aerodromes serving scheduled international commercial air transport operation. All AISPs are mandated to implement this information exchange for CP1 mandated airports or at least the airports used for international IFR operations within their responsibility. This contributes to situational awareness providing contamination status of the airport surfaces and the runway condition allowing seamless integration in the airline operational centre systems.

The service shall enable the exchange of Digital NOTAM information in support of situational awareness of airspace status for VFR users. All AISPs are mandated to implement this information exchange. This contributes to reduce the risk of airspace infringements that occur due to the difficulties experienced by

airspace VFR users when dealing with large numbers of airspace activations/reservations, in particular at low altitudes. This allows seamless integration in the commercial products/devices used by the GA, VFR, UAS community.

Technical Capability (clarification for the service provider on the technical capabilities to be implemented by the service):

The service shall use AIXM 5.1.1 and the event extension to exchange aeronautical information.

Reference Specification (clarification for the service provider on the specifications that service needs to conform to):

The service shall be implemented as specified in the European SWIM Registry based on EUROCONTROL Digital NOTAM Subscription and Request service definition elaborated by the A3SG (once available).

The service shall be implemented in alignment with EUROCONTROL Digital NOTAM Specification for the encoding of NOTAM information in AIXM.

Family 5.3.1 Aeronautical Information Features Service

Service Provision (clarification on who needs to provide the service):

The service shall be provided by all AISPs in CP1 mandated states.

Information and Functional Scope of the service (clarification for the service provider on the different functionalities or information that needs to be provided by the service):

The service shall provide all the information elements related to AIP data for the geographic scope that corresponds to the area of responsibility of the AISP (service provider). The concrete list of required information elements is part of the service definition.

The service shall provide all the information elements related to obstacle data for the geographic scope that corresponds to the area of responsibility of the AISP (service provider). The concrete list of required information elements is part of the service definition.

The service shall provide all the information elements related to aerodrome mapping data for the geographic scope that corresponds to the area of responsibility of the AISP (service provider), for CP1 mandated airports. (i.e. an AISP with no CP1 mandated airport is not required to provide the aerodrome mapping data as part of the AIFS service implementation). The concrete list of required information elements is part of the service definition.

The service may provide information elements related to Instrument flight procedure data for the geographic scope that corresponds to the area of responsibility of the AISP (service provider). This is not part of the mandated implementation.

Technical Capability (clarification for the service provider on the technical capabilities to be implemented by the service):

The service shall use AIXM 5.1.1 and the necessary extensions (e.g. ADR) to exchange aeronautical information.

The service shall enable the retrieval of information using filtering by feature type, feature name, spatial, temporal and logical operators.

Reference Specification (clarification for the service provider on the specifications that service needs to conform to):

The service shall be implemented as specified in the European SWIM Registry based on EUROCONTROL Aeronautical Information Request Service definition elaborated by the A3SG.

Family 5.3.1 Aerodrome Mapping Service

Service Provision (clarification on who needs to provide the service):

The service shall be provided by all AISPs that are responsible for the publication of aerodrome mapping information for a CP1 mandated airport.

Information and Functional Scope of the service (clarification for the service provider on the different functionalities or information that needs to be provided by the service):

The service shall allow the retrieval of aerodrome maps, including all features related to aerodrome mapping data that can be geospatially integrated in a map. This service is an enabler for applications that overlay actual/real-time information about closure of runway, taxiway, work in progress on aerodrome movement area, temporary erected obstacles.

The service shall provide information for the CP1 mandated airports under the responsibility of the service provider.

Technical Capability (clarification for the service provider on the technical capabilities to be implemented by the service):

The service shall allow the retrieval of maps including GIS layers based on geospatial and temporal filters.

The service shall be implemented as specified in the European SWIM Registry based on EUROCONTROL Aeronautical Aerodrome Map Request Service definition elaborated by the A3SG.

Service Consumption (clarification on who needs to consume the service):

AOs should consume information from Aerodrome Mapping services.

Family 5.4.1 Meteorological information Exchange

Volcanic Ash Service:

ICAO AMD81 introduces a concept for new quantitative volcanic ash information, which will replace the currently used European volcanic ash concentration charts. The two designated Volcanic Ash Advisory Centers in Europe (Toulouse and London) will provide quantitative volcanic ash information (when required) as a SWIM service in compliance with CP1, by end of 2024. It is expected that all users of aeronautical volcanic ash information will be capable of accessing, consuming and demonstrating operation use of these new SWIM services in order to confirm compliance with this CP1 requirement.

Aerodrome MET Service:

NM is not listed as a required consumer of these types of aerodrome SWIM services, since routine airport weather is not of primary concern to their operations – only when there are significant disruptive weather conditions at multiple congested airports simultaneously, there will be consequential impacts on NM operations and network stability. Therefore, NM's primary concern regarding weather at aerodromes is specific to these types of co-dependant weather events, which are expected to be included in the AF5.4 SWIM MET service dedicated to NM operations.

The MET3SG group which brings together AF5.4 stakeholders from the communities of MET producers and users, is currently developing guidance and examples of the types of MET SWIM Services which could be considered under this CP1 Family in order, for both service provider and consumer, to comply with the regulation.

En-route and Approach MET Service:

As with the Aerodrome MET Services, NM is not listed as a required consumer of en-route SWIM Services, since there is a specific and dedicated Network Meteorological Information Service tailored for their bespoke requirements. In reality, the same MET information (such as that from WAFC, turbulence, icing convection etc) will be provided under the services for both "en-route and approach" and "Network Manager", but the latter will also include additional information specific to NM operations, including significant weather at

some aerodromes, and assessments of risk of network disruption i.e. from widespread large-scale summer convection.

Family 5.6.1 Extended AMAN Service

Scope clarifications

In principle, Family 5.6.1 inherits the scope from Family 1.1.1 which implementation deadline occurs end of 2024.

By end of 2025, all 18+2 CP1 AF1 airports shall publish their Extended AMAN service in the SWIM service registry.

By end of 2025, all ACC units with en-route responsibility which have previously been adjudicated as applicable in AF1, shall consume and use the respective Extended AMAN services.

ACC units with en-route responsibility and previously adjudicated as Not Applicable in AF1, should review the evolving flow and traffic streams relationships and the effective horizon as implemented by the mandated airport, which may be more than the required minimum 180 NM. If the operating environment has changed in a significant way, the decision to shorten the AMAN distance should be reconsidered.

ACC units not responsible for en-route airspace but otherwise concerned with the operation of a mandated AMAN horizon, are recommended to also consume the SWIM service and to effect such adaptations in their systems as required to make efficient use of the service. This concerns primarily the ATS units handling in-horizon airports.

Additional information sharing system support may be needed for cases of overlapping horizons or AMAN serving multiple airports, both of which are found in the scope of this ATM Functionality.

The Monitoring View 2023 will provide a detailed listing of all impacted ACCs per CP1 AMAN horizon. ACC units with en-route responsibility should report on the implementation status for all the AMAN airports in whose horizon they reside, and additionally, inform on any additional system support implemented or required, for instance for the reconciliation of overlapping horizons.

Family 5.6.1 FF-ICE Service

SDM, together with NM, has launched an initiative to develop a European detailed implementation roadmap from all stakeholders concerning the implementation of FF-ICE/R1 services and to support the actual implementation. An agreed high level plan is expected fall 2023 with a detailed plan ready spring 2024.

AISP's providing ARO services are mandated to update their Flight Plan filing services in order to support filing eFPL's. This service must be available December 31st the latest for AU's to start filing eFPLs.

Mandated AUs clarifications

All AUs operating in the EATMN Airspace are mandated by the CP1 regulation to fulfil the obligations explained in the regulation and SESAR Deployment Programme and file eFPL at the latest 31 December 2025.

Usage of the enriched FF-ICE FPL (eFPL) Data on ground.

ANSPs must upgrade their ground systems to process and receive the eFPL, but also to make operational use of it. The ultimate goal of the CP1 FF-ICE R1 implementation is to upgrade the FDPs ensuring that all the benefits will be achieved. SDM and NM have put forward an initiative with all stakeholders involved to elaborate a realistic implementation plan to achieve this goal. ANSPs shall use the new enriched FF-ICE FPL information which includes GUFI, Specific aircraft performance data (such as performance profile and speed schedule), structured route trajectory description, and MET data used for creation of the 4D trajectory.

1.6 AF6 – Initial Trajectory Information Sharing

AF6 is subject to the Industrialisation Target Date. To assess the readiness for deployment and availability of all the standardisation material required, EASA has set up the CP1 Industrialisation Forum, to which SDM is participating.

It is expected that by the end of the year or by early 2024, EC will decide, based on the recommendation made by EASA, whether the Industrialisation Target Date is passed and therefore whether AF6 remains in the CP1 Regulation or it is withdrawn.

SDM, together with S3JU, NM and EUROCAE, is contributing actively to the CP1 Industrialisation Forum to successfully pass the Industrialisation Target Date. The SDP recommends the implementation of the ADS-C Common Service, a SESAR Solution that would meet the requirements set in the CP1 Regulation for Data-Link and ATS Services providers regarding AF6.1.1 and AF6.1.3. However, it has to be noted that this solution is not mandated by the CP1 Regulation. SDM, together with EUROCONTROL/NM is co-leading a workstream under the Operational Excellence Programme with the support of multiple stakeholders to draft the technical specifications that will support the implementation of the ADS-C Common Service.

These technical specifications will be published by EUROCONTROL after a public consultation during the second half of 2023. One of them addresses the technical requirements to establish the ADS-C Common Service, whilst the second one addresses the technical requirements to distribute the EPP data on the ground via SWIM Yellow Profile.

Besides the technical specifications, it is also planned to publish Guidance Material by end of 2023 to support the stakeholders when deploying AF6 and making operational use of EPP.

All this material is based on the ADS-C CONOPS "ATS B2 early deployment in the systems", which is available at the following EUROCONTROL link CONOPS.

A brief overview of the CONOPS is reflected here[1]:

The Logon Service and an ADS-C Common Service (ACS) are functionally separated to clarify information flows. In practice, these can be merged meaning that the ADS-C common service would include the necessary logon functionalities acting as CM-server.

The Logon Service implements DLIC datalink messages (CM-logon, CM-contact and CM-forward) acting as a CM-server as specified in ICAO Doc 9880 and EUROCAE/RTCA ATS B2 standards. Primarily, it stores and shares logon information with the ACS (to establish ADS-C contracts) and ANSPs (establishing CPDLC connections).

The ADS-C Common Service manages the ADS-C contracts with aircraft and provides a SWIM service interface so that remote ADS-C users can receive ADS-C/EPP data over ground infrastructure. The use of external flight status and positional data provided by NM will improve the management of contracts as currently demonstrated by SESAR PJ38.

[1] The following text has been extracted from the "ATS B2 early deployment in the systems" CONOPS

2. Short-Term Deployment Approach 2023

Introduction

The SESAR Deployment Programme illustrates the Deployment Approach to be followed in the deployment of each ATM Functionality included in the scope of the Common Project 1. The Deployment Approach for each AF (and Sub-AF) represents the possible sequencing of the deployment activities (e.g., of specific Families) associated to an ATM Functionality and it corresponds to the preferred approach to be followed by operational stakeholders impacted by the CP1 Regulation, and therefore requested to invest in the implementation of new technologies and/or operational improvements.

By construction, the SDP Families and the recommended Deployment Approaches per ATM Functionalities are stable in time and could only be changed at the occasion of an evolution of the Common Project regulations or after the Industrialisation Target Date set in AF6 is passed. Given the need to adjust and better steer the overall deployment activities in Europe, the Short-Term Deployment Approach is an evolving and periodically updated guidance material to operational stakeholders, best placed to identify the short-term elements to be addressed in order to achieve the overall AFs deployment in accordance with the deadline set by the CP1 Regulation.

In this perspective, the intention is to integrate the stable Deployment Approach by proposing the required Short-Term Implementation Needs that should be addressed by operational stakeholders. These Short-Term Implementation Needs could also serve as the basis to identify priorities for financial incentives in support to Common Projects' deployment and ATM modernisation in general.

These short-term elements, identified through the SDP Families, may evolve, as the overall CP1 implementation progresses. This is therefore a living document whose aim is to reflect only the short-term needs.

The Short-Term Deployment Approach is supported by three fundamental pillars: technical considerations, status of implementation in Europe, and performance aspects. The combination of these three key pillars – which are detailed hereafter – will support the identification of the Short-Term Deployment Approach and will allow SDM to focus its efforts on monitoring and supporting the implementation of the identified Families by the required operational stakeholders.

Technical considerations

The technical aspects rely on the need to deploy a given Family to successfully achieve the overall AF or Sub-AF from a technology perspective (systems and procedures). This implicitly means that the Families identified in the Short-Term Deployment Approach are paramount to continue and progress with the deployment of the Functionality. In some cases, it also happens that the Families within an AF are directly linked with Families belonging to a different AF (this is the case of AF5). In these cases, it is key to provide a transversal view by highlighting the internal dependencies.

Status of implementation in Europe

The status of CP1 implementation, based on the SDP Monitoring View, gives the actual picture of the current deployment of a given Family in the requested locations, vis-à-vis the geographical scope where the CP1 mandates the deployment of each ATM Functionality. As the SESAR Deployment Programme serves as a tool to achieve the successful and timely deployment of all sub-ATM Functionalities, there is a need to identify where there are still gaps in terms of implementation initiatives to be undertaken, and to monitor how the deployment is progressing across Europe.

Depending on the implementation gaps identified within the SDP Monitoring View, it will be therefore paramount to push for timely deployment by focusing stakeholders' effort and resources. The Families thus identified following these criteria will be part of the Short-Term Deployment Approach.

It is important to note that being part of the Short-Term Deployment Approach does not necessarily imply that a Family is the most important within a specific Sub-AF, either from a performance or technical

perspective. This simply means that the Family is only considered important for short-term deployment if there are delays or a lack of implementation across Europe.

For example, a Family can be currently part of the Short-Term Deployment Approach due to the lack of on-going implementation projects, but it could be removed from the Short-Term Deployment Approach in the next update, should the implementation progress (i.e., implementation projects are in the pipeline). This could also be extended to the inclusion of another Family in the Short-Term Deployment Approach in the future, as a continuation of the implementation of the Sub-AF. There could also be the case that a Family requires an immediate focus due to the proximity of the deadline set in the CP1 Regulation and an overall lack of global European implementation.

Performance aspects

Finally, the performance aspects must be taken into account in order to secure the positive CBA of the CP1, and the timely realisation of these benefits. Those Families that are mostly contributing to performance improvements, to digitalisation and to the objectives of the European Green Deal require special attention and focus, both from the deployment and monitoring perspective. Therefore, the Short-Term Deployment Approach will be complemented with a description of the performance contribution from each Family, and when possible, these benefits will be monetised extrapolating them until 2030.

It has to be noted that the monetisation of benefits, and the estimation of fuel, CO_2 and delay savings are based on the existing Implementation Projects under SDM direct coordination (i.e., real data) but also on an extrapolation of other projects and initiatives still to be implemented to achieve the full deployment of each Family.

How to interpret the Short-Term Deployment Approach diagrams

The Deployment Approach diagrams are represented following a GANTT-like orientation, using nodes and arrows to represent the milestones and activities. The aim of the Deployment Approach diagrams is both to show the dependencies between different Families and to illustrate their sequencing in time. This would help SDM not only to coordinate CP1 deployment activities and monitor its progress, but also to identify potential risks when the implementation is not progressing at the right pace, allowing *ad hoc* support from SDM to the relevant operational stakeholders.

Deployment Approach diagrams: Families and sub-AFs

Each Family is represented by an arrow, connecting different bubbles or nodes: these represent the intermediate steps of the Deployment Approach, meaning that a given Family or sub-ATM Functionality has been fully implemented and put into operations.

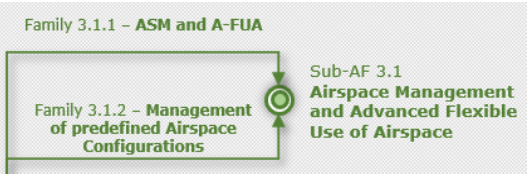


Figure 1. Example of the sequencing

The Families have been represented taking into consideration their dependencies, meaning that some of the Families can be implemented in parallel, whilst others need to be implemented in sequence. Each Family (arrow) starts from a bubble or node and ends in another node.

In the first example (Figure 1) it has been represented that Family 3.1.1 and 3.1.2 are contributing to the deployment of Sub-AF 3.1 – Airspace Management and Advanced Flexible Use of Airspace. At the same time, the chart depicts how Family 3.1.1 and 3.1.2 can be implemented in parallel.

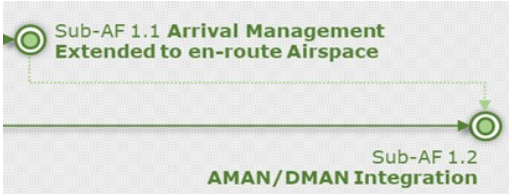


Figure 2. Example of interdependencies between sub-ATM Functionalities

To properly represent the sequencing and interdependencies of Families and sub-AFs, dotted lines have been added when a specific Family or a sub-ATM Functionality works as a predecessor or contributes to the full implementation of another sub-AF. The second example (Figure 2) explains how the full implementation of sub-AF 1.1 (AMAN upgrade to included Extended Horizon function) is significantly contributing to the subsequent implementation of sub-AF 1.2 (AMAN/DMAN integration).

Finally, the Families whose deployment is deemed more urgent and thus should be considered as priorities for the short-term are highlighted in the graph with a star.

To give a complete overview, charts showing the current status of implementation of the prioritised families have been included. For more details regarding those charts, please refer to the SDP Monitoring View 2021.

2.1 AF1 - Extended Arrival Management and Integrated AMAN/DMAN in the High-Density Terminal Manoeuvring Areas

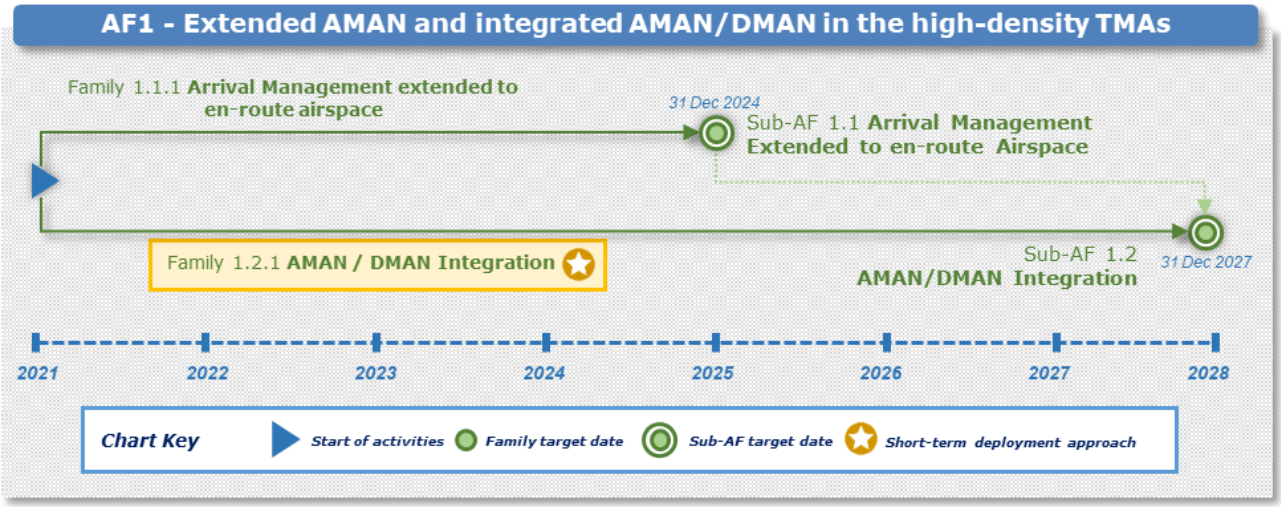


Figure 3. AF1 Short Term Deployment Approach

Introduction

In order to timely implement AF1, operational stakeholder need to deploy in parallel two sub-AFs and Families: Family 1.1.1 Arrival Management Extended to en-route Airspace and Family 1.2.1 AMAN/DMAN Integration, that carries the same pre-requisite technology (AMAN).

Rationale

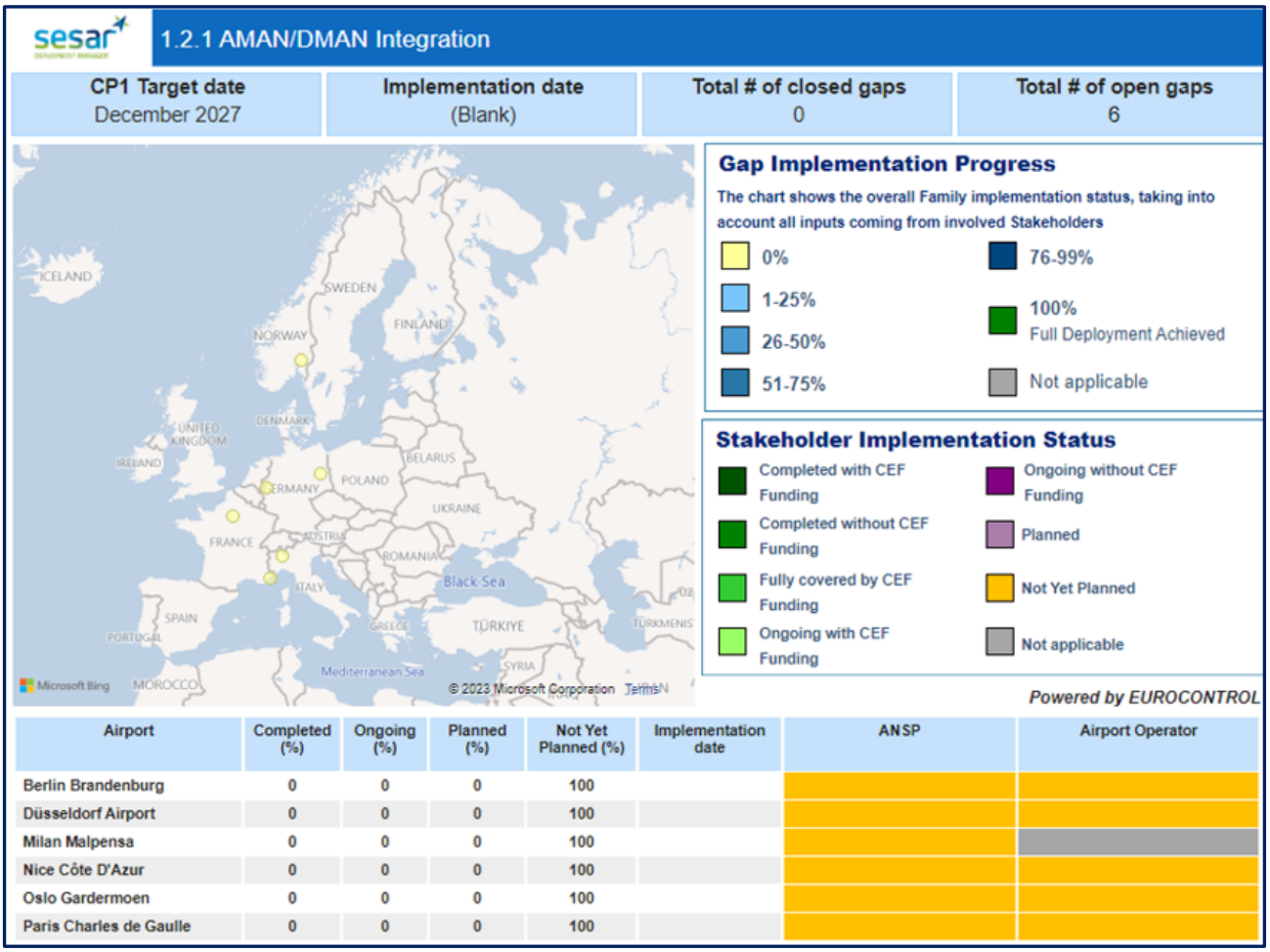
Family 1.2.1 AMAN/DMAN Integration must be ready by 31 December 2027, by the end of 2023 there will be 4 years left to complete the implementation at listed Airports. Considering the typical time of implementation projects (4 to 5 years) and that implementation projects have not formally being planned or initiated, it is suggested to focus the short-term deployment efforts on planning implementation projects for proper and timely implementation of Family 1.2.1.

The AMAN/DMAN integration applies to 5 airports in the CP1[2], which have single runway or dependent runways which may operate in mixed-mode or have departure runway linked with dependency to an arrival runway. Those airports are Berlin Brandenburg Airport, Düsseldorf International, Milan-Malpensa, Nice Côte d'Azur and Paris-CDG. The listed airports have overlapping extended horizon with each other, hence for homogeneous closing of Family AF-1 implementation, it is desirable to envisage more multistakeholder implementation project with as many airports and ANSPs involved as possible. This will ensure efficiency and cross-facilitation among the participants to the implementation projects with the objective to achieve a timely and coordinated implementation of the Family.

Deployment approach and synchronisation

The implementation project should address the Deployment Milestones described in the SESAR Deployment Programme 2022. Family 1.2.1, especially DM1 both ANSPs and AOs to ensure the coupling of the AMAN and DMAN systems, indicating properly which DMs are being covered by which stakeholders by linking specific tasks/activities to the corresponding DMs.

[2] On top of Berlin, Dusseldorf, Milan, Nice and Paris CDG, Oslo Gardermoen agreed to implement AMAN/DMAN integration according to "DECISION OF THE EEA JOINT COMMITTEE No 222/2022 (8 July 2022)". This is the reason why SDM is also monitoring its implementation (see figure 4).



Airport	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	ANSP	Airport Operator
Berlin Brandenburg	0	0	0	100			
Düsseldorf Airport	0	0	0	100			
Milan Malpensa	0	0	0	100			
Nice Côte D'Azur	0	0	0	100			
Oslo Gardermoen	0	0	0	100			
Paris Charles de Gaulle	0	0	0	100			

Figure 4. Current status of implementation of Family 1.2.1

If there are ongoing implementation projects addressing some of the pre-requisites (i.e., AMAN or DMAN), these should be highlighted and those links or interdependencies should be described in the implementation projects.

To successfully deploy AF-1 Family 1.2.1, stakeholders should consider below interdependencies:

- The AF 2 - Family 2.1.1: Departure management, Synchronised with Pre-departure sequencing, to be considered as these are interdependent with AF-1 Families. Efforts be made to ensure that it is duly considered during the development of the implementation projects, and that proper coordination is taking place with the counterpart implementing those Families.
- The AF 4 - Family 4.2.1: there are interdependencies with Collaborative-NOP to coordinate reconciled target times for improved ATFCM and stabilised arrival/runway sequence policy. Make sure that it is duly considered during the development of the implementation projects, and that proper coordination is taking place with the counterpart implementing those Families.
- The AF5 - Family 5.4.1 Implement Meteorological Information exchange and Family 5.6.1 Flight Information Exchanges are to be considered as interdependent with AF1 Families. To ensure interoperability of data exchanges concerning AMAN/DMAN integration, whereas Extended AMAN shall be implemented as a SWIM service.

Deployment of targeted system and procedural changes shall be synchronised with all affected ATS Units (ANSPs). Coordination, led by the ANSPs, needs to take place with impacted airports (Airport Operators), Airspace users (Airlines) and Air Traffic Flow Management Unit (ATFMU). AMAN/DMAN integration, in particular, requires synchronisation of investments among all affected ANSPs (ATS Units) and impacted Airport Operators in order to ensure optimised runway-use policy and ensure achieving all the associated

performance objectives/benefits listed in the section below. Synchronisation is also needed for enhanced tactical runway scheduling by ensuring improved predictability and stability of arrival sequence managing arrival fix metering time, target time of arrival as well as of linked departure sequence managing off-blocks times, start-up approval time and departure time (target take-off time).

Performance benefits

Integrated Arrival and Departure management aims at increasing airport and TMA throughput, resilience, and predictability by improved co-ordination between en-route/approach, local ATC and airports. Integration of runway sequence policy, respecting AMAN and DMAN constraints, allows for optimum utilisation of runway capacity with positive benefits of enhanced safety (reduced congestion and complexity in airport and in TMA), enhanced flight efficiency enabling reduction in fuel consumption and CO2 as well as noise emissions.

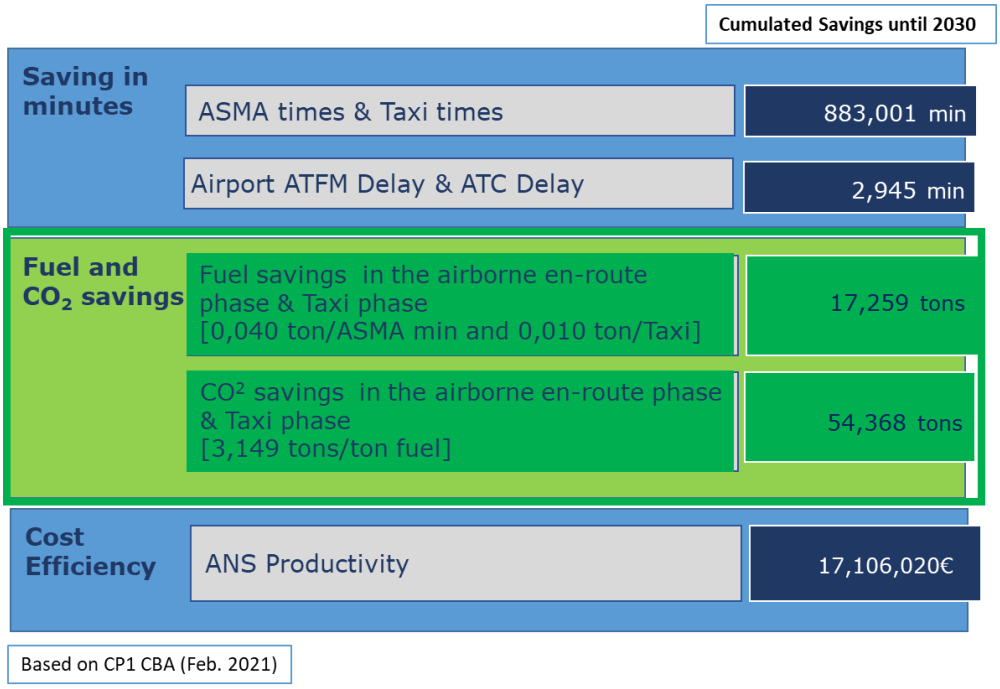
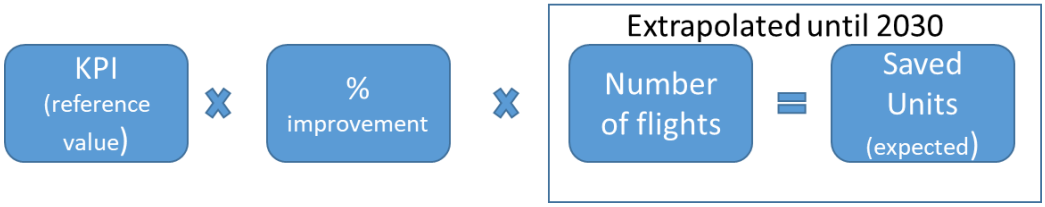


Figure 5. Benefit expected for Family 1.2.1

Methodology of performance calculation for AF1



The workflow above shows the calculation of savings for each KPI. The reference value for each KPI is stemming from PRU dashboards[3], where they are published on a monthly and yearly basis.

SDM estimates the impact after implementation of the respective ATM Family by multiplying the KPI reference value with the percentage of improvement, then with the related number of movements. The result are the expected saved units, cumulated until 2030.

[3] https://ansperformance.eu/

2.2 AF2 – Airport Integration and Throughput

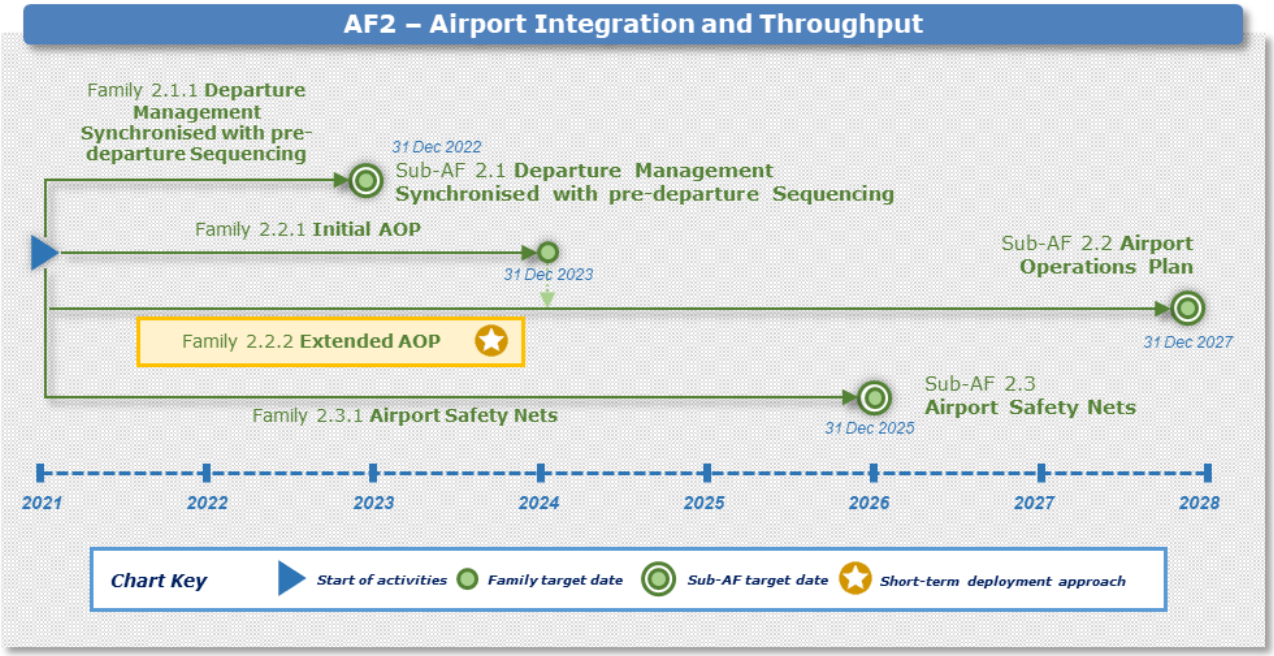


Figure 6. AF2 Short Term Deployment Approach

Introduction

AF2 is divided into four Families: 2.1.1 Departure Management Synchronised with Pre-departure sequencing, 2.2.1 Initial Airport Operations Plan, 2.2.2 Extended Airport Operations Plan and 2.3.1 Airport Safety Nets.

Rationale

The Short-Term Deployment Approach for AF2 focus on the Family 2.2.2 Extended Airport Operations Plan with a target date of 31/12/2027.

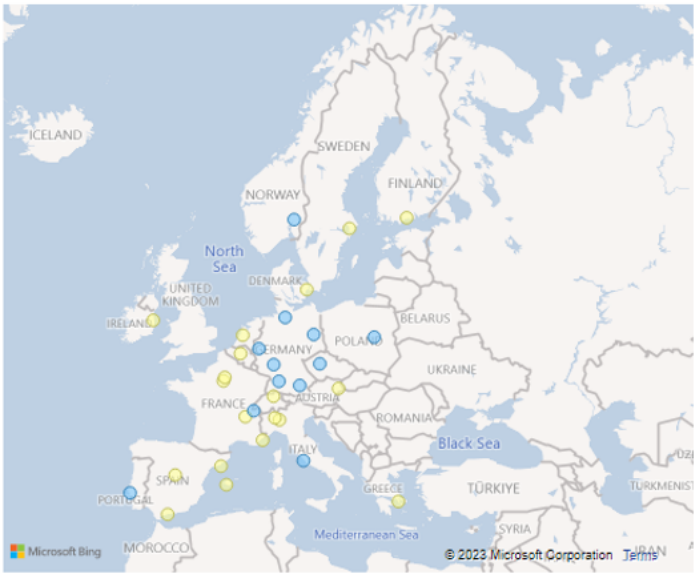
The rationale being that implementation of Families 2.1.1 DMAN synchronised with pre-departure sequencing, 2.2.1 Initial AOP and 2.3.1 Airport Safety Nets is already in place or in the pipeline for most airports and ANSPs. Completion date according to the regulation varies from 2022 to 2025 which in this respect can be considered a short timeframe. Progress is well underway as can be noted in the monitoring process carried out by SDM (see Monitoring View 2022).

Furthermore, focusing on Family 2.2.2 will ensure all gaps under Family 2.2.1 and 2.2.2 to be covered by regulation deadline by 31 December 2027. This offers the possibility for all 18 airports currently implementing Initial AOP and the 10 new airports covered by the regulation to plan and implement Family 2.2.2 in an orderly manner.

As most of airports mandated to implement iAOP by end 2023 are progressing well with its implementation, it could be expected that those airports concentrate on complying by end 2023 with iAOP and would prepare a joint project for extended AOP in the near future. To date, under a multi-stakeholder SDM action 8 airports, 2 ANSPS and the Network Manager have submitted a proposal to implement E-AOP (the BEACON project) by Dec 2027. The outcome of the bid is expected to be announced by CINEA by mid 2023.

2.2.2 Extended AOP

CP1 Target date	Implementation date	Total # of closed gaps	Total # of open gaps
December 2027	December 2027	0	31



Gap Implementation Progress

The chart shows the overall Family implementation status, taking into account all inputs coming from involved Stakeholders

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100% Full Deployment Achieved
- Not applicable

Stakeholder Implementation Status

- Completed with CEF Funding
- Completed without CEF Funding
- Fully covered by CEF Funding
- Ongoing with CEF Funding
- Ongoing without CEF Funding
- Planned
- Not Yet Planned
- Not applicable

Powered by EUROCONTROL

Airport	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	ANSP	Airport Operator
Amsterdam Schiphol	0	0	50	50	December 2027		
Athens Eleftherios Venizelos	0	0	100	0	December 2027		
Barcelona El Prat	0	0	100	0	December 2027		
Berlin Brandenburg	1	7	92	0	December 2027		
Brussels National	0	0	0	100			
Copenhagen Kastrup	0	0	0	100			
Dublin Airport	0	0	0	100			
Düsseldorf Airport	3	5	92	0	December 2027		
Frankfurt am Main	1	7	92	0	December 2027		
Geneva Airport	5	10	35	50	December 2027		
Hamburg Airport	1	7	50	42	December 2027		
Helsinki Vantaa	0	0	100	0	December 2027		
Lisbon Humberto Delgado	1	7	92	0	December 2027		
Lyon Saint-Exupéry	0	0	0	100			
Madrid Barajas	0	0	100	0	December 2027		
Málaga Costa del Sol	0	0	100	0	December 2027		
Milan Linate	0	0	100	0	December 2027		
Milan Malpensa	0	0	100	0	December 2027		
Munich Franz Josef Strauss	1	7	42	50	December 2027		
Nice Côte D'Azur	0	0	0	100			
Oslo Gardermoen	2	13	0	85	December 2027		
Palma de Mallorca Son Sant Joan	0	0	100	0	December 2027		
Paris Charles de Gaulle	0	0	100	0	December 2027		
Paris Orly	0	0	100	0	December 2027		
Prague Václav Havel	5	40	55	0	December 2027		
Rome Fiumicino	3	5	92	0	December 2027		
Stockholm Arlanda	0	0	50	50	December 2027		
Stuttgart Airport	1	7	50	42	December 2027		
Vienna Schwechat	0	0	100	0	December 2027		
Warsaw Chopin Airport	2	18	80	0	December 2027		
Zürich Kloten	0	0	58	42	December 2027		

Figure 7. Current status of implementation of Family 2.2.2

Deployment approach and synchronisation

To successfully deploy Family 2.2.2, stakeholders should focus on:

- Achieving all Deployment Milestones for ANSPs and Airport Operators listed in the SESAR Deployment Programme (SDP) 2022.
- Ensuring that envisaged multi-stakeholder's projects, as based on recent experience, will ensure more efficiency and cross-fertilisation among the participants to the implementation projects.
- Ensuring proper consideration and coordination with Family 2.2.1 initial AOP (iAOP) and using as reference material the ACI EUROPE guidance to compliance for iAOP, and for the extended AOP (E-AOP) which is under development (see Standards and Regulations in this document).
- Making sure that AF4 Families 4.2.2 Initial AOP/NOP Information Sharing, and 4.4.1 AOP/NOP integration, are duly considered during the development of the implementation projects, and that proper coordination is taking place with the counterpart implementing those families. Use the EUROCONTROL Network Manager reference material implementation guides and roadmaps (see Standardisation and Regulations in this document).
- The AF5 Families 5.4.1 Meteorological Information Exchange and 5.5.1 Cooperative Network Information Exchange are to be considered as interdependent with Families 2.2.1 and 2.2.2.
- Considering full coordination and cooperation with the EUROCONTROL Network Manager (NM).

The deployment of Airport Integration and Throughput Functionality shall be coordinated and synchronised among the airport stakeholders to reach the maximum network performance benefits. From a technical perspective, the deployment of targeted system and procedural changes shall be synchronised in order to ensure that the performance objectives are met this is key for the AOP/NOP integration, where the network performance benefits will grow with the number of airports exchanging AOP information with NM.

Performance benefits

The AOP is the principal source of information used and shared by all involved airport stakeholders. The extended AOP is the fundamental tool supporting the following four operational services:

- Steer Airport Performance Service
- Monitor Airport Performance service
- Manage Airport Performance service
- Perform Post-Operations Analysis service

by improving the overall operational efficiency and increasing resilience of the airport and the network to resist disruptions such as but not limited to, adverse weather conditions, closure of a runway, security alerts measuring airport performance (overall and individual operators).

SESAR Deployment Manager acknowledges that the existing CBA model reflects only the performance benefits of pure ATM processes, while the extended AOP aims to benefit the journey processes before and beyond the pure ATM processes. Extended AOP is considered to have a strong multiplier effect and benefit on the end-to-end service chain, so to large parts of the door-to-door journey. This cannot be reflected properly in the pure ATM KPIs on which the CBA is based. As stakeholders update their intentions, or accurate flight progress information is received, the extended AOP is refined and used to manage resources and coordinate operations. Integration with the NOP extends the scope and time horizon of planning activities to include air traffic demand and improved target time coordination for the whole 4D flight trajectory under a holistic service perspective, balancing airspace/airside with terminal/landside operations. The aim is to provide processes and tools to maintain airport performance in all operating conditions, and to share information with the wider network. Ultimately, the extended AOP makes airports more resilient to disruptions, allowing more efficient management of airport demand capacity balancing and operations during adverse weather conditions or any other circumstance that might jeopardize smooth operations. More seamless and smooth processes lead to higher predictability in operations thus minimizing the

negative impact on all stakeholders and ultimately the passenger. Through increased predictability in airport and network operations the extended AOP and the AOP management support tool(s) contributes to

- a better and more cost-efficient use of existing/ available network and airport resources (runways, taxiways, aprons, and terminal/landside), thus paying a significant contribution to efficiencies,
- as well as optimization of resources usage, in a more sustainable manner (greater environmental benefits).

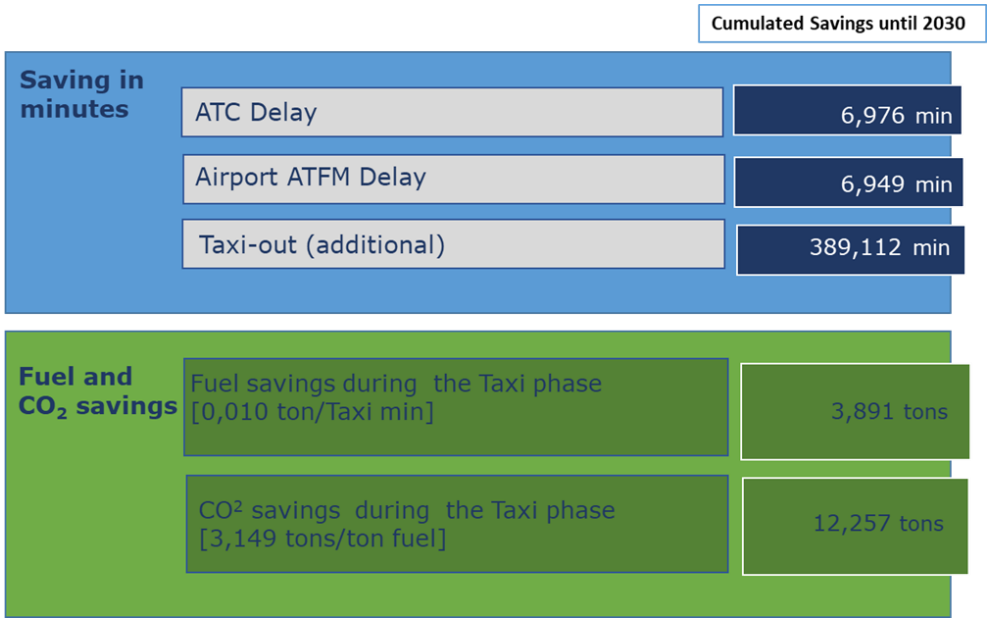
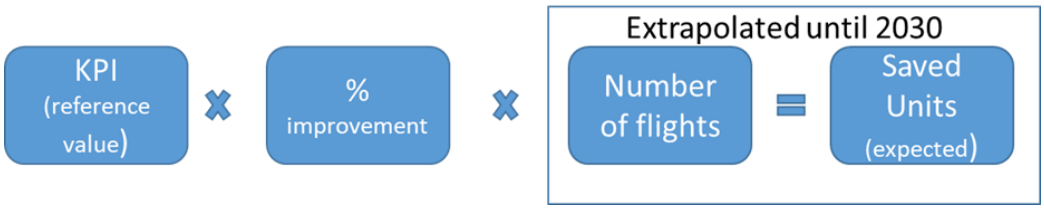


Figure 8 - Benefit expected for Family 2.2.2

The depicted savings shows the calculation result for 28 airports fulfilling the Family 2.2.2 plus the calculation of 10 new airports for Family 2.2.1, which is a prerequisite to gain the savings out of Family 2.2.2

Because the 10 additional airports (AGP, ATH, HAM, HEL, LIN, LIS, LYS, PRG, STR, and WAW) were published in the CP1 regulation EU 2021/116, these savings were calculated from 2019 onwards.

Methodology of performance calculation for AF2



The workflow above shows the calculation of savings for each KPI. The reference value for each KPI is stemming from PRU dashboards, where they are published on a monthly and yearly basis.

SDM estimates the impact after implementation of the respective ATM Family by multiplying the KPI reference value with the percentage of improvement, then with the related number of movements. The result are the expected saved units, cumulated until 2030.

2.3 AF3 – Flexible ASM and Free Route Airspace

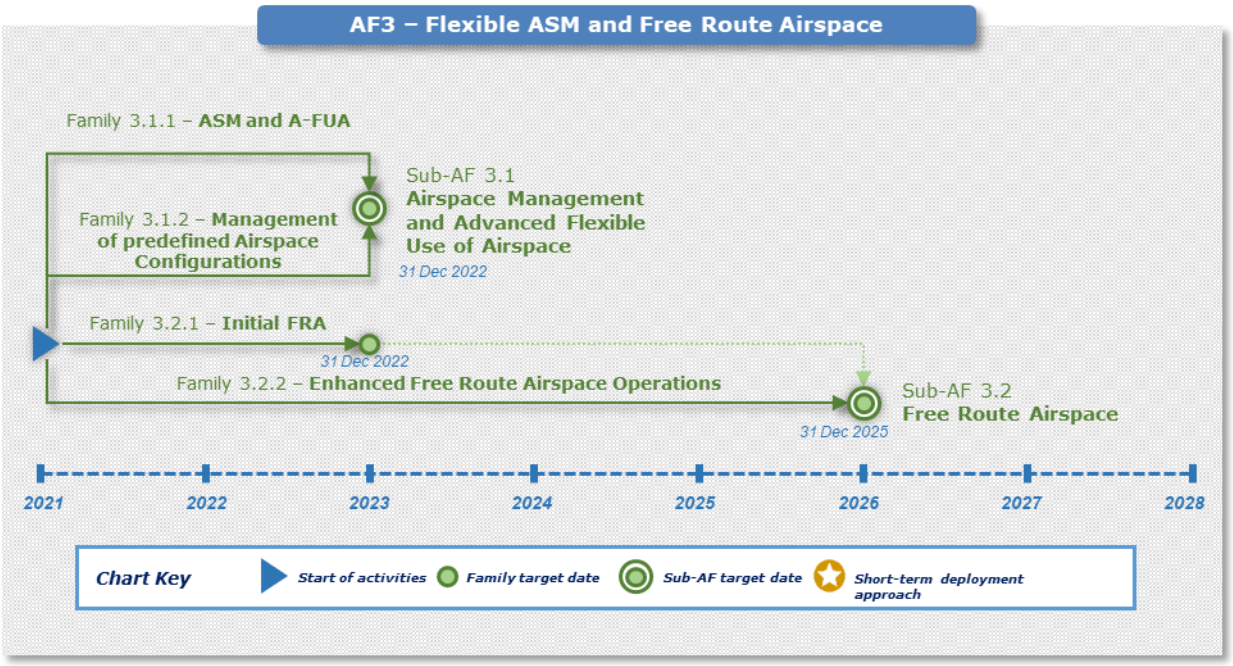


Figure 9. AF3 Short Term Deployment Approach

For AF3, Families 3.1.1, 3.1.2 and 3.2.1 have already passed the regulatory deadline. The only Family left to implement in the coming years is 3.2.2, Enhanced Free Route Airspace Operations. This functionality has already been implemented in several States and others have submitted implementation projects to extend their FRA operations. Thus, it is considered not necessary to prioritise this Family any longer.

2.4 AF4 – Network Collaborative Management

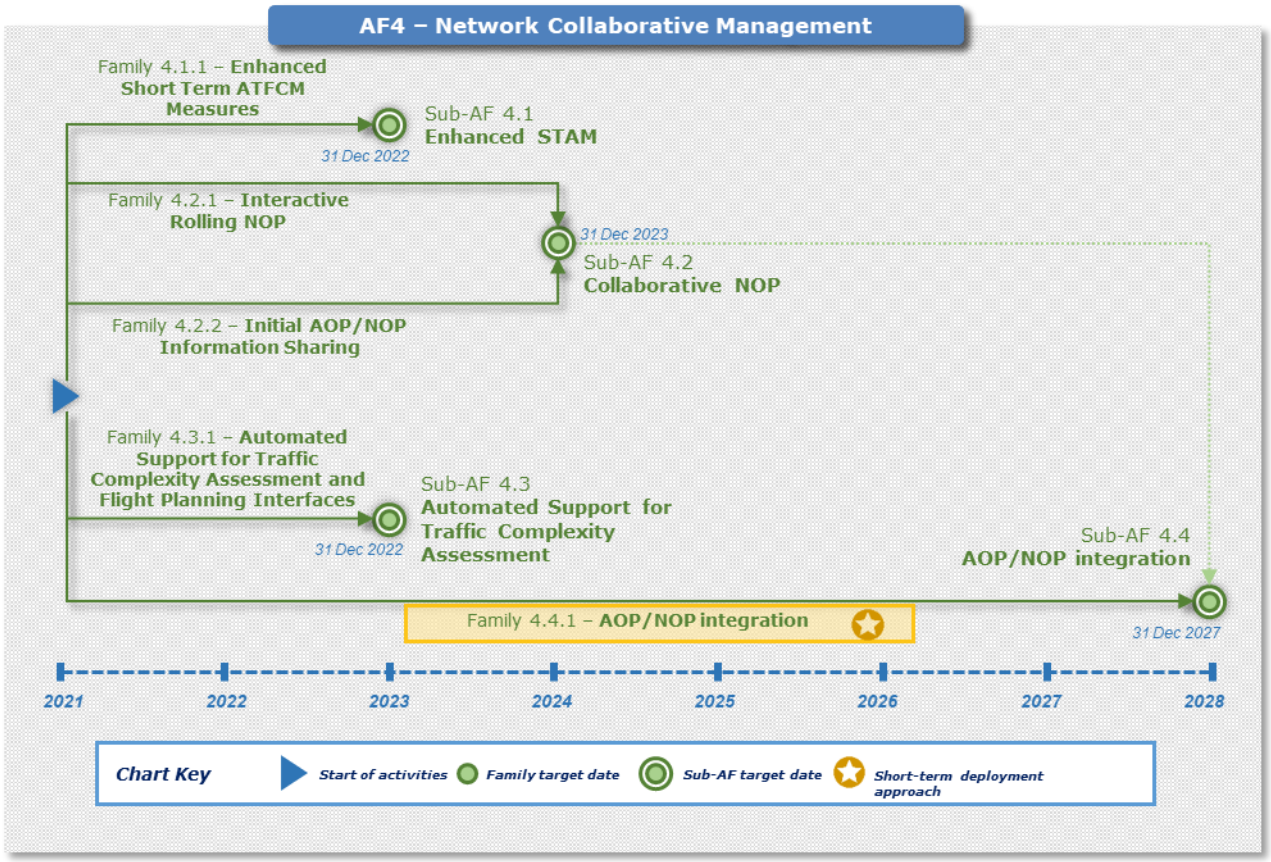


Figure 10. AF4 Short Term Deployment Approach

Introduction

The Short-Term Deployment Approach for AF 4 should focus on Family 4.4.1 AOP/NOP integration. Family 4.4.1 has to be seen as the continuation of Family 4.2.2.

Rationale

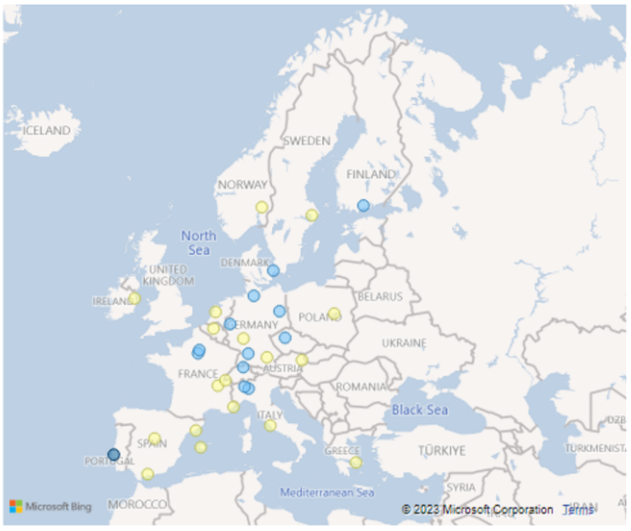
The integration of the airport planning is of utmost importance for the European ATM Network. In order to improve the European ATM network performance, notably capacity, predictability and flight efficiency through exchange, modification and management of planning details, there is a clear need for information sharing between the AOP and the NOP.

The initial AOP/NOP integration is the technical data layer for the collaborative NOP information sharing. It includes the provision to NM of different types of Departure Planning Information (DPI) and Arrival Planning Information (API); the integration of these information with the Network Operation Plan (NOP) provides a rolling picture of the overall network and airport situation used by stakeholders to prepare and update their plans and inputs to the network CDM processes, with a focus on the availability of shared operational planning and real-time data.

Considering that in the frame of initial AOP/NOP several projects are already on going with the majority of airports involved, this will pave the way for the implementation of Family 4.4.1 AOP/NOP integration, which implementation target date is 2027.

4.4.1 AOP/NOP Integration

CP1 Target date	Implementation date	Total # of closed gaps	Total # of open gaps
December 2027	December 2027	0	32



Gap Implementation Progress

The chart shows the overall Family implementation status, taking into account all inputs coming from involved Stakeholders

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100% Full Deployment Achieved
- Not applicable

Stakeholder Implementation Status

- Completed with CEF Funding
- Completed without CEF Funding
- Fully covered by CEF Funding
- Ongoing with CEF Funding
- Ongoing without CEF Funding
- Planned
- Not Yet Planned
- Not applicable

Powered by EUROCONTROL

Airport	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	ANSP	Airport Operator
Amsterdam Schiphol	0	0	80	20	December 2027		
Athens Eleftherios Venizelos	0	0	100	0	December 2027		
Barcelona El Prat	0	0	100	0	December 2027		
Berlin Brandenburg	3	25	20	52	December 2027		
Brussels National	0	0	0	100			
Copenhagen Kastrup	16	60	24	0	December 2027		
Dublin Airport	0	0	0	100			
Düsseldorf Airport	6	50	44	0	December 2027		
Frankfurt am Main	0	0	20	80	December 2027		
Geneva Airport	0	0	0	100			
Hamburg Airport	11	17	20	52	December 2027		
Helsinki Vantaa	10	86	4	0	December 2027		
Lisbon Humberto Delgado	71	24	5	0	December 2026		
Lyon Saint-Exupéry	0	0	0	100			
Madrid Barajas	0	0	100	0	December 2027		
Málaga Costa del Sol	0	0	100	0	December 2027		
Milan Linate	11	17	72	0	December 2027		
Milan Malpensa	11	17	72	0	December 2027		
Munich Franz Josef Strauss *	0	0	0	100			
Nice Côte D'Azur	0	0	0	100			
Oslo Gardermoen	0	0	48	52	December 2027		
Palma de Mallorca Son Sant Joan	0	0	100	0	December 2027		
Paris Charles de Gaulle	3	25	0	72	December 2027		
Paris Orly	3	25	0	72	December 2027		
Prague Václav Havel	6	50	24	20	December 2027		
Rome Fiumicino	0	0	20	80	December 2027		
Stockholm Arlanda	0	0	0	100			
Stuttgart Airport	11	17	20	52	December 2027		
Vienna Schwechat	0	0	100	0	December 2027		
Warsaw Chopin Airport	0	0	100	0	December 2027		
Zürich Kloten	7	67	25	0	December 2027		

** After the closure of the SDP Monitoring exercise, SDM received the communication that the ANSP is "Planned" in Family 4.4.1 AOP-NOP integration in Munich Airport*

	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation Date	Network Manager
Network Manager	10	0	0	90	December 2027	

Figure 11. Current status of implementation of Family 4.4.1

Deployment approach and synchronisation

The implementation projects addressing 4.4.1 AOP/NOP integration could be linked with those in Family 4.2.2 as their natural continuation. Notwithstanding, the gaps and DMs covered on each Family should be clearly described and assessed. The emphasis should be given on the provision by the airports of Extended Departure Planning Information and Arrival Planning Information and their integration within NOP. In addition, the airports need be capable to consume flight updates published by NM (NMB2B equivalent of FUM). Additional airports information like runway configurations, airport performance measurement might also need to be exchanged with NOP based on the bilaterally agreed protocol.

Concerning Family 4.4.1, special attention should be given to the definition of data for the extended AOP/NOP integration and testing and validation of airport interfaces with NM.

The integration of Airport Operation Plan (AOP) with Network Operation Plan (NOP) for optimisation and synchronisation of planning for big airports at the network level is paramount to increase the Network performance, also in combination with AF2 synchronisation aspects. Network Manager will provide tools for any users to be able to interact with it (such as the NOP portal and CHMI - CFMU Human Machine Interface -), even the non-European or very small airspace users and small airports or not constrained ANSPs.

It is very important that a full coordination at requirement level occurs so that data exchange requested by NM would be fully understood and ready by the other stakeholders in time. The synchronisation needs to be done in planning phase between the Network Manager, the airspace users, all the ANSP of the zone, and the main airports, and in execution phase between Network Manager and the ANSP, in coordination with the main airports and the airspace users.

Performance benefits

The integration of the airport planning will improve the European ATM network performance, notably capacity, predictability and flight efficiency through exchange, modification, and management of planning details.

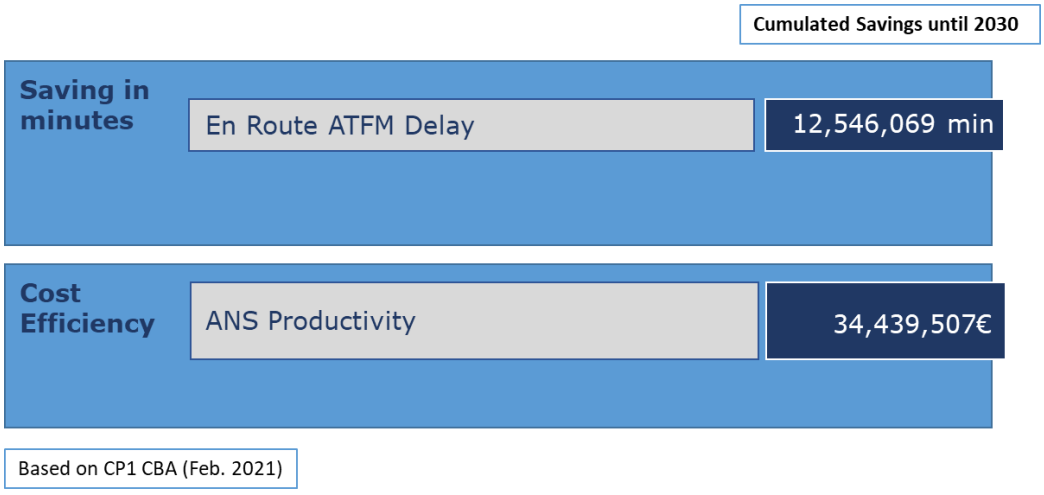


Figure 12 - Benefit expected for Family 4.4.1

Methodology of performance calculation for AF4

The savings for "en-route ATFM delays" (Capacity) are stemming from a Network simulation, whereas Capacity gains are calculated against a "do-nothing scenario", meaning the estimated savings are measured against the increase of delays when project implementations or procedure changes will not take place.

The tables of benefits depict therefore the cumulated savings.

2.5 AF5 – SWIM

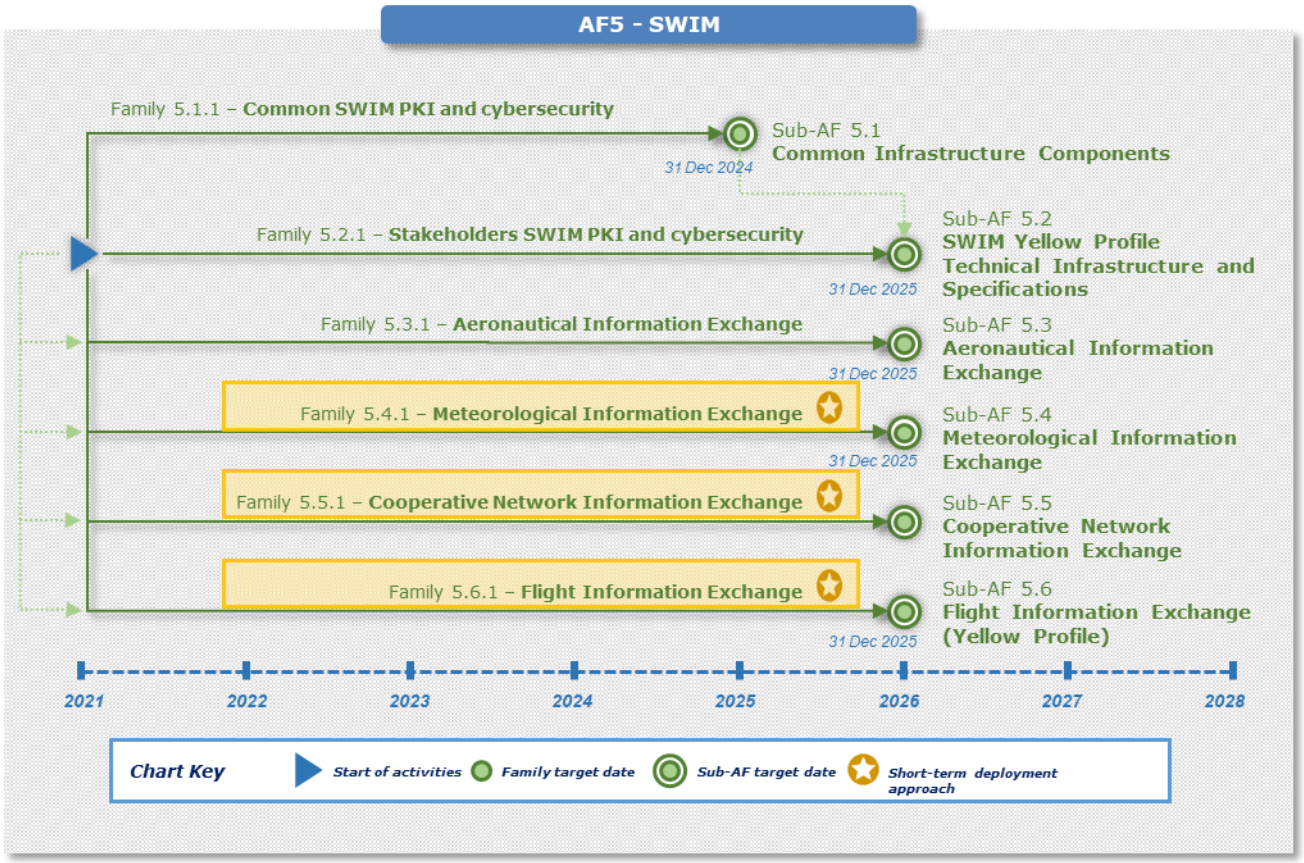


Figure 13. AF5 Short Term Deployment Approach

Introduction

The timely planning and implementation of CP1 SWIM services is paramount for an overall successful CP1 deployment because the full set of benefits from all ATM functionalities will be fully realized only once SWIM is implemented. As per the Regulation AF5 must be ready by 31 December 2025, therefore, by the end of 2023 there will be 2 years left to complete the implementation in all EATMN for all mandated stakeholders.

Rationale

Considering the significant progress by SWIM service providers in terms of completed and expected service implementations, it is suggested to focus the short-term deployment efforts on planning the proper implementation in the following Families:

Family 5.4.1: Met services are available in the SWIM registry and focus should be on the consumption of the existing services by the mandated users.

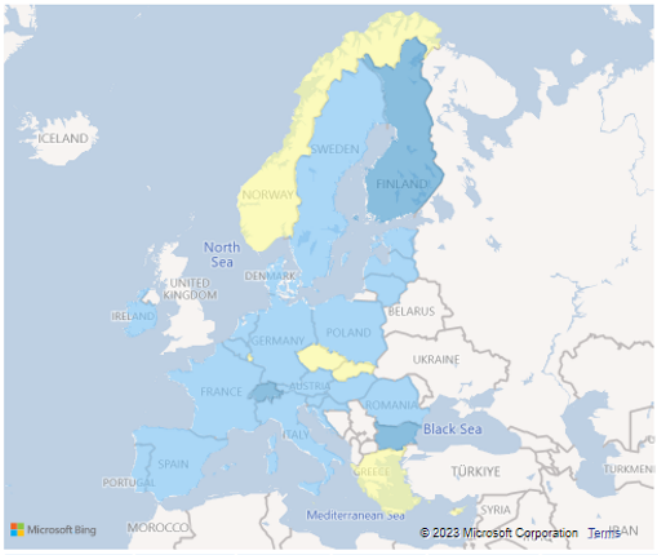
Family 5.5.1: All SWIM services are implemented and available in the SWIM registry, the focus should be on stakeholders' consumption of the NM B2B services and the move towards Automation in the ATFCM and Traffic complexity areas. Furthermore, it is also important for AOs to move towards SWIM in their DPI Management processes as part of the A-CDM processes.

Family 5.6.1: All related SWIM FF-ICE services are implemented and available in the SWIM registry but with a limited uptake so far, therefore a focus here to extend the operational use is paramount. This implementation will require work among AUs who will need a new or updated Flight planning system or ANSPs who are upgrading their FDP.

This will enable to put to a use the investment undergone by service providers and will enable the operational benefits of SWIM to be realized.

5.4.1 Meteorological Information Exchange

CP1 Target date	Implementation date	Total # of closed gaps	Total # of open gaps
December 2025	December 2027	0	31



Gap Implementation Progress

The chart shows the overall Family implementation status, taking into account all inputs coming from involved Stakeholders

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100% Full Deployment Achieved
- Not applicable

Stakeholder Implementation Status

- Completed with CEF Funding
- Completed without CEF Funding
- Fully covered by CEF Funding
- Ongoing with CEF Funding
- Ongoing without CEF Funding
- Planned
- Not Yet Planned
- Not applicable

Powered by EUROCONTROL

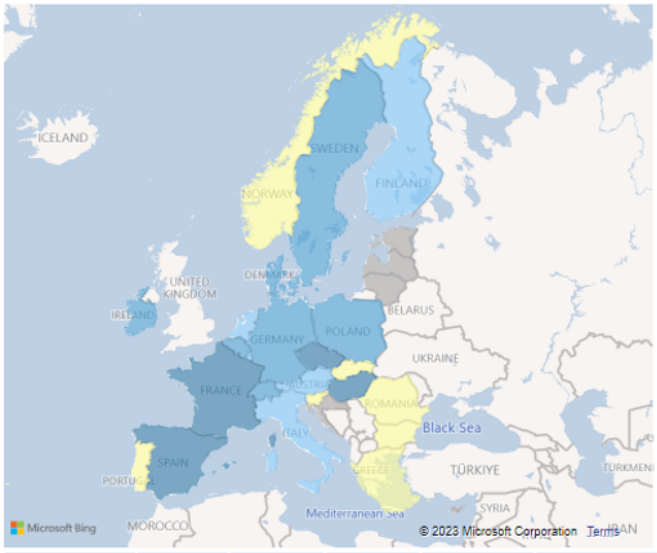
Country	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	ANSP	Airport Operator	MET
Austria	4	34	62	0	December 2027			
Belgium	2	19	8	71	December 2025			
Bulgaria	37	29	34	0	December 2025			
Croatia	12	54	7	27	December 2027			
Cyprus	0	0	0	100				
Czech Republic	0	2	70	28	December 2025			
Denmark	11	3	8	78	December 2027			
Estonia	2	18	18	62	December 2025			
Finland	27	15	58	0	December 2025			
France	8	64	27	1	December 2025			
Germany	6	50	9	35	December 2025			
Greece	0	0	0	100				
Hungary	4	34	62	0	December 2025			
Ireland	6	58	15	20	December 2027			
Italy	7	64	29	0	December 2025			
Latvia	0	4	13	82	December 2025			
Lithuania	2	22	75	0	December 2025			
Luxembourg	0	0	0	100				
Maastricht UAC	2	20	33	45	December 2025			
Malta	0	0	0	100				
Netherlands	15	41	44	0	December 2025			
Norway	0	3	2	95	December 2025			
Poland	1	13	85	0	December 2025			
Portugal	2	19	79	0	December 2027			
Romania	3	25	0	72	December 2025			
Slovak Republic	0	0	68	32	December 2025			
Slovenia	6	53	41	0	December 2025			
Spain	1	10	89	0	December 2025			
Sweden	8	22	35	35	December 2027			
Switzerland	33	14	20	33	December 2025			

	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	Network Manager
Network Manager	0	0	0	100		

Figure 14 - Current status of Family 5.4.1

5.5.1 Cooperative Network Information Exchange

CP1 Target date	Implementation date	Total # of closed gaps	Total # of open gaps
December 2025	December 2025	2	24



Gap Implementation Progress

The chart shows the overall Family implementation status, taking into account all inputs coming from involved Stakeholders

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100% Full Deployment Achieved
- Not applicable

Stakeholder Implementation Status

- Completed with CEF Funding
- Completed without CEF Funding
- Fully covered by CEF Funding
- Ongoing with CEF Funding
- Ongoing without CEF Funding
- Planned
- Not Yet Planned
- Not applicable

Powered by EUROCONTROL

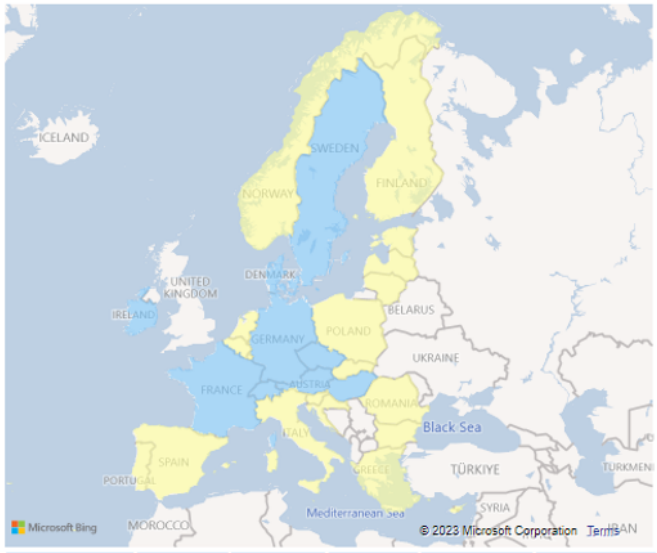
Country	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	ANSP	Airport Operator
Austria	10	65	25	0	December 2025		
Belgium	26	12	15	47	December 2025		
Bulgaria	0	0	100	0	December 2025		
Croatia	0	0	0	0			
Cyprus	0	0	0	0			
Czech Republic	57	13	30	0	December 2025		
Denmark	30	45	25	0	December 2025		
Estonia	0	0	0	0			
Finland	1	11	88	0	December 2025		
France	64	4	32	0	December 2025		
Germany	26	32	16	26	December 2025		
Greece	0	0	0	100			
Hungary	51	9	40	0	December 2025		
Ireland	45	30	25	0	December 2025		
Italy	18	26	56	0	December 2025		
Latvia	0	0	0	0			
Lithuania	0	0	0	0			
Luxembourg	21	9	10	60	December 2025		
Maastricht UAC	100	0	0	0	December 2021		
Malta	0	0	0	100			
Netherlands	3	5	92	0	December 2025		
Norway	0	0	50	50	December 2025		
Poland	28	2	70	0	December 2025		
Portugal	0	0	100	0	December 2025		
Romania	0	0	40	60	December 2025		
Slovak Republic	0	0	13	87	December 2025		
Slovenia	0	0	100	0	October 2025		
Spain	57	8	35	0	December 2025		
Sweden	34	41	25	0	December 2025		
Switzerland	42	13	15	30	December 2025		

	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	Network Manager
Network Manager	100	0	0	0	December 2021	

Figure 15. Current status of Family 5.5.1

5.6.1 Flight Information Exchange

CP1 Target date	Implementation date	Total # of closed gaps	Total # of open gaps
December 2025	December 2029	1	30



Gap Implementation Progress

The chart shows the overall Family implementation status, taking into account all inputs coming from involved Stakeholders

- 0%
- 1-25%
- 26-50%
- 51-75%
- 76-99%
- 100% Full Deployment Achieved
- Not applicable

Stakeholder Implementation Status

- Completed with CEF Funding
- Completed without CEF Funding
- Fully covered by CEF Funding
- Ongoing with CEF Funding
- Ongoing without CEF Funding
- Planned
- Not Yet Planned
- Not applicable

Powered by EUROCONTROL

Country	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	ANSP
Austria	3	5	92	0	December 2027	
Belgium	0	0	0	100		
Bulgaria	0	0	100	0	December 2025	
Croatia	0	0	100	0	December 2027	
Cyprus	0	0	0	100		
Czech Republic	8	30	62	0	December 2025	
Denmark	3	5	92	0	December 2027	
Estonia	0	0	75	25	December 2025	
Finland	0	0	100	0	December 2025	
France	7	9	84	0	December 2025	
Germany	3	17	13	67	December 2025	
Greece	0	0	0	100		
Hungary	3	10	62	25	December 2025	
Ireland	3	5	92	0	December 2027	
Italy	0	0	100	0	December 2025	
Latvia	0	0	0	100		
Lithuania	0	0	100	0	December 2025	
Luxembourg	0	0	0	100		
Maastricht UAC	0	0	0	100		
Malta	0	0	33	67	December 2025	
Netherlands	0	0	75	25	December 2025	
Norway	0	0	100	0	December 2029	
Poland	0	0	100	0	December 2025	
Portugal	0	0	88	12	December 2027	
Romania	0	0	0	100		
Slovak Republic	0	0	0	100		
Slovenia	0	0	75	25	December 2025	
Spain	0	0	100	0	December 2025	
Sweden	3	5	92	0	December 2027	
Switzerland	4	4	0	92	December 2024	

	Completed (%)	Ongoing (%)	Planned (%)	Not Yet Planned (%)	Implementation date	Network Manager
Network Manager	100	0	0	0	December 2022	

Figure 16. Current status of Family 5.6.1

Deployment approach and synchronisation

The Implementation of SWIM services is a transversal activity, which shall be coordinated and synchronised as much as possible with all the ATM Functionalities because delays in implementing SWIM compliant data-exchange could potentially impact network performance.

There should be a shift from Service provision to cover also the SWIM Service Consumption and usage of the data. The consumption of available services has not yet been implemented and this needs to be prioritized.

Performance benefits

SWIM enables seamless information access and exchange between all providers and users of ATM information and is an enabler for many ATM functionalities in the CP1. SWIM enhances the operational performance delivered by the functionalities compared to what can be achieved by the legacy information exchanges and - being enabler for digitization - can generate cost efficiencies at the individual stakeholder level (e.g., by means of automatization, decommission and lower maintenance costs). Furthermore, SWIM will ensure global interoperability and standardisation in the European ATM network.

2.6 AF6 – Initial Trajectory Information Sharing

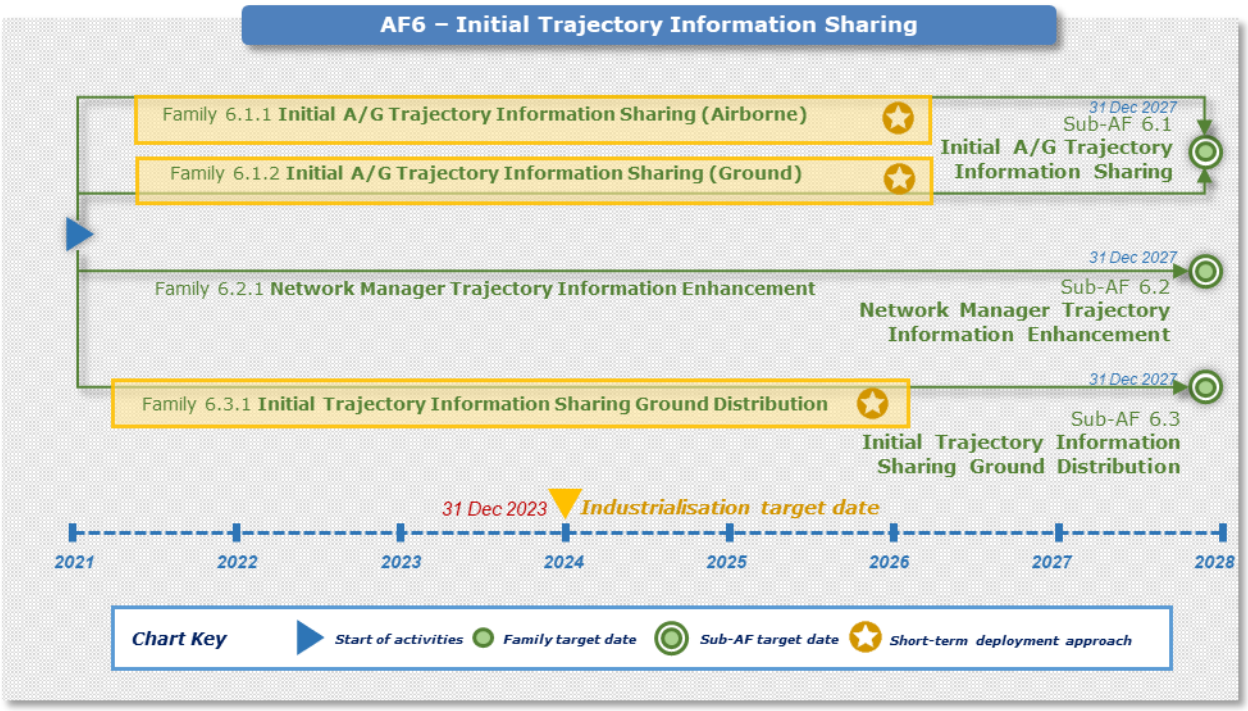


Figure 17. AF6 Short Term Deployment Approach

All the Families in AF6 are subject to an industrialisation target date at the end of 2023. At that time, the readiness for implementation and the availability of all the standards needed will be assessed by EC with the support of EASA. EASA has established in February 2023 an CP1 Industrialisation Forum, inviting SDM, NM, S3JU and EUROCAE, to coordinate all the related activities required to pass successfully the industrialisation target date. These activities will cover the completion and availability of the required standards, the validation of PJ38 and the assessment of the certification process.

At the same time, and whilst the ADS-C Common Service (ACS) is the proposed approach described in the SDP to meet the requirements of AF6, SDM is working with EUROCONTROL/NM and several stakeholders, including the manufacturing industry, in line with the Operational Excellence Programme requirements, to generate the technical specifications and supporting material that will support the implementation of the ACS. These technical specifications will be published by EUROCONTROL after a public consultation during the second half of 2023.

With this in mind, and considering that by end of 2023 there will be enough information to assess the industrialisation target date and decide whether AF6 remains in the CP1, SDM is proposing this year to start prioritising certain Families in AF6. Provided the industrialisation target date is passed successfully and AF6 remains in the scope of CP1, this would allow the operational stakeholders (ANSPs, AUs and NM) to start planning the implementation of ADS-C/EPP, ideally following the recommended centralised approach (ACS), with the elaboration of implementation projects that could begin in 2024 after the industrialisation target date has been assessed and a firm decision has been taken by EC.

The main activity to be monitored for Family 6.1.1 is the equipage. Aircraft operators shall ensure the procurement of ADS-C/EPP functionalities and their compliance to ATS B2 services (for aircraft affected by the mandate). Therefore, the implementation process by aircraft operators regarding the future aircraft configuration definition needs to start in a timely manner.

CP1 only mandates to forward-fit the new aircraft from 31 December 2027 onwards, but CP1 also requires in AF6 to have a "*A reliable, fast and efficient air/ground communication infrastructure must support initial trajectory information sharing*", and considering the capacity issues that VDL M2 may suffer in the near future, it is also recommended, while fostering development and testing of new technologies (SATCOM,

LDACS, Hyperconnected ATM), to consider the implementation of new technologies and any initiative aiming at optimizing AOC traffic to alleviate the VDL M2 congestion. This could be done in the short term with the introduction of Multilink and SATCOM to complement VDL M2. At the same time, having a centralised ADS-C service would reduce the number of links between the airborne and the ground systems, hence the recommendation to support the ADS-C Common Service for Family 6.1.1, and the participation of all ANSP to anticipate a harmonised ground deployment.

Family 6.3.1 addresses the ground distribution of the EPP data. Based on the SESAR results and the work being done in the OEP, the EPP data could be distributed through a SWIM service (based on the EUROCONTROL SWIM specification). This is considered to be the most efficient mechanism, which would also harmonise the ground distribution of EPP across EU, and therefore will be used by ADS-C Common Service if this approach is followed. Although not ideal, for those ANSPs who opt to be disconnected from the ADS-C Common Service, they can implement their own dedicated SWIM service for widespread dissemination of the EPP information they download, preferably following the specifications produced by the OEP. Other legacy distribution mechanisms like AMHS and FMTP remain available, although they are not standardized and are pre point-to-point connection and thus will be far less efficient than a SWIM service.

Multilink implementation roadmap

As described above, the implementation of Multilink is seen as a key factor supporting the deployment of AF6, enabling the operational use of complementary technologies. Additionally, with a decision to deploy ATN/IPS gateways on the ground, this will allow accommodating OSI and IPS based aircraft.

Multilink would allow the use of a variety of communication links: the next generation of Satellite Communications (SATCOM NG); the new L-band Digital Aeronautical Communications System (LDACS); and "hyperconnected" ATM supporting the use of Commercial Off-The-Shelf (COTS) technologies on top of AOC. The latter will make use of, for example, 4G/5G commercial terrestrial networks on ground as well as new commercial satellite communications constellations but which may not provide services in protected aviation radiofrequency spectrum. The multilink concept will enable the seamless management of multiple digital datalink technologies. It will combine technologies to support safety-critical applications and will integrate open connectivity opportunities (e.g. 5G).

SDM, together with EUROCONTROL and the SESAR3 Joint Undertaking, is leading a working group composed of various experts from research and innovation, manufacturing industry, Communication Service Providers and operational stakeholders such as Airlines and Air Navigation Service Providers. The workgroup is developing an implementation plan that synchronises FCI deployment. As part of the short-term deployment approach for AF6, it is also recommended to focus on the multilink implementation, in particular with the introduction of SATCOM to complement VDL M2 and thus support the operational use of ADS-C/EPP.

3. Performance Assessment & CBA methodology

In the SESAR Deployment Programme, an update of the monetization factors will be performed whenever deemed necessary, in particular following the release of a new version of the EUROCONTROL "Standard Inputs for Cost and Benefits Analyses".

For Fuel and CO2 price, in the CP1 CBA developed in 2020 the actual prices were used for the past years (2014-2019) and forecasts from official sources were used for the future (2020-2030):

Year	2014	2015	2016	2017	2018	2019	2020-2030
Fuel Price	698 €	487 €	370 €	458 €	571 €	560 €	780 €
CO_2 Price	7.20 €	8.22 €	6.55 €	8.09 €	24.63 €	21.69 €	22.00 €

In the Deployment Programme, a continuous update of fuel and CO2 price is performed to give the most realistic and up-to-date view of the benefits: after each calendar year-end, once the actual past fuel and CO2 prices and more updated forecasts are available, the above assumptions are reviewed.

For example, the fuel and CO2 prices currently in use at start of 2023 to update implementation projects benefits are the following:

Year	2014	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024-2030
Fuel Price	698 €	487 €	370 €	458 €	571 €	560 €	332 €	543 €	1040 €	1000 €	780 €
CO2 Price	7.20 €	8.22 €	6.55 €	8.09 €	24.63 €	21.69 €	32 €	53 €	82 €	97 €	97 €

Enrichment of the Performance framework

To a vast extent, KPIs that have been used so far have been driven by the content of the Performance and Charging scheme IR. Recent studies have shown the need to broaden the performance framework in order to fully reveal the benefits ATM/ANS can deliver. It is of particular importance, as, for the next decade, improvement in operations (along with the ramped-up usage of SAF) is a vital ingredient to accompany the decarbonisation trajectory.

This led in particular to the work of the ATM/ANS Environmental Transparency Working Group, the report of which presenting other indicators (in particular to assess the vertical efficiency of flights) has been released.

Such new performance indicators have the potential to enrich the performance framework and are being investigated by the SDM.

EUROCONTROL has introduced its long-term traffic forecast in November 2020 with three different scenarios. Scenario 2 with a 5-year recovery period compared to the 2019 traffic level was foreseen as the most acceptable scenario and was used by SDM for the CP1 CBA.

To perform the Deployment Programme Performance Assessment and CBA analysis providing the full picture of the performance impact from the ongoing and completed projects, an update of the traffic scenario is performed when necessary, in particular following the release of new traffic forecasts by STATFOR. The traffic forecast reference is systematically mentioned in the Performance section of the Execution Progress Report (EPR) delivered each year to the European Commission.

In its latest edition (November 2022), the EPR Performance section was based on the 'base' scenario from STATFOR released in October 2021, with traffic recovery in 2024 (Figure below)[4].

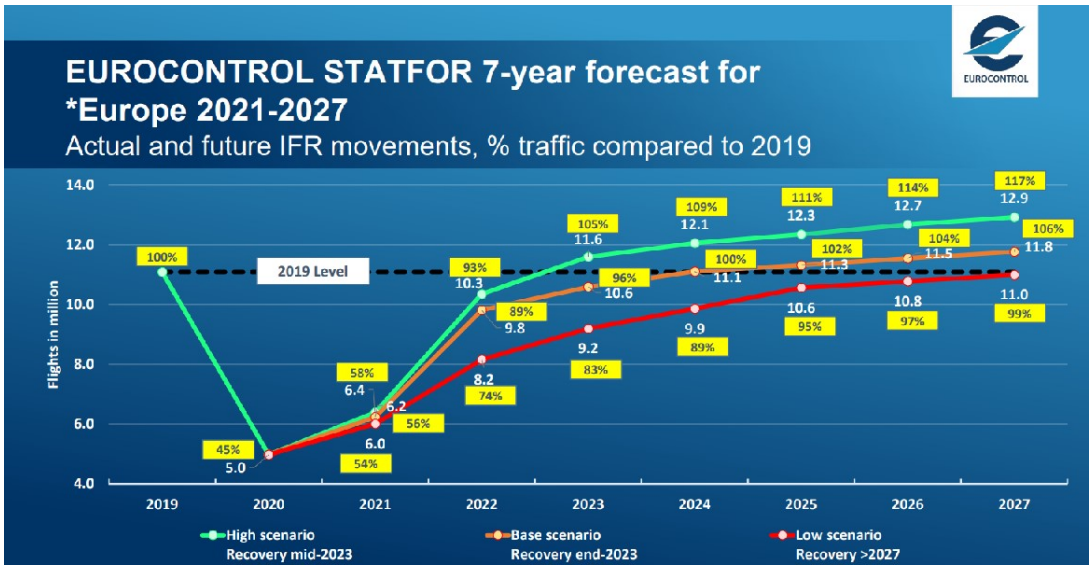


Figure 18. 2020-2027 Europe traffic forecast by STATFOR (October 2021)

[4] The new forecast released by Eurocontrol in October 2022, showing minor differences, came too late to be effectively retained in the EPR 2022.

4. Standardisation and Regulation support to CP1 deployment

The modifications implemented in this chapter compared with the last version (2022) are the following:

- Solution PJ.15-02 "E-AMAN common service" has been removed from V3 table in Family 5.6.1 as agreed with the S3JU.
- Delivery dates for all documents have been reviewed and updated according to the last published version of A-RDP.

The **Standardisation and Regulation** supporting material is a key document, developed with the primary objective of providing an accurate **snapshot** of the current **state of play of Standards and Regulations** mapped with the 25 Families in the SESAR Deployment Programme (SDP). It also provides information on the on-going work related to supporting material and regulation.

The Annex is a **living document that will be regularly updated** throughout SESAR Deployment Programme's lifetime.

The presentation of information included within Standardisation and Regulation supporting material follows the "ATM Concept Lifecycle Model", where V0-V3 are covered by R&D under responsibility of SESAR 3 Joint Undertaking (S3JU). The subsequent V4 (Industrialisation) includes development of material supporting deployment and development of products by manufacturing industry and Very Large-Scale Demonstrations (VLD) are part of V3 but conducted during V4 as support to industrialisation. Deployment starts during or after V4, in V5, and its coordination is under SESAR Deployment Manager (SDM) responsibility.

The Standardisation and Regulation supporting material is intended to be used as a common reference for the implementation of the SESAR Deployment Programme and a useful instrument for liaising with organisations and bodies responsible for developing guidance material, specifications, standards (all normally referred to as "standards"), certification documents, Acceptable Means of Compliance (AMC) as well as regulations.

Different approval methodologies are applied in aviation. For airborne equipment, "certification" is used based on specifications, standards and "Technical Specification Orders" (TSO). Certified equipment can be installed and used on board aircraft, on the condition that installation on board such aircraft has been certified as well. Ground system constituents are accompanied by "declaration of conformity or suitability for use" issued by the manufacturers. The service provider presents a "declaration of verification of systems", a demonstration of compliance with the regulation, to a competent authority i.e. the National Supervisory Authority (NSA), which oversees the service provider to ensure that safety requirements are met. In some cases, the regulation is very prescriptive with precise requirements, but in most cases only guidance is provided.

The Standardisation and Regulation supporting material presented in this document is structured as follows:

- **Essential material (green tables):** The documents listed in the green tables are, according to SESAR Deployment Manager's point of view, essential for the deployment of the Families according to the requirements described in the SESAR Deployment Programme.
- **Supporting material (yellow tables):** The documents listed in the yellow tables are, according to SESAR Deployment Manager's point of view, supporting and guidance material for the deployment of the Families according to the requirements described in the SESAR Deployment Programme.

Early implementations before formal standards and regulatory material are available is possible subject to NSA approval. However, it might be necessary to adjust the implementations once formal standards and regulatory material become available at the end of V4.

The content of the Standardisation and Regulation supporting material is based on:

- European Commission Implementing Regulation No 116/2021, Common Project 1 (CP1), repealing Commission Implementing Regulation (EU) No 716/2014 known as the Pilot Common Project (PCP), and especially the related indicative Roadmap with respect to standardisation and regulation needs);
- the ATM Master Plan references including the Integrated Roadmap Dataset 20;
- SESAR Solutions, i.e. deliverables from SESAR R&D mapped to ATM Master Plan Level 2 Operational Improvements (OIs);
- related plans or further development according to SESAR 2020 plans; and
- the Rolling Work Plan version 20 developed by the European ATM Standardisation Coordination Group (EASCG), summarising on-going and planned activities within bodies involved in development of standards and regulation.

The information reported in the document is elaborated and analysed by SDM in coordination with **EASA, EDA, EUROCONTROL, NM and SJU**, as well as with **EUROCAE and ESOs** which contribution and inputs were pivotal towards the finalisation of the Standardisation and Regulation supporting material.

In order to limit the volume and increase the readability of the Standardisation and Regulation supporting material, some high-level reference documents setting up the "legislative" framework are not included in the following tables. It should be noted that these documents are however always applicable and should be taken into account when introducing new and changing existing services. Such high-level reference documents include amongst others:

Regulations:

- EASA Basic Regulation No 2018/1139.
- Single European Sky (SES) legislation.
- Implementing Regulation (EU) No 2017/373 laying down common requirements for providers of air traffic management, air navigation services and other air traffic management network functions and their oversight, repealing Regulation (EC) No 482/2008, Implementing Regulations (EU) No 1034/2011, Regulation (EU) No 1035/2011 and Regulation (EU) No 2016/1377 and amending Regulation (EU) No 677/2011. The regulation is constructed of a "cover regulation" with thirteen annexes addressing different areas and it is applicable from 2 January 2020. However, the part related to "data service providers" is applicable from 1 January 2019.
- Commission Regulation (EU) No 139/2014 of 12 February 2014 laying down requirements and administrative procedures related to aerodromes pursuant to Regulation (EC) No 216/2008 of the European Parliament and of the Council Text with EEA relevance. This regulation is amended by Commission Implementing Regulation (EU) 2020/469 as referenced in the following line.
- Commission Implementing Regulation (EU) 2020/469 of 14 February 2020 amending Regulation (EU) No 923/2012, Regulation (EU) No 139/2014 and Regulation (EU) 2017/373 as regards requirements for air traffic management/air navigation services, design of airspace structures and data quality, runway safety and repealing Regulation (EC) No 73/2010.
- Commission Implementing Regulation (EU) No 409/2013 of 3 May 2013 on the definition of common projects, the establishment of governance and the identification of incentives supporting the implementation of the European Air Traffic Management Master Plan European Commission Implementing

Regulation No 116/2021, Common Project 1 (CP1), amending Commission Implementing Regulation (EU) No 409/2013 and repealing Commission Implementing Regulation (EU) No 716/2014 known as the Pilot Common Project (PCP).

- Directive 2013/40/EU of the European Parliament and of the Council of 12 August 2013 on attacks against information systems.
- The Network and Information Security (NIS) Directive (2016/1148).

Standards:

- ISO 27000 family of standards, focused on information security matters, as listed in the Cybersecurity section.
- ISO 28000 Specification for security management systems for the supply chain.

Guidelines:

- CANSO Cyber Security and Risk Assessment Guide.

It should also be mentioned that Airlines Electronic Engineering Committee (AEEC) is developing material defining "form, fit and function" of airborne equipment published as ARINC documents. Not all of these documents are included in the Standardisation and Regulation supporting material. The ARINC 660-B "CNS/ATM Avionics Architectures Supporting NEXTGEN/SESAR Concepts" provides an overview of the expected impact on airborne equipment when deploying the SESAR solutions.

Furthermore, considering that global interoperability is a paramount for aviation, SESAR deployment is strongly linked to the Global Air Navigation Plan (GANP) defined by ICAO, which is related to the European ATM Master Plan. Therefore, some high-level ICAO reference documents, which may be considered in the deployment of the families, are listed below:

- ICAO Annexes to the Chicago Convention.
- ICAO Annex 17 – Aviation Security (safeguards civil aviation against unlawful interference and recommends protection of critical information and communication systems).
- ICAO IMP SARPs on AIRM.
- ICAO PANS-IM covering AIRM (TBD).
- ICAO Doc 9985 – Restricted (Air Traffic Management Security Manual).
- ICAO Doc 8973 – Restricted (Aviation Security Manual).

4.1 Cybersecurity

In order to complement Cybersecurity guidance section in the SESAR Deployment Programme Planning View, this section provides a list of regulations, standards and guidance documents specifically related to cybersecurity aspects, which are sometimes targeting a specific audience but may inspire good practises across the whole community.

For States and "operators of essential services"

- The Network and Information Security (NIS) Directive (2016/1148) requests Member States to identify "operators of essential services" by 9 November 2018 and lists for air transport the following organisations: air carriers, airport managing bodies and traffic management control operators. The NIS directive also requests the States to ensure that "operators of essential services" take:

  1. *"Appropriate and proportionate technical and organisational measures to manage the risks posed to the security of network and information systems which they use in their operations. Having regard to the state of the art, those measures shall ensure a level of security of network and information systems appropriate to the risk posed".*

  2. *"Appropriate measures to prevent and minimise the impact of incidents affecting the security of the network and information systems used for the provision of such essential services, with a view to ensuring the continuity of those services".*

- EASA Basic Regulation 2018/1139 of July 4th, 2018, highlights in article 4:

"Interdependencies between the different domains of aviation safety, and between aviation safety, cyber security and other technical domains of aviation regulation".

- ECAC Doc 30. ECAC Policy Statement in the field of Civil Aviation Facilitation.

For all Air Navigation Service Providers:

- Commission Implementing Regulation (EU) No 2017/373 of 1st of March 2017 laying down common requirements for providers of air traffic management/air navigation services and other air traffic management network functions and their oversight, in its requirement "ATM/ANS.OR.D.010 Security Management" states that:

  - *(a) Air navigation services and air traffic flow management providers and the Network Manager shall, as an integral part of their management system as required in point ATM/ANS.OR.B.005, establish a security management system […].*

  - *(d) Air navigation services and air traffic flow management providers and the Network Manager shall take the necessary measures to protect their systems, constituents in use and data and prevent compromising the network against information and cyber security threats which may have an unlawful interference with the provision of their service.*

- Commission Implementing Regulation (EU) No 2023/203 lays down rules for the identification and management of information security risks in aviation organizations and aviation competent authorities, including EASA.

- ED-205 "Process standard for Air Traffic Management/Air Navigation Services (ATM/ANS) ground system security aspects for certification/declaration".
- CEN EN 16495 "Information security for organisations supporting civil aviation" builds on the structure of the ISO/IEC 27000 Family - Information security management systems.
- ICAO Doc 9985 – Restricted (Air Traffic Management Security Manual).

For all stakeholders:

- ICAO Annex 17 – Aviation Security (safeguards civil aviation against unlawful interference and recommends protection of critical information and communication systems).
- ICAO Doc 8973 – Restricted (Aviation Security Manual).
- General Data Protection Regulation (GDPR) (Regulation (EU) No 2016/679) on the protection of natural persons with regard to the processing of personal data and on the free movement of such data.
- Regulation 2019/2019/881 on ENISA (the European Union Agency for Cybersecurity) and on information and communications technology cybersecurity certification.
- ITU X.1205 "Overview of Cybersecurity".
- ISO 27000 family of standards are focused on information security matters.
- ISO 27001 - Information technology — Security techniques — Information security management systems — Requirements.
- ISO 27002 - Information technology — Security techniques — Code of practice for information security management.
- ISO 27003 - Information Technology — Security techniques — Information security management system implementation guidance.
- ISO 27004 - Information technology — Security techniques — Information security management — Measurement.
- ISO 27005 - Information technology — Security techniques — Information security risk management.
- ISO 27006 - Information technology — Security techniques — Requirements for bodies providing audit and certification of information security management systems.
- NIST Cybersecurity Framework.
- ISA/IEC 62443 – Industrial Automation and Control Systems (IACS) security.

4.2 ATM Functionality 1 - Extended Arrival Management and Integrated AMAN/DMAN in the High-Density Terminal Manoeuvring Areas

Family 1.1.1 – Arrival Manager extended to en-route airspace

EOC: Airport and TMA performance

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#05 "Extended Arrival Management (AMAN) horizon"	TS-0305-A	V3 – SESAR Release 4 (2014)
VLDs		**Date**
PJ.25 XSTREAM "Cross Border SESAR Trials for Enhanced Arrival Management"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
API Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published
ED-254 MASPS covering the Extended horizon AMAN upstream coordination service	EUROCAE	Published
AMAN Information Extension to en-route Sectors – Concept of Operations; Edition 1.0, 5/06/2009	EUROCONTROL	Published
EUROCONTROL Concept of Operations for Network Manager Support to Advanced Arrival Management Edition 1.0 (24/10/2014)	EUROCONTROL/NM	Published
Network Strategy Plan (NSP): SO 4/5	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
SPEC-0106 On-Line Data Interchange (OLDI) Edition 5.0, Community Specification CS 2019/C 31/06	EUROCONTROL	Published (waiting to be listed in OJEU)
SPEC-0106 On-Line Data Interchange (OLDI) Edition 5.1	EUROCONTROL	Q1/2023
SPEC-0107 EUROCONTROL Specification for ATS Data Exchange Presentation (ADEXP) Edition 3.3, Community Specification	EUROCONTROL	Published (waiting to be listed in OJEU)
SPEC-0107 EUROCONTROL Specification for ATS Data Exchange Presentation (ADEXP), Edition 3.4	EUROCONTROL	Q2/2023
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9426 Air Traffic Services Planning Manual	ICAO	Published
Guidance Manual on Airport Traffic Synchronisation	ICAO	TBD

SDM Deployment Assessment	
Target Date	01/2024

V3 achieved and wave-2 of VLDs are planned in late 2022, result/outcome is expected to be published in Q1 2023.

Initial deployment is based on bilateral agreements, implemented utilising legacy protocols (OLDI AMA message). Extended AMAN need to be SWIM compatible (compliant when SWIM made available). Guidance material ED-254 MASPS and SWIM yellow profile covering the Extended horizon AMAN upstream coordination service certainly be useful for supporting coordination between further upstream ATS units (that can be located in different States) and in situations when more than one airport is affected.

Family 1.2.1 – AMAN/DMAN Integration

EOC: Airport and TMA performance

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#54 "Flow-based integration of arrival and departure management"	TS-0308	V3 – SESAR Release 4 (2014)
#106 "DMAN Baseline for integrated AMAN DMAN"	TS-0201	V3 – SESAR Release 1 (2011)
PJ.02-08-01 "Integrated Runway Sequence for full traffic Optimization on Single and Multiple Runway Airports"	TS-0301	V3 – SESAR Release 9 (2019)
VLDs		**Date**
VLD03 W2 SORT		SESAR Release 12 (2022)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
API Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published
DPI Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
B0-RSEQ Improved Traffic Flow through Runway Sequencing (AMAN/DMAN)	ICAO	Published
B1-RSEQ Improved Airport Operations through Departure, Surface and Arrival Management	ICAO	Published
B2 - RSEQ Linked AMAN/DMAN	ICAO	Published
Manual on Global Performance of the Air Navigation System (Doc 9883)	ICAO	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9426 Air Traffic Services Planning Manual	ICAO	Published
Doc 9994 Manual on Airborne Surveillance Applications	ICAO	Published

SDM Deployment Assessment	
Target Date	12/2027

V3 achieved and second phase of VLDs were planned in 2020 but delayed due COVID and postponed to 2022. Currently, VLD 03 Work Package 2 is in progress to be completed by 31/12/2022 and result and outcomes are awaited in Q1 2023.

"Flow-based integration of arrival and departure management" solution is validated as well as "baseline DMAN for integrated AMAN-DMAN" and "Integrated Arrival Departure Management for Full Traffic Optimisation on the Runway" These were validated in a series of live and fast time simulation trials with a particular focus on delay reduction. The operational concept supports DMAN integration with arrival manager (AMAN) and provides a baseline for further development of AMAN/DMAN integration procedures.

4.3 ATM Functionality 2 – Airport Integration and Throughput

Family 2.1.1 – Departure Management Synchronised with Pre-Departure Sequencing

EOC: Airport and TMA performance

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#53 "Pre-Departure Sequencing supported by Route Planning"	TS-0202	V3 - SESAR Release 4 (2014)
#106 "DMAN Baseline for integrated AMAN DMAN"	TS-0201	V3 - SESAR Release 1 (2011)
VLDs		**Date**
PJ.28 IAO "Integrated Airport Operations"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2021/116 of 01 February 2021	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
EN 303 212 (V1.1.1) Airport Collaborative Decision Making (A-CDM) Community Specification (Communication 2010/C 168/04)	ETSI	Published
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED-87E MASPS for Advanced Surface Movement Guidance and Control Systems (A-SMGCS)	EUROCAE	Published
ED-141 Minimum Technical Specification for the Airport Collaborative Decision Making (Airport-CDM)	EUROCAE	Published
ED-141A MASPS for Airport CDM Systems	EUROCAE WG-111	Q4/2023

Guidance Material / Specifications / Standards		
References	**References**	**References**
ED-145 Airport-CDM Interface Specification	EUROCAE	Published
ED-145A Airport CDM Interface Specification	EUROCAE WG-111	Q2/2024
Specification on A-CDM	EUROCONTROL	Q4/2023
Airport CDM Implementation Manual Version 5	EUROCONTROL	Published
SPEC-171 Edition 2.0 Specification for Surface Advanced-Surface Movement Guidance and Control System (A-SMGCS)	EUROCONTROL	Published
SPEC-171 Edition 3.0 Specification for Surface Advanced-Surface Movement Guidance and Control System (A-SMGCS)	EUROCONTROL	Q3/2024

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
EN 303 213-1 CS on ASMGCS Part 1: surveillance service including external interfaces (V 2.1.1)	ETSI	Published
EN 303 213-2 CS on ASMGCS Part 2: airport safety support service (V 2.1.1)	ETSI	Published
EN 303 213-3 CS on ASMGCS Part 3: deployed cooperative sensor including its interfaces (V 2.1.1)	ETSI	Published
EN 303 213-4-1 A-SMGCS; Part 4: Community Specification for a deployed non-cooperative sensor including its interfaces; Sub-part 1: Generic requirements for non-cooperative sensor (V 1.1.1)	ETSI	Published
EN 303 213-4-2 A-SMGCS; Part 4: Community Specification for a deployed non-cooperative sensor including its interfaces; Sub-part 2: Specific requirements for a deployed Surface Movement Radar sensor (V 1.1.1)	ETSI	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9426 Air Traffic Services Planning Manual	ICAO	Published
Doc 9830, Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual	ICAO	Published
Guidance Manual on Airport Traffic Synchronisation	ICAO	TBD
B0 - RSEQ Improved Traffic Flow through Runway Sequencing (AMAN/DMAN)	ICAO	Published
B1 - RSEQ Improved Airport Operations through Departure, Surface and Arrival Management	ICAO	Published
B2-RSEQ Linked AMAN/DMAN	ICAO	Published
B3 - RSEQ Integrated AMAN/DMAN/SMAN	ICAO	Published

SDM Deployment Assessment	
Target Date	31/12/2022

No further supporting material needed other than already existing/being developed.

The existing (and identified in the Standardisation and Regulation Support to CP1 document) standardisation material and regulations are sufficient to deploy the Family in a harmonised way.

Family 2.2.1 – Initial AOP

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#21 "Airport Operations Plan and AOP-NOP Seamless Integration"	AO-0801-A	V3 - SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2021/116 of 01 February 2021	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
EN 303 212 (V1.1.1) Airport Collaborative Decision Making (A-CDM) Community Specification (Communication 2010/C 168/04)	ETSI	Published
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Specification on A-CDM	EUROCONTROL	Q4/2023
DPI Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
API Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published
DPI & FUM Implementation Roadmap Edition 2.2/15-05-2022	EUROCONTROL/NM	Published
Departure Planning Information (DPI) & Arrival Planning Information (API) implementation roadmap Ed2.3/15-05-2022	EUROCONTROL/NM	Published
EUROCONTROL A-CDM webpage	EUROCONTROL	Published
Airport CDM Implementation Manual Version 5	EUROCONTROL	Published
Aeronautical Information Exchange Model AIXM Edition 5.1.1	EUROCONTROL	Published
Aeronautical Information Exchange Model AIXM Edition 5.2	EUROCONTROL	Q1/2023
NM B2B Reference Manuals	EUROCONTROL/NM	Published
NM B2B Services webpage	EUROCONTROL/NM	Published
Airport Network Integration - concept for establishment of an Airport Operations Plan (AOP) Ed1.1 – 07/11/2018	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
iAOP-NOP_Implementation_Guide_v1.02	ACI EUROPE	Published
Guidance on Compliance to the CP1 (IR 2021/116) - For the Initial AOP and information sharing of the initial AOP with the Network Operations Plan	ACI EUROPE	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED-141 Minimum Technical Specification for the Airport Collaborative Decision Making (Airport-CDM)	EUROCAE	Published
ED-141A MASPS for Airport CDM Systems	EUROCAE WG-111	Q4/2023
ED-145 Airport CDM Interface Specification	EUROCAE	Published
ED-145A Airport CDM Interface Specification	EUROCAE WG-111	Q2/2024
ED-146 Guidelines for Test and Validation related to A-CDM interoperability	EUROCAE	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED-146A Guidelines for Test and Validation Related to Airport CDM Interoperability	EUROCAE WG-111	Q2/2024

SDM Deployment Assessment	
Target Date	31/12/2023
V3 completed in 2016 The existing (and identified in the Standardisation and Regulation Support to CP1 document) standardisation material and regulations are sufficient to deploy the Family in a harmonised way.	

Family 2.2.2 - Extended AOP

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#21 "Airport Operations Plan and AOP-NOP Seamless Integration"	AO-0801-A AO-0802-A AO-0803 DCB-0310	V3 - SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2021/116 of 01 February 2021	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Guidance on Compliance to the CP1 (IR 2021/116) - For the Initial AOP and information sharing of the initial AOP with the Network Operations Plan	ACI EUROPE	Published
Guidance to the CP1 (IR 2021/116) - For the Extended AOP and integration of the E-AOP with the Network Operations Plan	ACI EUROPE	Published
Specification on A-CDM	EUROCONTROL	Q4/2023
DPI Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
API Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published
DPI & FUM Implementation Roadmap Edition 2.2/15-05-2022	EUROCONTROL/NM	Published
Departure Planning Information (DPI) & Arrival Planning Information (API) implementation roadmap Edition 2.3/15-05-2022	EUROCONTROL/NM	Published
EUROCONTROL A-CDM webpage	EUROCONTROL	Published
NM B2B Services webpage	EUROCONTROL/NM	Published
NM B2B Reference Manuals	EUROCONTROL/NM	Published
Airport Network Integration - concept for establishment of an Airport Operations Plan (AOP) Ed1.1 – 07/11/2018	EUROCONTROL	Published
E-AOP-NOP Implementation Guide	ACI EUROPE	Q3/2023, subject to EUROCONTROL delivery of information by ad-hoc EUROCONTROL AOP-NOP working group
AOP Practical Guide	ACI EUROPE	Q3/2023

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
EN 303 212 (V1.1.1) Airport Collaborative Decision Making (A-CDM) Community Specification (Communication 2010/C 168/04)	ETSI	Published
Network Strategy Plan (NSP): SO 5/2	EUROCONTROL/NM	Published

SDM Deployment Assessment	
Target Date	31/12/2027
The existing (and identified in the Standardisation and Regulation Support to CP1 document) standardisation material and regulations should become sufficient to deploy the Family in a harmonised way as from Q4/2023.	

Family 2.3.1 – Airport Safety Nets

EOC: Airport and TMA performance

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#02 "Airport Safety Nets for controllers: conformance monitoring alerts and detection of conflicting ATC clearances"	AO-0104-A	V3 - SESAR Release 5 (2016)
#04 "Enhanced Traffic Situational Awareness and Airport Safety Nets for the vehicle drivers"	AO-0105 AO-0204	V3 - SESAR Release 5 (2016)
VLDs		**Date**
PJ.28 IAO "Integrated Airport Operations"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2021/116 of 01 February 2021	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
EN 303 213-1 CS on ASMGCS Part 1: surveillance service including external interfaces (V 2.1.1)	ETSI	Published
EN 303 213-2 CS on ASMGCS Part 2: airport safety support service (V 2.1.1)	ETSI	Published
EN 303 213-3 CS on ASMGCS Part 3: deployed cooperative sensor including its interfaces (V 2.1.1)	ETSI	Published
EN 303 213-4-1 A-SMGCS; Part 4: Community Specification for a deployed non-cooperative sensor including its interfaces; Sub-part 1: Generic requirements for non-cooperative sensor (V 1.1.1)	ETSI	Published
EN 303 213-4-2 A-SMGCS; Part 4: Community Specification for a deployed non-cooperative sensor including its interfaces; Sub-part 2: Specific requirements for a deployed Surface Movement Radar sensor (V 1.1.1)	ETSI	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED-116 MOPS for Surface Movement Radar Sensor Systems for use in A-SMGCS	EUROCAE	Published
ED-117A MOPS for Mode S MLAT Systems for use in A-SMGCS	EUROCAE	Published
ED-163 Safety, Performance and Interoperability Requirements document for ADS-B Airport Surface surveillance application (ADS-B APT)	EUROCAE	Published
ED-102B / DO-260B MOPS for 1090 MHz Extended Squitter Automatic Dependent Surveillance Broadcast (ADS-B) and Traffic Information Services Broadcast (TIS-B)	EUROCAE / RTCA	Published
SPEC-171 Edition 2.0 Specification for Surface Advanced-Surface Movement Guidance and Control System (A-SMGCS)	EUROCONTROL	Published
SPEC-171 Edition 3.0 Specification for Surface Advanced-Surface Movement Guidance and Control System (A-SMGCS)	EUROCONTROL	Q3/2024
European Action Plan for the Prevention of Runway Incursions (EAPPRI)	EUROCONTROL	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 7030/5, (EUR/NAT) Regional Supplementary Procedures, Section 6.5.6 and 6.5.7	ICAO	Published
Doc 9426 Air Traffic Services Planning Manual	ICAO	Published
Doc 9830, Advanced Surface Movement Guidance and Control Systems (A-SMGCS) Manual	ICAO	Published
Doc 9871, Technical Provisions for Mode S Services and Extended Squitter	ICAO	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9924, Aeronautical Surveillance Manual	ICAO	Published
Guidance Manual on Airport Traffic Synchronisation	ICAO	Published
B0 - RSEQ Improved Traffic Flow through Runway Sequencing (AMAN/DMAN)	ICAO	Published
B1 - RSEQ Improved Airport Operations through Departure, Surface and Arrival Management	ICAO	Published
B2-RSEQ Linked AMAN/DMAN	ICAO	Published
B3 - RSEQ Integrated AMAN/DMAN/SMAN	ICAO	Published

SDM Deployment Assessment	
Target Date	31/12/2025
V3 completed in 2016 and VLDs in 2020. The existing (and identified in the Standardisation and Regulation Support to CP1 document) standardisation material and regulations are sufficient to deploy the Family in a harmonised way.	

4.4 ATM Functionality 3 - Flexible Airspace Management and Free Route Airspace

Family 3.1.1 – ASM and A-FUA

EOC: Fully dynamic and optimised airspace

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#31 "Variable profile military reserved areas and enhanced (further automated) civil-military collaboration"	AOM-0206-A AOM-0202-A	V3 - SESAR Release 5 (2016)
#66 "Automated Support for Dynamic Sectorisation"	CM-0102-A	V3 - SESAR Release 2 (2012)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Regulation (EC) No 2150/2005 of 23 December 2005 laying down common rules for the flexible use of airspace	European Commission	Published
Commission Implementing Regulation (EU) 2019/123 of 24 January 2019 laying down detailed rules for the implementation of air traffic management (ATM) network functions and repealing Commission Regulation (EU) No 677/2011	European Commission	Published
Commission Implementing Regulation (EU) (EU) 2018/1139 on common rules in the field of civil aviation and establishing a European Union Aviation Safety Agency, and amending Regulations (EC) No 2111/2005, (EC) No 1008/2008, (EU) No 996/2010, (EU) No 376/2014 and Directives 2014/30/EU and 2014/53/EU of the European Parliament and of the Council, and repealing Regulations (EC) No 552/2004 and (EC) No 216/2008 of the European Parliament and of the Council and Council Regulation (EEC) No 3922/91	European Commission	Published

Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
Communication 2009/C 2196/05 Community Specifications for the application of the Flexible Use of Airspace (FUA)	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-166 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level Part I-II	EUROCONTROL	Published
SPEC-166 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level - Part I Edition 1.1	EUROCONTROL	Q4/2023
SPEC-179 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level - Part II Edition 1.1	EUROCONTROL	Q1/2023

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-0112 Specification for the application of the Flexible Use of Airspace (FUA)	EUROCONTROL	Published
LARA (Local and sub-Regional Airspace Management Support System)	EUROCONTROL	Published
Advanced FUA Concept	EUROCONTROL	Published
Civil-military ATM Performance Framework	EUROCONTROL	Published
NOP Protected Portal User Guide	EUROCONTROL/NM	Published
NOP Public Portal User Guide	EUROCONTROL/NM	Published
Aeronautical Information Exchange Model AIXM Edition 5.1.1	EUROCONTROL	Published
Aeronautical Information Exchange Model AIXM Edition 5.2	EUROCONTROL	Q1/2023
European Route Network Improvement Plan (ERNIP) Part 3 - Airspace Management Handbook - Guidelines for Airspace Management	EUROCONTROL/NM	Published
Flexible Use of Airspace (FUA) AMC/CADF Operations Manual	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Network Strategy Plan 2020-2029	EUROCONTROL/NM	Published
GUID-185 Guidelines for ASM Support Systems Interfaces Implementation	EUROCONTROL	Published

SDM Deployment Assessment	
Target Date	31/12/2022

The target date for the deployment of this Family has just passed.

According to the reports received from the States, most of them are currently exchanging ASM data through the NM systems, while carrying out, in parallel, the implementation of a local ASM tool. Few states, on the other hand, reported that they are already exclusively working with their own ASM tool.

Overall, this snapshot of the current situation allows SDM to confirm that stakeholders are fully aware of what the next AF5 objectives on ASM will be.

About ASM-ATC interoperability, AF3 allowed to manual trigger the reserved areas on Air Traffic Controllers' CWPs. To be compliant with AF5 requirements, however, this interoperability has to be physically deployed as SWIM compliant.

Family 3.1.2 – Management of Predefined Airspace Configurations

EOC: Fully dynamic and optimised airspace

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#31 "Variable profile military reserved areas and enhanced (further automated) civil-military collaboration"	AOM-0206-A AOM-0202-A	V3 - SESAR Release 5 (2016)
#66 "Automated Support for Dynamic Sectorisation"	CM-0102-A	V3 - SESAR Release 2 (2012)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Regulation (EC) No 2150/2005 of 23 December 2005 laying down common rules for the flexible use of airspace	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-166 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level Part I-II	EUROCONTROL	Published
SPEC-166 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level - Part I Edition 1.1	EUROCONTROL	Q4/2023
SPEC-179 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level - Part II Edition 1.1	EUROCONTROL	Q1/2023

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-0112 Specification for the application of the Flexible Use of Airspace (FUA)	EUROCONTROL	Published
LARA (Local and sub-Regional Airspace Management Support System)	EUROCONTROL	Published
Advanced FUA Concept	EUROCONTROL	Published
European Route Network Improvement Plan (ERNIP) Part 3 - Airspace Management Handbook - Guidelines for Airspace Management	EUROCONTROL/NM	Published
Flexible Use of Airspace (FUA) AMC/CADF Operations Manual	EUROCONTROL/NM	Published
Network Strategy Plan 2020-2029	EUROCONTROL/NM	Published
NM B2B web services	EUROCONTROL/NM	Published
ATFCM User's Manual	EUROCONTROL/NM	Published
ATFCM Operations Manual	EUROCONTROL/NM	Published
CHMI ATFCM Reference Guide	EUROCONTROL	Published
CHMI ATFCM Map Reference Guide	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
CHMI ASM Function Reference Guide	EUROCONTROL	Published
CHMI (via internet) Installation Guide	EUROCONTROL	Published

SDM Deployment Assessment	
Target Date	31/12/2022

The target date for the deployment of this Family has just passed.

Most of the States are using NM systems. Despite this, the ideal and most recommended solution, with a view to increasingly automate and synchronise the sharing of information, would be to establish a link between the various ATM systems involved.

Family 3.2.1 – Initial FRA

EOC: Fully dynamic and optimised airspace

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#32 "Free Route through the use of Direct Routing"	AOM-0500	V3 - SESAR Release 5 (2016)
#33 "Free Route through Free Routing for Flights both in cruise and vertically evolving above a specified Flight Level"	AOM-0501	V3 - SESAR Release 5 (2016)
#66 "Automated Support for Dynamic Sectorisation"	CM-102-A	V3 - SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2019/123 of 24 January 2019 laying down detailed rules for the implementation of air traffic management (ATM) network functions and repealing Commission Regulation (EU) No 677/2011	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
European Route Network Improvement Plan (ERNIP) Part 1 - European Airspace Design Methodology - Guidelines	EUROCONTROL/NM	Published
European Route Network Improvement Plan (ERNIP) Part 2 - European ATS Route Network	EUROCONTROL/NM	Published
European Route Network Improvement Plan (ERNIP) Part 3 - Airspace Management Handbook	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
European Route Network Improvement Plan (ERNIP) Part 4 - Route Availability Document User's Manual	EUROCONTROL/NM	Published
NM Flight Planning Requirements - Guidelines	EUROCONTROL/NM	Published
Network Strategy Plan 2020-2029	EUROCONTROL/NM	Published
IFPS User's Manual	EUROCONTROL/NM	Published (Continuously maintained)
SPEC-0107 EUROCONTROL Specification for ATS Data Exchange Presentation (ADEXP) Edition 3.3, Community Specification	EUROCONTROL	Published
SPEC-0107 EUROCONTROL Specification for ATS Data Exchange Presentation (ADEXP), Edition 3.4	EUROCONTROL	Q2/2023
SPEC-0106 On-Line Data Interchange (OLDI) Edition 5.0, Community Specification CS 2019/C 31/06	EUROCONTROL	Published (waiting to be listed in OJEU)
SPEC-0106 On-Line Data Interchange (OLDI) Edition 5.1	EUROCONTROL	Q1/2023
SPEC-139 Specification for Medium-Term Conflict Detection (MTCD) Edition 2.0	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-142 Specification for Monitoring aids (MONA)	EUROCONTROL	Published
SPEC-143 Specification for Trajectory Prediction	EUROCONTROL	Published
GUID-161 Guidelines for area proximity warning (APW) Part I-III	EUROCONTROL	Published

SDM Deployment Assessment	
Target Date	31/12/2022

The target date for the deployment of this Family has just passed.

Deployment successfully completed everywhere.
Now States are focussing on the full National FRA, on FRA connectivity with TMAs and on the Cross-border dimension, as required by Family 3.2.2.

Family 3.2.2 – Enhanced Free Route Airspace Operations

EOC: Fully dynamic and optimised airspace

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#32 "Free Route through the use of Direct Routing for flights both in cruise and vertically evolving in cross ACC/FIR borders and in high complexity environments"	AOM-0500	V3 - SESAR Release 5 (2016)
#65 "User Preferred Routing"	AOM-0500	V3 - SESAR Release 5 (2016)
#33 "Free Route through the use of Free Routing for flights both in cruise and vertically evolving in cross ACC/FIR borders and within permanently low to medium complexity environments"	AOM-0501	V3 - SESAR Release 5 (2016)
#66 "Automated Support for Dynamic Sectorisation"	CM-0102-A	V3 - SESAR Release 5 (2016)
PJ.06-01 "Optimized traffic management to enable Free Routing in high and very high complexity environments"	AOM-0505	V3 - SESAR Release 9 (2020)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
European Route Network Improvement Plan (ERNIP) Part 1 - European Airspace Design Methodology – Guidelines	EUROCONTROL/NM	Published
European Route Network Improvement Plan (ERNIP) Part 2 - European ATS Route Network	EUROCONTROL/NM	Published
European Route Network Improvement Plan (ERNIP) Part 3 - Airspace Management Handbook	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
European Route Network Improvement Plan (ERNIP) Part 4 - Route Availability Document User's Manual	EUROCONTROL/NM	Published
Network Strategy Plan 2020-2029	EUROCONTROL/NM	Published
IFPS User's Manual	EUROCONTROL/NM	Published (Continuously maintained)
SPEC-0107 EUROCONTROL Specification for ATS Data Exchange Presentation (ADEXP) Edition 3.3, Community Specification	EUROCONTROL	Published
SPEC-0107 EUROCONTROL Specification for ATS Data Exchange Presentation (ADEXP), Edition 3.4	EUROCONTROL	Q2/2023
SPEC-0106 On-Line Data Interchange (OLDI) Edition 5.0, Community Specification CS 2019/C 31/06	EUROCONTROL	Published (waiting to be listed in OJEU)
SPEC-0106 On-Line Data Interchange (OLDI) Edition 5.1	EUROCONTROL	Q1/2023
SPEC-139 Specification for Medium-Term Conflict Detection (MTCD) Edition 2.0	EUROCONTROL	Published
SPEC-142 Specification for Monitoring aids (MONA)	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-143 Specification for Trajectory Prediction	EUROCONTROL	Published
GUID-161 Guidelines for area proximity warning (APW) Part I-III	EUROCONTROL	Published
European Route Network Improvement Plan (ERNIP) Part 1 - European Airspace Design Methodology – Guidelines	EUROCONTROL/NM	Published
European Route Network Improvement Plan (ERNIP) Part 2 - European ATS Route Network	EUROCONTROL/NM	Published

SDM Deployment Assessment	
Target Date	31/12/2025

FRA enhancement includes the deployment of Final FRA, FRA connectivity with TMAs and Cross-border FRA with at least one neighbouring State.
All three dimensions are making good progress.
The dimension that needs to be pushed the most in order to meet the regulation target date is the one concerning the implementation of the Cross-border FRA. Reason why last CEF Call 2022 envisaged multi-stakeholder projects in favour of the completion of the cross-border FRA.

4.5 ATM Functionality 4 – Network Collaborative Management

Family 4.1.1 – Enhanced Short Term ATFCM Measures

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#17 "Advanced Short ATFCM Measures (STAM)"	DCB-0308	V3 – SESAR Release 5 (2016)
VLDs		**Date**
PJ.24 NCM "Network Collaborative Management"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2019/123 of 24 January 2019 laying down detailed rules for the implementation of air traffic management (ATM) network functions	European Commission	Published
Commission Implementing Regulation (EU) No 716/2014 has been repealed by the now established "Commission Implementing Regulation (EU) 2021/116 (CP1)" published on 01/02/2021	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
STAM Operational Concept (October 2015)	EUROCONTROL/NM	Published
ATFCM Operations Manual	EUROCONTROL/NM	Published
NM B2B Reference Manuals	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9971 Manual on Collaborative Air Traffic Flow Management (ATFM part)	ICAO	Published
Network Strategy Plan (NSP): SO 2/3, SO 4/2 and SO 4/5	EUROCONTROL/NM	Published

SDM Deployment Assessment	
Target Date	31/12/2022

Due to COVID 19 crises, the STAM implementation has faced some delay. Nowadays the implementation is in progress. Mainly linked to the NM Functionality for traffic complexity (occupancy count) which is provided by CIFLO (CHMI interface for FMP). The connection is available via the standard token used by FMP. Documentation is sufficient to deploy STAM in a harmonised way.

Family 4.2.1 – Interactive Rolling NOP

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#20 "Collaborative NOP for Step 1"	DCB-0103-A	V3 – SESAR Release 5 (2016)
#18 "CTOT and TTA"	DCB-0208	V3 – SESAR Release 5 (2016)
VLDs		**Date**
PJ.24 NCM "Network Collaborative Management"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Regulation (EU) No 255/2010 of 25 March 2010 laying down common rules on air traffic flow management	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Collaborative NOP	EUROCONTROL/NM	Published
ATFCM Operations Manual	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9971 Manual on Collaborative Air Traffic Flow Management (ATFM part)	ICAO	Published
NOP User Guide; Edition 26.0. Date:07JUNE 2022	EUROCONTROL/NM	Published
Network Strategy Plan (NSP): SO 2/1, SO 2/2, SO 2/3, SO 4/2 and SO 4/5	EUROCONTROL/NM	Published

SDM Deployment Assessment	
Target Date	31/12/2023

Implementation in progress. Mainly link with Network Manager releases. Still some validation in progress for management of target times. Documentation continuously maintained by Network Manager to ensure harmonised implementation.

Family 4.2.2 – Initial AOP/NOP Information Sharing

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#20 "Collaborative NOP for Step 1"	DCB-0103-A	V3 – SESAR Release 5 (2016)
#21 "Airport Operations Plan and AOP-NOP Seamless Integration"	AO-0801-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2019/123 of 24 January 2019 laying down detailed rules for the implementation of air traffic management (ATM) network functions and repealing Commission Regulation (EU) No 677/2011	European Commission	Published
Commission Regulation (EU) No 255/2010 of 25 March 2010 laying down common rules on air traffic flow management	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
DPI Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
API Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL/NM	Published
DPI & FUM Implementation Roadmap Edition 2.2/15-05-2022	EUROCONTROL/NM	Published
NM B2B Services webpage	EUROCONTROL/NM	Published
NM B2B Reference Manuals	EUROCONTROL/NM	Published
iAOP-NOP Implementation Guide	EUROCONTROL/ACI Europe	Published
Guidance on Compliance to the CP1 (IR 2021/116) - For the Initial AOP and information sharing of the initial AOP with the Network Operations Plan	ACI EUROPE	Published
Departure Planning Information (DPI) & Arrival Planning Information (API) implementation roadmap Edition 2.3/15-05-2022	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9971 Manual on Collaborative Air Traffic Flow Management (ATFM part)	ICAO	Published
Specification on A-CDM	EUROCONTROL	Q4/2023
EUROCONTROL A-CDM webpage	EUROCONTROL	Published
NOP User Guide; Edition 26.0. Date:07JUNE 2022	EUROCONTROL/NM	Published
Network Strategy Plan (NSP): SO 4/4 SO 5/2	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Airport CDM Implementation - The Manual	EUROCONTROL/NM	Published
Airport Network Integration - concept for establishment of an Airport Operations Plan (AOP) Ed1.1 – 07/11/2018	EUROCONTROL	Published

SDM Deployment Assessment	
Target Date	31/12/2023

Initial AOP/NOP integration is in progress with delay due to the COVID crises, which lead to almost closure of some airports during 2020.

18 airports are required to implement this Family. As part of an Implementation Project, a planning is in place to avoid accumulation of airports wanting to implement close to the target date as the testing process typically requires several months.

Documentation sufficient to deploy in a harmonised way.

Family 4.3.1 – Automated Support for Traffic Complexity Assessment and Flight Planning Interfaces

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#19 "Automated support for Traffic Complexity Detection and Resolution"	CM-0103-A CM-0104-A	V3 – SESAR Release 5 (2016)
PJ.18-02C "eFPL Distribution to ATC"	POI-0049-IS	V3 – SESAR Release 9 (2020)
VLDs		**Date**
PJ.24 NCM "Network Collaborative Management"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2019/123 of 24 January 2019 laying down detailed rules for the implementation of air traffic management (ATM) network functions and repealing Commission Regulation (EU) No 677/2011	European Commission	Published
Commission Regulation (EU) No 255/2010 of 25 March 2010 laying down common rules on air traffic flow management	European Commission	Published
Commission Regulation (EU) No 1033/2006 - Requirements on procedures for flight plans in the pre-flight phase for the single European sky	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
SPEC-0101 Specification for the Initial Flight Plan (IFPL), Edition 1.3, Community Specification	EUROCONTROL	Published
SPEC-0101 Specification for the Initial Flight Plan (IFPL), Edition 2.0	EUROCONTROL	Published (waiting to be listed in OJEU)
SPEC-0101 Specification for the Initial Flight Plan (IFPL), Edition 3.0	EUROCONTROL	Q2/2023

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ATFCM Operations Manual	EUROCONTROL/NM	Published
IFPS USERS MANUAL	EUROCONTROL/NM	Published (Continuously maintained)
Flight Plan and Flight Data Evolution Implementation Strategy	EUROCONTROL/NM	Published
FPFDE Implementation Guidelines (Volumes 1 and 2)	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ICAO Doc 4444 PANS-ATM Procedures for Air Navigation Services: Air Traffic Management	ICAO	Published
Doc 9965 Manual on Flight and Flow Information for a Collaborative Environment (FF-ICE)	ICAO	Published
Network Strategy Plan (NSP): SO 4/2, SO 4/3, SO 4/4, SO 4/5 and SO 4/7	EUROCONTROL/NM	Published
NM Flight Progress Messages Document; Edition 2.6 (July 2020)	EUROCONTROL/NM	Published

SDM Deployment Assessment	
Target Date	31/12/2022

FF-ICE initial implementation and trajectory update are in progress. FF-ICE is an essential enabler for Trajectory Based Operations. Documentation on trajectory (flight planning and updates) is sufficient for a harmonized implementation. Basic requirements on complexity are available. The roll out of eFPL Functionality follows different timeline in each of the airlines. Information is exchanged using SWIM and the resolution of some technical B2B issues is in progress.

Family 4.4.1 – AOP/NOP Integration

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#21 "Airport operations plan and AOP-NOP seamless integration"	AO-0801–A AO-0802–A AO-0803 DCB-0310	V3 – SESAR Release 5 (2016)
#20 "Collaborative NOP for Step 1"	DCB-0103-A	V3 – SESAR Release 5 (2016)
#18 "CTOT and TTA"	DCB-0208	V3 – SESAR Release 5 (2016)
VLDs		**Date**
PJ.24 NCM "Network Collaborative Management"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
Commission Implementing Regulation (EU) 2019/123 of 24 January 2019 laying down detailed rules for the implementation of air traffic management (ATM) network functions and repealing Commission Regulation (EU) No 677/2011	European Commission	Published
Commission Regulation (EU) No 255/2010 of 25 March 2010 laying down common rules on air traffic flow management	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
DPI Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published
API Implementation Guide Edition 2.5/15-05-2022	EUROCONTROL	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
DPI & FUM Implementation Roadmap Edition 2.2/15-05-2022	EUROCONTROL/NM	Published
Departure Planning Information (DPI) & Arrival Planning Information (API) implementation roadmap Edition 2.3/15-05-2022	EUROCONTROL/NM	Published
Guidance on Compliance to the CP1 (IR 2021/116) - For the Initial AOP and information sharing of the initial AOP with the Network Operations Plan	ACI EUROPE	Published
Guidance to the CP1 (IR 2021/116) - For the Extended AOP and integration of the E-AOP with the Network Operations Plan	ACI EUROPE	Q1/2023
iAOP-NOP Implementation Guide	EUROCONTROL/ACI Europe	Published
E-AOP-NOP Implementation Guide	ACI Europe/EUROCONTROL	Q3/2023
NM B2B Reference Manuals	EUROCONTROL/NM	Published
NM B2B Services webpage	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 9971 Manual on Collaborative Air Traffic Flow Management (ATFM part)	ICAO	Published
AOP practical guide	ACI Europe	Q2/2023
Airport Network Integration - concept for establishment of an Airport Operations Plan (AOP) Ed1.1 – 07/11/2018	EUROCONTROL	Published
Network Strategy Plan (NSP): SO 4/4, SO 4/5 and SO 5/2	EUROCONTROL/NM	Published
EUROCONTROL A-CDM webpage	EUROCONTROL	Published

SDM Deployment Assessment	
Target Date	31/12/2027

The Data elements that should be exchanged in this Family are currently still being agreed among the stakeholders.

The requirements and contextual processes will still evolve in the coming years. 28 airports are required to implement this Family. A planning should be established to avoid accumulation of airports wanting to implement close to the target date.

4.6 ATM Functionality 5 – SYSTEM WIDE INFORMATION MANAGEMENT (SWIM)

Family 5.1.1 – Common SWIM PKI and cybersecurity

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#46 "Initial system-wide information management (SWIM) technology solution"	IS-0901-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SWIM Common PKI policies & Procedures	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
Trust Framework	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
EACP Criteria and Methodology for Interoperability	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
Common PKI policies and processes	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
SWIM interfaces to Common PKI	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Guidance for SWIM Providers and consumers	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
Certificate policy	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

SDM Deployment Assessment	
Target Date	31/12/2025

SDM will facilitate the next phases to deploy the EACP including organising the call for tenders (CfTs). The first CfTs are expected to be launched in 2023 and, after contract negotiation and signature, deployed into operation well before the deployment target date by end 2024. The guidance material produced by the IP will be handed over to the early adopters and administratively managed by EUROCONTROL. With this deployment, the EACP will comply with CP1. Next phases of the EACP, already approved by the IP and consulted by the mandated stakeholders through the use of the SDM consultation process, will be deployed when needed. This phase will also be facilitated and monitored by SDM.

Family 5.2.1 – Stakeholders SWIM PKI and cybersecurity

EOC: ATM interconnected network, Airport and TMA performance

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#46 "Initial system-wide information management (SWIM) technology solution"	IS-0901-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SWIM Common PKI policies & Procedures	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
Trust Framework	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
SWIM interfaces to Common PKI	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu
Guidance for SWIM Providers and Consumers	IP 2017_084_AF5	Published www.sesardeploymentmanager.eu

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

SDM Deployment Assessment	
Target Date	31/12/2025

Local deployment has been ongoing for some time and with the released guidance material from the EACP IP (AF 5.1.1) the dependencies with Common PKI are visible for all stakeholders. For stakeholders not having chosen an implementation option, as described in the SDP, this task is eminent as there are huge differences in both work effort and budget.

Due to the community engagement in the European common PKI project, the awareness of what is required is good and hence this Family should be implemented together with the implementation of the service Families.

This Family is an enabler for other service Families (AF 5.3.1, AF 5.4.1, AF 5.5.1 and AF 5.6.1) as the use of a trusted certification authority is part of the European aviation trust framework and a requirement for conformance with SWIM TI Yellow Profile.

Coming evolutions of the EACP that may require local adaptation, e.g. signing and validation as a service, are well described in the guidance material (see above). SDM will continue to monitor the progress until full implementation by all stakeholders.

Family 5.3.1 – Aeronautical Information Exchange

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#34 "Digital integrated briefing" Digital integrated briefing"	IS-0205	V3 – SESAR Release 5 (2016)
#46 "Initial system-wide information management (SWIM) technology solution"	IS-0901-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
EU Reg 373/2017 Part AIS	EASA	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Supporting material for SWIM foundational specifications (online) reference.swim.aero	EUROCONTROL/NM	Published
AIRM model v1.1.0 (AIRM Community area)	AIRM CCB	Published
SPEC-168 SWIM Service Description Edition 2.0	EUROCONTROL/NM	Published
SPEC-169 SWIM Information Definition Edition 1.0	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-170 SWIM Technical Infrastructure Yellow Profile Edition 1.1	EUROCONTROL/NM	Published
Supporting AIM SWIM Service implementation		
Digital Notam Specification Edition 1.0	EUROCONTROL/NM	Published
Update of Digital Notam Specification Edition 1.0	EUROCONTROL/NM	Q2/2023
Aeronautical Information Exchange Model AIXM Edition 5.1.1	EUROCONTROL/NM	Published
Aeronautical Information Exchange Model AIXM Edition Edition 5.2	EUROCONTROL/NM	Q1/2023
Aeronautical Information Request Service Definition	EUROCONTROL/NM	Q1/2023
Aeronautical Aerodrome Maps Service Definition	EUROCONTROL/NM	Q1/2023
Aeronautical Events Service Definition	EUROCONTROL/NM	Q1/2023
Supporting ASM SWIM Service implementation		

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-179 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level - Part II Edition 1.0	EUROCONTROL/NM	Published
SPEC-179 Specification for Airspace Management (ASM) Support System Requirements supporting the ASM processes at local and FAB level - Part II Edition 1.1	EUROCONTROL/NM	Q1/2023
NM B2B Reference Manuals (incl. Interfaces needed)	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
ICAO Annex 15	ICAO	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

SDM Deployment Assessment	
Target Date	31/12/2025

Deployment is very limited despite the availability of key reference material. There are, however, planned deployment activities involving a significant number of stakeholders that could bring firm progress over the next couple of years. The availability of airspace structure and availability services are the most notable achievements. Airspace Reservation services (ARES) together with Digital NOTAM, Aeronautical information feature (AIFS) and Aerodrome mapping services are expected to progress firmly over the next couple of years based on the availability of enhanced reference material and the wide collaboration among stakeholders to ensure harmonized and coordinated implementation.

Family 5.4.1 – Meteorological Information Exchange

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#34 "Digital integrated briefing" "Digital integrated briefing"	IS-0205	V3 – SESAR Release 5 (2016)
#35 "MET Information Exchange"	MET-0101	V3 – SESAR Release 5 (2016)
#46 "Initial system-wide information management (SWIM) technology solution"	IS-0901-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
TOPMET (LD) - Demonstrating the exchange and use of new meteorological Information		2012-2014

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
EU Reg 373/2017 Part MET	EASA	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
AMC & GM to Part-MET (EU Reg 373/2017)	EASA	Published
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
WMO No. 306 (updated 2019) Manual on Codes	WMO	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ICAO EUR Doc 033 - Guidelines for the Implementation of OPMET Data Exchange using IWXXM in the EUR Region	ICAO	Published
ICAO MET SWIM Roadmap	ICAO	Published
ICAO MET SWIM Plan	ICAO	Published
Supporting material for SWIM foundational specifications (online) reference.swim.aero	EUROCONTROL/NM	Published
AIRM model v1.1.0 (AIRM Community area)	AIRM CCB	Published
SPEC-168 SWIM Service Description Edition 2.0	EUROCONTROL/NM	Published
SPEC-169 SWIM Information Definition Edition 1.0	EUROCONTROL/NM	Published
SPEC-170 SWIM Technical Infrastructure Yellow Profile Edition 1.1	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
ICAO Annex 3 (amendment 80)	ICAO	Published
Updated ICAO Annex 3 (amendment 81)	ICAO	Q4/2023
ICAO PANS MET	ICAO	Q4/2023
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

SDM Deployment Assessment	
Target Date	31/12/2025

Deployment by MET Service Providers across Europe has been ongoing for some time and it is visible with the 24 MET SWIM services already in the SWIM registry. There is however a slowdown in implementation, mostly motived by the lack of adoption of implemented MET SWIM services. It is critical that stakeholders jointly define requirements for the implementation of specific MET SWIM services.

Family 5.5.1 – Cooperative Network Information Exchange

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#46 "Initial system-wide information management (SWIM) technology solution"	IS-0901-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
PJ.24 NCM "Network Collaborative Management"		SESAR Release 9 (2020)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
NM B2B technical documentations (incl. interfaces)	EUROCONTROL/NM	Published
Supporting material for SWIM foundational specifications (online) reference.swim.aero	EUROCONTROL/NM	Published
AIRM model v1.1.0 (AIRM Community area)	AIRM CCB	Published
SPEC-168 SWIM Service Description Edition 2.0	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-169 SWIM Information Definition Edition 1.0	EUROCONTROL/NM	Published
SPEC-170 SWIM Technical Infrastructure Yellow Profile Edition 1.1	EUROCONTROL/NM	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
NM B2B Services webpage	EUROCONTROL/NM	Published
NM B2B Reference Manuals	EUROCONTROL/NM	Published

SDM Deployment Assessment	
Target Date	31/12/2025
All services in this Family have been implemented by NM and are in the SWIM Registry. However, the usage of the services is low, due to the availability of other exchange mechanisms.	

Family 5.6.1 – Flight Information Exchange

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#46 "Initial system-wide information management (SWIM) technology solution"	IS-0901-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Supporting material for SWIM foundational specifications (online) reference.swim.aero	EUROCONTROL/NM	Published
AIRM model v1.1.0 (AIRM Community area)	AIRM CCB	Published
SPEC-168 SWIM Service Description Edition 2.0	EUROCONTROL/NM	Published
SPEC-169 SWIM Information Definition Edition 1.0	EUROCONTROL/NM	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-170 SWIM Technical Infrastructure Yellow Profile Edition 1.1	EUROCONTROL/NM	Published
Related to FF-ICE R1 implementation		
FIXM user Manual 4.2.0	FIXM CCB	Published
FIXM v4.0	FIXM CCB	Published
NM B2B technical documentation (incl. interfaces)	EUROCONTROL/NM	Published
FIXM "FF-ICE Message" Application v1.1.0 based on FIXM Core 4.3.0	FIXM CCB	Published
Related to Extended AMAN SWIM service implementation		
ED-254 MASPS covering the Extended horizon AMAN upstream coordination service	EUROCAE	Published

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ICAO Doc 4444 PANS-ATM Procedures for Air Navigation Services: Air Traffic Management	ICAO	Published
Doc 9965 Manual on Flight and Flow Information for a Collaborative Environment (FF-ICE)	ICAO	Published
NM B2B Services webpage	EUROCONTROL/NM	Published
NM B2B Reference Manuals	EUROCONTROL/NM	Published

SDM Deployment Assessment	
Target Date	31/12/2025

NM provides FF-ICE R1 services which can be found in the SWIM registry. The transition to FF ICE R1- becoming the consumer of the services is a critical enabler for achieving the level of collaboration envisaged in CP1 and beyond therefore the transition from FPL to eFPL must be carefully planned and timed with the next steps including the decommissioning of legacy exchange mechanisms. Furthermore, AUs need to start filling eFPLs as well as ANSPs need to update FDPs to process eFPLs to materialise all the operational benefits.

4.7 ATM Functionality 6 – Initial Trajectory Information Sharing

Family 6.1.1 – Initial air-ground Trajectory Information Sharing (Airborne Domain)

EOC: Trajectory-based operations

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#115 Extended projected profile (EPP) availability on ground	IS-0303-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
PJ.31 "Initial Trajectory Information Sharing"		SESAR Release 9 (2020)
PJ.38 ADSCENSIO "ADS-C Enables and Supports Improved ATM Operations"		SESAR Release 12 (2022)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
EASA rule making process 2022-09	EASA	Q3-Q4/2023
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance (CS-ACNS) Issue x.xx (an updated issue including ADS-C/EPP is required)	EASA	Pending/TBD
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED 228A / RTCA DO-350A Safety and Performance Requirements Standard for Baseline 2 ATS Data Communications	EUROCAE / RTCA	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED 229A / RTCA DO-351A Interoperability Requirements Standard for Baseline 2 ATS Data Communications (Baseline 2 Interop Standard)	EUROCAE / RTCA	Published
ED 230A / RTCA DO-352A Interoperability Requirements Standard for Baseline 2 ATS Data Communications and FANS 1/A Accommodation (FANS 1/A – Baseline 2 Interop Standard)	EUROCAE / RTCA	Published
ED 231A / RTCA DO-353A Interoperability Requirements Standard for Baseline 2 ATS Data Communications and ATN Baseline 1 Accommodation (ATN Baseline 1 - Baseline 2 Interop Standard)	EUROCAE / RTCA	Published
ED-228B Safety and Performance Standard for Baseline 2 ATS Data Communication	EUROCAE WG-78	Q2/2023
ED-229B Interoperability Standard for Baseline 2 ATS Data Communication Via ATN	EUROCAE WG-78	Q2/2023
ED-230B Interoperability Standard for Baseline 2 ATS Data Communication, FANS 1/A Accommodation	EUROCAE WG-78	Q2/2023
ED-231B Interoperability Standard for Baseline 2 ATS Data Communication, Baseline 1 Accommodation	EUROCAE WG-78	Q2/2023

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
Commission Regulation (EC) No 29/2009 of 16 January 2009 laying down requirements on data link services for the single European sky **This is already in force in SES**	European Commission	Published
Commission Implementing Regulation (EU) No 2020/208. Amendment of Commission Regulation (EC) No 29/2009 of 16 January 2009 laying down requirements on data link services for the single European sky: Update of references — Data Link Services **This is already in force in SES**	European Commission	Published
Commission Implementing Regulation (EU) 2015/310 of 26 February 2015 amending Regulation (EC) No 29/2009 laying down requirements on data link services for the single European sky and repealing Implementing Regulation (EU) No 441/2014 **This is already in force in SES**	European Commission	Published

Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 10037 - Global Operational Data Link (GOLD) Manual	ICAO	Published
EN 301 841-1 (V 1.5.1) VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 1: Physical layer and MAC sub-layer **This is required by IR 29/2009**	ETSI	2023
EN 301 841-2 (V 1.2.1) VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 2: Upper Layers **This is required by IR 29/2009**	ETSI	Published

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
EN 301 841-3 (V2.1.1) VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 3: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU **This is required by IR 29/2009**	ETSI	Published
EN 301 841-3 (V2.2.1) VHF air-ground Digital Link (VDL) Mode 2, Part 3: Harmonized standard for access to radio spectrum	ETSI	2023
ED-110B / RTCA DO-280B Interoperability Requirements Standard for ATN Baseline 1 (Interop ATN B1)	EUROCAE	Published
ED-120 Change 3 - Safety and Performance Requirements Standard for Air Traffic Data Link Services in Continental Airspace	EUROCAE	Published
ED-92C VDL 2 Airborne MOPS (Minimum Operational Performance Standard (MOPS) for an Airborne VDL Mode-2 System Operating in the Frequency Range 118-136.975 MHz)	EUROCAE	Published
ED-92D VDL 2 Airborne MOPS	EUROCAE WG-92	Q4/2023

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED-276 - Guidance on Air to Ground VDL Mode 2 Interoperability	EUROCAE	Published
ED-276A Guidance on Air to Ground VDL Mode 2 Interoperability	EUROCAE WG-92	Q4/2024

SDM Deployment Assessment	
Target Date	31/12/2027

All Families in AF6 are subject to an industrialisation target date at the end of 2023 as described in the CP1 Regulation.

ADS-C/EPP deployment roadmap on Airbus side (A320/A330/A350) is established based on ATN/OSI communication protocols, except for the A220 Family. However, for all other manufacturers and especially Boeing, development/industrialisation and deployment roadmaps are not yet defined.
The FAA Datacom roadmap requests implementing ATS B2 standards over IPS protocol only. US manufacturers are in favour of the FAA planning and intend to implement ADS-C/EPP over ATN/IPS.

FANS-1/A+, providing ADS-C Position Reporting, is already in service.

A Certification Specifications and Acceptable Means of Compliance for Airborne Communications, Navigation and Surveillance (CS-ACNS) including ADS-C/EPP is required (today aircraft equipped with ADS-C/EPP are permitted by individual agreements).

Family 6.1.2 – Initial Air-Ground Trajectory Information Sharing (ground domain)

EOC: Trajectory-based operations

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#115 "Extended projected profile (EPP) availability on ground"	IS-0303-A	V3 – SESAR Release 5 (2016)
#18-06b1 "NM trajectory Performance Improvement"	POI-0011-IS	Not achieved
VLDs		**Date**
PEGASE		SESAR Release 5 (2016)
PJ.31 "Initial Trajectory Information Sharing"		SESAR Release 9 (2020)
PJ.38 ADSCENSIO "ADS-C Enables and Supports Improved ATM Operations"		SESAR Release 12 (2022)

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
SPEC-0106 On-Line Data Interchange (OLDI) Update of Edition 5.0, Community Specification CS 2019/C 31/06 (an updated issue including ADS-C/EPP as part of B2 compatibility is required)	EUROCONTROL	Published (waiting to be listed in OJEU)
SPEC-0106 On-Line Data Interchange (OLDI) Edition 5.1	EUROCONTROL	Q1/2023

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED 228A / RTCA DO-350A Safety and Performance Requirements Standard for Baseline 2 ATS Data Communications	EUROCAE / RTCA	Published
ED 229A / RTCA DO-351A Interoperability Requirements Standard for Baseline 2 ATS Data Communications (Baseline 2 Interop Standard)	EUROCAE / RTCA	Published
ED 230A / RTCA DO-352A Interoperability Requirements Standard for Baseline 2 ATS Data Communications and FANS 1/A Accommodation (FANS 1/A – Baseline 2 Interop Standard)	EUROCAE / RTCA	Published
ED 231A / RTCA DO-353A Interoperability Requirements Standard for Baseline 2 ATS Data Communications and ATN Baseline 1 Accommodation (ATN Baseline 1 - Baseline 2 Interop Standard)	EUROCAE / RTCA	Published
ED-228B Safety and Performance Standard for Baseline 2 ATS Data Communication	EUROCAE WG-78	Q2/2023
ED-229B Interoperability Standard for Baseline 2 ATS Data Communication Via ATN	EUROCAE WG-78	Q2/2023
ED-230B Interoperability Standard for Baseline 2 ATS Data Communication, FANS 1/A Accommodation	EUROCAE WG-78	Q2/2023

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
ED-231B Interoperability Standard for Baseline 2 ATS Data Communication, Baseline 1 Accommodation	EUROCAE WG-78	Q2/2023

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
Commission Regulation (EC) No 29/2009 of 16 January 2009 laying down requirements on data link services for the single European sky **This is already in force in SES**	European Commission	Published
Commission Implementing Regulation (EU) No 2020/208. Amendment of Commission Regulation (EC) No 29/2009 of 16 January 2009 laying down requirements on data link services for the single European sky: Update of references — Data Link Services **This is already in force in SES**	European Commission	Published
Commission Implementing Regulation (EU) 2015/310 of 26 February 2015 amending Regulation (EC) No 29/2009 laying down requirements on data link services for the single European sky and repealing Implementing Regulation (EU) No 441/2014 **This is already in force in SES**	European Commission	Published

Regulation		
References	**Organization**	**Delivery**
Commission Regulation (EC) No 30/2009 of 16 January 2009 amending Regulation (EC) No 1032/2006 as far as the requirements for automatic systems for the exchange of flight data supporting data link services are concerned **This is already in force in SES**	European Commission	Published
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Doc 10037 - Global Operational Data Link (GOLD) Manual	ICAO	Published
EN 301 841-1 (V 1.5.1) VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 1: Physical layer and MAC sub-layer **This is required by IR 29/2009**	ETSI	2023

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
EN 301 841-2 (V 1.2.1) VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 2: Upper Layers **This is required by IR 29/2009**	ETSI	Published
EN 301 841-3 (V2.1.1) VHF air-ground Digital Link (VDL) Mode 2; Technical characteristics and methods of measurement for ground-based equipment; Part 3: Harmonised Standard covering the essential requirements of article 3.2 of the Directive 2014/53/EU **This is required by IR 29/2009**	ETSI	Published
EN 301 841-3 (V2.2.1) VHF air-ground Digital Link (VDL) Mode 2, Part 3: Harmonized standard for access to radio spectrum	ETSI	2023
ED-110B / RTCA DO-280B Interoperability Requirements Standard for ATN Baseline 1 (Interop ATN B1)	EUROCAE	Published
ED-120 Change 3 - Safety and Performance Requirements Standard for Air Traffic Data Link Services in Continental Airspace	EUROCAE	Published
ED-276 - Guidance on Air to Ground VDL Mode 2 Interoperability	EUROCAE	Published
ED-276A Guidance on Air to Ground VDL Mode 2 Interoperability	EUROCAE WG-92	Q4/2024

Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Specification for SWIM ADS-C Ground Distribution Service EUROCONTROL-SPEC-nnn Edition 1.0	EUROCONTROL	Q4/2023
Specification for ADS-C Common Service EUROCONTROL-SPEC-nnn Edition 1.0	EUROCONTROL	Q4/2023

SDM Deployment Assessment	
Target Date	31/12/2027

All Families in AF6 are subject to an industrialisation target date at the end of 2023 as described in the CP1 Regulation.

F6.1.2 functionalities are already deployed and in operational use in the Maastricht Upper Airspace Control Center (MUAC). Therefore, those functionalities 158ave demonstrated TRL9, which is above the industrialisation level. Other ANSPs are involved in the SESAR2020 validation exercise (PJ38) and considering how to address the implementation in line with the outputs of the OEP12.2 work (see also F6.3.1).

[1] Maastricht UAC already uses the operational downlinking and processing of ADS-C/EPP data.

Family 6.2.1 – Network Manager Trajectory Information Enhancement

EOC: Trajectory-based operations

V3 – Development Phase		
SESAR Solutions	**Ois**	**V3 Achievement Date**
#18-06b1 "NM trajectory Performance Improvement"	POI-0011-IS	Not achieved
VLDs		**Date**
None		N/A

V4 – Industrialization Phase. Essential material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

SDM Deployment Assessment	
Target Date	31/12/2027

All Families in AF6 are subject to an industrialisation target date at the end of 2023 as described in the CP1 Regulation.

The non-availability of a confirmed planning and validation activities from most of the manufacturing industries are seen as a risk to achieve the implementation of this Family in time.

Family 6.3.1 – Initial Trajectory Information Sharing Ground Distribution

EOC: ATM interconnected network

V3 – Development Phase		
SESAR Solutions	**OIs**	**V3 Achievement Date**
#115 "Extended projected profile (EPP) availability on ground"	IS-0303-A	V3 – SESAR Release 5 (2016)
VLDs		**Date**
PJ.31 "Initial Trajectory Information Sharing"		SESAR Release 9 (2020)
PJ.38 ADSCENSIO "ADS-C Enables and Supports Improved ATM Operations"		SESAR Release 12 (2022)

V4 – Industrialization Phase. Essential material[5].		
Regulation		
References	**Organization**	**Delivery**
EASA rule making process 2022-09	EASA	Q3-Q4/2023
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
None	N/A	N/A

[5] Essential Material will be identified once the industrialization target is passed

V4 – Industrialization Phase. Supporting material.		
Regulation		
References	**Organization**	**Delivery**
None	N/A	N/A
Means of Compliance and/or Certification		
References	**Organization**	**Delivery**
None	N/A	N/A
Guidance Material / Specifications / Standards		
References	**Organization**	**Delivery**
Specification for SWIM ADS-C Ground Distribution Service EUROCONTROL-SPEC-nnn Edition 1.0	EUROCONTROL	Q4/2023
Specification for ADS-C Common Service EUROCONTROL-SPEC-nnn Edition 1.0	EUROCONTROL	Q4/2023

SDM Deployment Assessment	
Target Date	31/12/2027

All Families in AF6 are subject to an industrialisation target date at the end of 2023 as described in the CP1 Regulation.

In Family 6.3.1, the implementation of data ground distribution is highly dependent on the outcomes of SJU PJ38. Although this is not mandated in CP1, PJ38 is demonstrating that deployment of AF6.3.1 Family in Europe will greatly benefit from the implementation of a ADS-C common service (also a clear benefit for F6.1.2). Several specification and guidance documents are currently under development in a joint SDM/EUROCONTROL effort (Operational Excellence Programme Work Stream 12.2). They are expected to be available as a mature draft mid-2023 and in a final version before the end of 2023:

- Specifications of the common Logon and ADS-C service
- Specifications of the ground SWIM EPP distribution
- Template for SLA between Airlines and ground ADS-C data users
- Guidance material for stakeholders.

5. Acronyms

Acronym	Description
#	
4D	*Four Dimensional: x, y, z and time*
A	
A3SG	AIM SWIM Services Subgroup
A6	*A6 Alliance*
ACC	*Area Control Centre*
A-CDM	*Airport Collaborate Decision Making*
ACH	*ATC Change Message (ICAO format, NMOC special)*
ACS	ADS-C Common Service
ADEXP	*ATS Data Exchange Presentation*
ADR	Airspace Data Repository
ADS	*Automatic Dependent Surveillance*
ADS-C	*Automatic Dependent Surveillance Contract*
ADS-C EPP	*Automatic Dependent Surveillance Contract Extended Project Profile*
AF	*ATM Functionality*
AFI	*Arrival Free Intervals*
AFP	*ATC Flight Plan proposal Message (ICAO)*
AFTN	*Aeronautical Fixed Telecommunications Network*
AFUA	*Advanced Flexible Use of Airspace*
AIM	*Aeronautical Information Manual*
AIP	*Aeronautical Information Publication*
AIRAC	*Aeronautical Information Regulation and Control*
AIRM	*Aeronautical Information Reference Model*
AIS	*Aeronautical Information Service*
AISP	*Aeronautical Information Service Provider*
AIXM	*Aeronautical Information Exchange Model*
AMA	*Arrival Manager Constraint message (OLDI)*
AMAN	*Arrival Manager*
AMC	*Airspace Management Cell*
AMC	Acceptable Means of Compliance
AMHS	ATS Message Handling System
AMXM	*Aerodrome Mapping Exchange Model*
ANSP	*Air Navigation Service Provider*
AO	*Airline Operator /Airport Operator*
AOC	*Airline Operating Centre /Airline Operating Communication*
AOM	*Aircraft Operations Manual*
AOP	*Airport Operations Plan*
API	*Application Interface /Arrival Planning Information*
APL	*ATC Flight Plan Message (ICAO)*
APOC	*Airport Operations Centre*
APP	*Approach Control Unit /Approach Control Position*
APW	*Area Proximity Warning*
A-RDP	*ATM Rolling Development Plan*
ARES	*Airspace Reservation*
ARO	Aeronautical Reporting Office
ARR	*ICAO ATS Arrival Message*
ASM	*Airspace Management*
A-SMGCS	*Advanced Surface Movement Guidance and Control System*
ATC	*Air Traffic Control*

Acronym	Description
ATCO	*Air Traffic Controller*
ATFCM	*Air Traffic Flow and Capacity Management*
ATFM	*Air Traffic Flow Management*
ATFMU	*Air Traffic Flow Management Unit*
ATN	*Aeronautical Telecommunications Network*
ATOT	*Actual Take Off Time*
ATS	Air Traffic Service
ATSU	Air Traffic Service Unit
AU	Airspace User
AUP	Airspace Use Plan
AVSEC	Aviation Security
B	
B1	*Baseline 1*
B2	*Baseline 2*
B2B	*Business to Business*
BFD	*Basic Flight Data (DFS version of an IFPL)*
C	
CA	*Conflict Alert /Contractual Management*
CACD	*Central Airspace and Capacity Database*
CATC	*Conflicting ATC Clearances*
CBA	*Cross Border Area*
CDM	*Collaborative Decision Making*
CDO	*Continuous Descent Operations*
CEF	Connecting Europe Facility
CFD	Change to Flight Data
CFPS	Computer Flight Plan Software Provider
CFSP	Computer Flight Planning Service Providers
CFT	Call for Tender
CHMI	Collaborative Human Machine Interface
CIAM	Collaborative Interface for Airspace Management
CMAC	Civil-Military ATM Coordination
CNS	Communications, Navigation and Surveillance
CONOPS	Concept of Operations
COP	Coordination Point
CORA	Conflict Resolution Advisory
COTS	Commercial Off-The-Shelf
COVID	Corona Virus Disease
CP1	Common Project 1
CPDLC	Controller Pilot Data Link Communications
CSP	Communication Service Provider
CTOT	Calculated Take Off Time
CWP	Controller Working Position
D	
DCT	Direct Routing
DEP	ICAO ATS Departure Message
DLS	Data Link Service
DM	Deployment Milestone
DMAN	Departure Manager
DPI	Departure Planning Information
DSP	Data Link Service Provider
E	
EACP	*European Aviation Common PKI*

Acronym	Description
EAD	*European AIS Database*
EAOP	Extended Airport Operations Plan
EAP	EU ATC Harmonisation and Integration Programme Alignment Process
EASA	European Aviation Safety Agency
EATMN	European Air Traffic Management Network
EAUP	European Airspace Use Plan
EC	European Commission
ECI	Electronic Clearance Input
ED	EUROCAE Document
EDA	European Defense Agency
EFD	EFTMS Flight Data
EFPS	Electronic Flight Progress Strip
EFS	Electronic Flight Strip
EIBT	Estimated In-Block Time
EN	European Norm
EOC	Essential Operational Changes
EPP	Extended Projected Profile
ERNIP	European Route Network Improvement Plan
ESA	European Space Agency
ESCP	European Strategic Coordination Platform
ESSP	European Satellite Service Provider
ETFMS	Enhanced Tactical Flow Management System
ETOT	Estimated Take-Off Time
ETSI	European telecommunication Standardisation Institute
EU	European Union
EUR	European Region
EUROCONTROL	European Organisation for the Safety of Air Navigation
EUUP	European Update Airspace Use Plan
F	
FAA	*Federal Aviation Administration*
FAB	*Functional Airspace Block*
FDP	*Flight Data Processing*
FDPS	*Flight Data Processing System*
FF-ICE	*Flight and Flow Information for a Collaborative Environment*
FIXM	*Flight Information Exchange Model*
FL	*Flight Level*
FMP	*Flow Management Position*
FMS	*Flight Management System*
FMTP	Flight Message Transfer Protocol
FOC	Flight Operations Contro
FPL	Flight Plan Message (ICAO)
FRA	Free Route Airspace or Fraport
FUA	Flexible use of Airspace
FUM	Flight Update Message
G	
GA	General Aviation
GANP	*Global Air Navigation Plan (ICAO)*
GAT	*General Aviation Traffic*
GIS	*Geographical Information System*
GML	*Geography Mark-up Language*
GUFI	*Global Unique Flight Identifier*
H	

Acronym	Description
HMI	Human Machine Interface
HVAC	*Heating, Ventilating and Air Conditioning*
I	
iAOP	*Initial Airport Operations Plan*
IATA	*International Air Transport Association*
IATF	*International Aviation Trust Framework*
ICAO	*International Civil Aviation Organisation*
ICD	*Interface Control Document*
ICS	*Industrial Control System*
IFPS	*Integrated Initial Flight Plan Processing System*
INAP	*Integrated Network Management and Extended ATC Planning*
IP	*Internet Protocol*
IR	Implementing Rule /Integrated Receiver
IT	Information Technology
IWXXM	ICAO Meteorological Information Exchange Model
K	
KPA	*Key Performance Area*
KPI	*Key Performance Indicator*
L	
LARA	*Local and Regional ASM Application*
LDACS	*L-Band Digital Aeronautical Communication System*
LOA	*Letter of Agreement*
LVP	*Low Visibility Procedure*
M	
MASPS	*Minimum Aircraft System Performance Specification*
MCDM	*Measure Collaboration Decision Making*
MET	*Meteorological*
METAR	*Meteorological Aviation Routine Report*
MOC	*Memorandum of Cooperation*
MONA	*Monitoring Aids*
MOU	*Memorandum of Understanding*
MP	*Measurement Plan*
MSP	*Multi-sector Planner*
MTCD	*Medium Term Conflict Detection*
MWO	*Meteorological Watch Office*
N	
NES	n-CONNECT
NIA	*Network Impact Assessment*
NM	*Nautical Mile /Network Manager*
NMOC	*Network Manager Operation Centre*
NOP	*Network Operations Plan*
NOTAM	*Notice to Airmen*
NPV	Net Present Value
NPZ	*No Planning Zone*
NSA	*National Supervisory Authority*
O	
OAT	Operational Air Traffic
OEP	*Operational Excellence Programme*
OJEU	Official Journal of the EU
OLDI	*On-Line Data Interchange*
OPS	*Operational*
OSI	*Open Systems Interconnection*

Acronym	Description
OT	*Operational Technology*
OTMV	*Occupancy Traffic Monitoring Values*
P	
PCP	*Pilot Common Project*
PDPI	*Pre-Departure Information*
PDS	*Pre-Departure Sequencing System*
PENS	*Pan-European Network Service*
PIB	Pre-flight Information Bulletins
PJ	*SESAR JU Project*
PKI	*Public Key Infrastructure*
PSR	*Primary Surveillance Radar*
R	
RAD	*Route Availability Data*
RMCA	*Runway Monitoring and Conflict Alerting*
RPA	*Remotely Piloted Aircraft*
RRP	*Re-routing Proposal Message*
RWY	*Runway*
S	
SAM	*Slot Allocation Message (ETFMS)*
SARP	*Standard and Recommended Practice (ICAO)*
SCADA	*Supervisory Control and Data Acquisition*
SDM	*SESAR Deployment Manager*
SDP	*SESAR Deployment Programme*
SES	*Single European Sky*
SESAR	*Single European Sky ATM Research*
SHAPE	*Solutions for Human-Automation Partnerships in European ATM*
SIGMET	*Significant Meteorological Advisory*
SJU	*SESAR Joint Undertaking*
SMAN	Surface Management
SMS	Safety Management System
SPEC	*Specification*
SPECI	*Special Aerodrome Weather Report*
SRM	*Slot Revision Message (ETFMS)*
SSR	*Secondary Surveillance Radar*
STAM	*Short Term ATFM Measures*
SUP	*Supervisor/Supplement*
SWA	*Software Assurance*
SWIM	*System Wide Information Management*
SYSCO	*System Supported Coordination*
T	
TAC	*Tactical Air Navigation*
TAF	*Terminal Aerodrome Forecast*
TBO	*Trajectory Based Operations*
TCA	*Terminal Conflict Alert*
TCT	*Tactical Controller Tool*
TFSG	*Trust Framework Study Group*
TI	*Technical Infrastructure*
TLS	Target Levels of Safety
TMA	*Terminal Manoeuvring Area*
TOBT	*Target Off Block Time*
TOT	*Take Off Time*
TRA	*Temporary Reserved Airspace/Temporary Restricted Area*

Acronym	Description
TS	*Time Server*
TSA	*Temporary Segregated Area*
TSAT	*Target Start-Up Approval Time*
TSO	Technical Specification Orders
TT	*Technical Topic (Technical Topics Database)*
TTA	*Target Time of Arrival*
TTO	*Target Time Over*
TTOT	*Target Take Off Time*
TWY	*Taxiway*
U	
UAC	*Upper Area Control Centre*
UAS	Unmanned Aircraft System
UUP	*Updated Airspace Use Plan*
V	
VA	*Validation Authority*
VAA	*Volcanic Ash Advisory*
VAAC	*Volcanic Ash Advisory Centre*
VACP	*Volcanic Ash Contingency Plan*
VDL	*Very-High Frequency Digital Link*
VDL2	*VDL Mode 2*
VFR	Visual Flight Rules
VLD	Very Large-Scale Demonstrations
VME	*VDL Management Entity*
VPA	*Variable Profile Areas*
VTTs	*Variable Taxi Times*
W	
WAFC	*World Area Forecast Centre*
WOC	Wing Operations Centre
Y	
YP	*Yellow Profile*