

CP1		Active							ECAC+	
AOM21.3		Enhanced Free Route Airspace Operations								
REG	ASP	MIL	APO	USE	INT	IND	NM	MET	AIS	USP

## Subject matter and scope

This implementation objective addresses the following three elements:

- Final FRA implementation
- Cross-border FRA implementation
- FRA connectivity with TMAs.

1) The Final FRA implementation shall eliminate the structural limitations that are permissible for Enhanced FRA in terms of timing limitations (night FRA, weekend FRA, seasonal FRA) and lateral and vertical limitations. RAD restrictions should be applied to the minimum extent possible, where unlimited free route airspace operations would endanger airspace capacity (e.g. in high-density, complex airspaces).

2) Cross-border FRA operations provide further benefits of the FRA concept to Airspace Users. Cross-border FRA shall be implemented with at least one neighbouring State. However, it should be considered by the implementing ANSPs, that maximum benefits for airspace users in terms of time, fuel and CO2 emissions savings will be achieved when cross-border FRA is implemented among all neighbouring states from the lowest mutual flight level upwards. For the time being, there are several cross-border FRA implementations, in some cases addressing the airspace controlled by several ANSPs within FAB and between FABs.

3) FRA connectivity with TMAs must be ensured by one of the following options:

- lowering the FRA vertical limit until the TMAs upper vertical boundaries;
- linking appropriate arrival/departures points;
- defining FRA connecting routes;
- extending the existing standard arrival and departure routes;
- connecting with the underlying fixed ATS routes via set of waypoints reflecting the typical climbing/descending profiles

Final FRA implementation, Cross-border FRA with at least one neighbouring State and FRA connectivity with TMAs shall be provided and operated at least above flight level 305.

The system requirements for implementation of the 3 elements of this objective need to encompass the system upgrades listed for Enhanced FRA and additional system upgrades as follows:

NM systems:

- Environmental database adaptations for cross-border FRA operations and FRA connectivity with TMAs;
- Data exchange for cross border FRA and FRA connectivity with TMAs.

AU systems:

- Optimisation of free routing trajectories taking into account the ATM constraints, including possible differences of FRA lower limit implementations throughout the flight.

ANSPs may decide which system improvements are needed in addition to those required for Initial FRA. The choice of the appropriate tool/function remains a stakeholder decision based on operational environment and may include the tools listed for Enhanced FRA plus additional tool/functions, as for example:

- COP management for FRA supporting Cross Border COP handling;
- Tactical Controller Tool (TCT), managing the Cross-Border clearances;
- Multi-Sector Planner/Extended ATC Planner (MSP/EAP) function.

**NOTE FOR MILITARY AUTHORITIES:** It is the responsibility of each Military Authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the Military Authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to MIL Authorities.

## Applicability Area(s) & Timescale(s)

Applicability Area 1	All EU SES States
Applicability Area 2	Albania, Armenia, Bosnia and Herzegovina, Georgia, Moldova, Montenegro, Morocco, North Macedonia, Serbia, Ukraine, United Kingdom

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<b>Timescales:</b>	<b>From:</b>	<b>By:</b>	<b>Applicable to:</b>
Initial Operational Capability	01/01/2021		Applicability Area 1 + Applicability Area 2
Full Operational Capability / Target Date		31/12/2025	Applicability Area 1 + Applicability Area 2

### References

#### European ATM Master Plan

Ol step -	<a href="#">[AOM-0501]-Free Routing for Flights both in cruise and vertically evolving within low to medium complexity environments</a>								
	Enablers -	AAMS-06c AOM19.5	AAMS-09a AOM19.5	AAMS-11 AOM19.5	AAMS-16a	AOC-ATM-10	ER APP ATC 129 ATC12.1	ER APP ATC 75 AOM21.2	ER APP ATC 77 AOM19.4, AOM19.5
		ER ATC 91 ATC12.1	NIMS-21a FCM10	NIMS-29 AOM21.2	NIMS-42 AOM19.5	PRO-085	STD-033	STD-061	STD-062
		STD-063	STD-064	SWIM-APS- 01a	SWIM-APS- 02a	SWIM-APS- 03a	SWIM-APS- 04a		
Ol step -	<a href="#">[AOM-0505]-Free Routing for Flights both in cruise and vertically evolving within high and very high complexity environments in Upper En Route airspace</a>								
	Enablers -	ER APP ATC 129 ATC12.1	ER APP ATC 78	ER ATC 91 ATC12.1	NIMS-37 FCM06.1				

Legend:	WXYZ-001	Covered by SLoA(s) in this objective	WXYZ-002 zzz	Covered by SLoA(s) in another objective Objective covering the enabler	WXYZ-003	Not covered in the Implementation Plan
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#### Applicable legislation

- COMMISSION IMPLEMENTING REGULATION (EU) 2021/116 of 1 February 2021 on the establishment of the Common Project One supporting the implementation of the European Air Traffic Management Master Plan provided for in Regulation (EC) No 550/2004 of the European Parliament and of the Council, amending Commission Implementing Regulation (EU) No 409/2013 and repealing Commission Implementing Regulation (EU) No 716/2014
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#### Essential Operational Changes

Fully Dynamic and Optimised Airspace
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#### SESAR Solution

#33 - Free Route through Free Routing for Flights both in cruise and vertically evolving above a specified Flight Level, PJ.06-01 - Optimized traffic management to enable Free Routing in high and very high complexity cross border environments.
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#### ICAO GANP - ASBUs

FRT0-B2/3	Large Scale Cross Border Free Route Airspace (FRA)
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#### Deployment Programme

3.2.2	Enhanced Free Route Airspace Operations
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#### European Plan for Aviation Safety

- none -
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#### Operating Environments

En-Route Network
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### Stakeholder Lines of Action (SLoAs)

SLoA ref.	Title	From	By
AOM21.3-ASP01	Implement Enhanced FRA procedures and processes in support of the Network dimension	01/01/2021	31/12/2025
AOM21.3-ASP02	Implement Enhanced FRA system improvements	01/01/2021	31/12/2025

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<b>AOM21.3-ASP03</b>	Implement Enhanced FRA procedures and processes in support of the local dimension	01/01/2021	31/12/2025
<b>AOM21.3-ASP04</b>	Safety Assessment	01/01/2021	31/12/2025
<b>AOM21.3-ASP05</b>	Training	01/01/2021	31/12/2025
<b>AOM21.3-ASP06</b>	Operational use	01/01/2021	31/12/2025
<b>AOM21.3-USE01</b>	Implement Enhanced FRA system improvements	01/01/2021	31/12/2025
<b>AOM21.3-USE02</b>	Implement Enhanced FRA procedures and processes	01/01/2021	31/12/2025
<b>AOM21.3-USE03</b>	Training	01/01/2021	31/12/2025
<b>AOM21.3-USE04</b>	Operational use	01/01/2021	31/12/2025
<b>AOM21.3-NM01</b>	Implement Enhanced FRA system improvements	01/01/2021	31/12/2025
<b>AOM21.3-NM02</b>	Implement Enhanced FRA procedures and processes	01/01/2021	31/12/2025
<b>AOM21.3-NM03</b>	Safety Assessment	01/01/2021	31/12/2025
<b>AOM21.3-NM04</b>	Training	01/01/2021	31/12/2025
<b>AOM21.3-NM05</b>	Operational use	01/01/2021	31/12/2025

Description of finalised and deleted SLOAs is available on the eATM Portal @ [https://www.eatmportal.eu/working/depl/essip\\_objectives](https://www.eatmportal.eu/working/depl/essip_objectives)

### Expected Performance Benefits

<b>Safety:</b>	Safety maintained.
<b>Capacity:</b>	Increased airspace capacity.
<b>Operational Efficiency:</b>	Improved operational efficiency. Optimised flight trajectories.
<b>Cost Efficiency:</b>	-
<b>Environment:</b>	Reduced fuel burn and emissions.
<b>Security:</b>	-

### Detailed SLoA Descriptions

<b>AOM21.3-ASP01</b>	<b>Implement Enhanced FRA procedures and processes in support of the Network dimension</b>	<b>From:</b>	<b>By:</b>
		<b>Applicability Area 1:</b> 01/01/2021	<b>Applicability Area 1:</b> 31/12/2025
<b>Action by:</b>	<b>ANS Providers</b>		
<b>Description &amp; purpose:</b>	Conduct the following actions: <ul style="list-style-type: none"> <li>• Identify the Final FRA airspace volume (Lateral and Vertical);</li> <li>• Identify the cross-border FRA airspace volume (Lateral and Vertical);</li> <li>• Identify the airspace foreseen for cross-border FRA operations (Lateral and Vertical);</li> <li>• Adapt Airspace design and ensure cross-border FRA horizontal and vertical connectivity and vertical connectivity</li> <li>• Validate airspace design with NM;</li> <li>• Network overview connectivity consistency of FRA application</li> <li>• ATFCM FRA procedures;</li> <li>• Adapt RAD applicability;</li> <li>• Validate RAD with NM.</li> </ul>		
	<b>Note :</b> This SLoA needs to be synchronised between ANSPs and NM.		
<b>Supporting material(s):</b>	SDM - Standardisation and Regulation support to CP1 deployment 2021, Deliverable D1.1.1 07/2021 Url : <a href="https://www.sesardeploymentmanager.eu/publications/deployment-programme">https://www.sesardeploymentmanager.eu/publications/deployment-programme</a>		
<b>ATM Master Plan relationship:</b>	<a href="#">[PRO-148]-ASM Procedures for identifying and promulgating 'Free Route' areas</a> <a href="#">[PRO-220a]-ATC Procedures related to Detection and Resolution of Complexity, Density and Traffic Flow Problems</a>		
<b>Finalisation criteria:</b>	1 - The local FRA airspace supporting Final FRA, Cross-border and TMA connectivity has been identified in coordination with the Network Manager and neighbouring States and the RAD has been updated accordingly 2 - The local ATFCM procedures have been updated in cooperation with the network to take on board the Final FRA, Cross-border and TMA connectivity impact		
<b>AOM21.3-ASP02</b>	<b>Implement Enhanced FRA system improvements</b>	<b>From:</b>	<b>By:</b>
		<b>Applicability Area 1:</b> 01/01/2021	<b>Applicability Area 1:</b> 31/12/2025
<b>Action by:</b>	<b>ANS Providers</b>		

AOM21.3		Enhanced Free Route Airspace Operations	
Description & purpose:		If needed, upgrade ATC systems and/or deploy the ATC functions deemed appropriate to support Initial FRA plus additional functions might be considered for cross-border FRA and FRA connectivity with TMA as: <ul style="list-style-type: none"><li>• COP management for FRA supporting Cross Border COP handling;</li><li>• Tactical Controller Tool (TCT), managing the Cross-Border clearances;</li><li>• Multi-Sector Planner/Extended ATC Planner (MSP/EAP) function.</li></ul>	
Supporting material(s):		SDM - Standardisation and Regulation support to CP1 deployment 2021, Deliverable D1.1.1 07/2021 Url : <a href="https://www.sesardeploymentmanager.eu/publications/deployment-programme">https://www.sesardeploymentmanager.eu/publications/deployment-programme</a>	
ATM Master Plan relationship:		<a href="#">[ER APP ATC 78]-Update FDP to support 4D trajectory direct segments in free routing airspace beyond local AoR</a>	
Finalisation criteria:		1 - The ANSP system has been updated according to the specifications representing the identified necessary changes	
AOM21.3-ASP03	Implement Enhanced FRA procedures and processes in support of the local dimension	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:		ANS Providers	
Description & purpose:		Take the following actions: <ul style="list-style-type: none"><li>• Adapt the LoA with adjacent ATS units;</li><li>• Publish relevant data for cross-border FRA in a single or multiple AIPs;</li><li>• Chart the Cross-border FRA and FRA connectivity with TMA operations;</li><li>• Develop airspace management procedure for the implementation of cross border FRA and FRA connectivity with TMAs operations;</li><li>• Identify and apply ASM Procedures for Cross-border FRA areas. ;</li><li>• Develop ATC procedures to cover Cross-border FRA and FRA connectivity with TMAs co-ordination and transfer of control, trajectory change in a free route environment, conflict detection;</li><li>• Validate airspace design, RAD and ASM procedures with NM.</li></ul> <a href="#">Note :This SLoA needs to be synchronised between ANSPs and NM.</a>	
Supporting material(s):		SDM - Standardisation and Regulation support to CP1 deployment 2021, Deliverable D1.1.1 07/2021 Url : <a href="https://www.sesardeploymentmanager.eu/publications/deployment-programme">https://www.sesardeploymentmanager.eu/publications/deployment-programme</a>	
ATM Master Plan relationship:		<a href="#">[PRO-085]-ATC procedures to cover issues such as hand-off, transfer of control, and for defining trajectory changes necessitated by changes in airspace availability, weather constraints and other non-nominal events</a> <a href="#">[PRO-148]-ASM Procedures for identifying and promulgating 'Free Route' areas</a>	
Finalisation criteria:		1 - The Final FRA, Cross border FRA and TMA connectivity airspace has been described and published in the AIP and the charts 2 - The Letters of Agreement have been updated if necessary 3 - The ASM and ATC procedures have been updated to take on board the impact of Final FRA, Cross border FRA and TMA connectivity.	
AOM21.3-ASP04	Safety Assessment	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:		ANS Providers	
Description & purpose:		The safety assessment of the changes must be developed and delivered to the competent authority.	
Finalisation criteria:		1 - Safety assessment has been developed and delivered to the competent authority.	
AOM21.3-ASP05	Training	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:		ANS Providers	
Description & purpose:		All relevant must must be duly trained.	
Finalisation criteria:		1 - Training has been completed	
AOM21.3-ASP06	Operational use	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:		ANS Providers	
Description & purpose:		Enhanced Free Route Airspace Operations is in operational use once the systems have been implemented, the procedures are in place, the safety assessment has been delivered and approved, and the training has been completed.	
Finalisation criteria:		1 - Enhanced Free Route Airspace Operations is put into service.	
AOM21.3-USE01	Implement Enhanced FRA system improvements	From:	By:

AOM21.3		Enhanced Free Route Airspace Operations	
		Applicability Area 1: 01/01/2021	Applicability Area 1: 31/12/2025
Action by:	Airspace Users		
Description & purpose:	Adapt as necessary the flight Planning system to support cross-border FRA as: <ul style="list-style-type: none"> <li>• Optimisation of free routing trajectory taking into account the ATM constraints including possible differences of FRA lower limit implementations throughout the flight.</li> </ul>		
ATM Master Plan relationship:	<a href="#">[AOC-ATM-10]-Modification of AOC/WOC-ATM trajectory management system (or new systems) to allow quality of service requested by NOP for pre-flight trajectory with dynamic routing</a>		
Finalisation criteria:	1 - Flight Planning system has been adapted as necessary		
AOM21.3-USE02	Implement Enhanced FRA procedures and processes	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:	Airspace Users		
Description & purpose:	Take the following actions: <ul style="list-style-type: none"> <li>• Develop and apply operational Procedures for Cross-border FRA and FRA connectivity with TMAs;</li> <li>• Develop and apply operational Procedures to take into account airspace and traffic constraints when planning a route.</li> </ul>		
Supporting material(s):	SDM - Standardisation and Regulation support to CP1 deployment 2021, Deliverable D1.1.1 07/2021 Url : <a href="https://www.sesardeploymentmanager.eu/publications/deployment-programme">https://www.sesardeploymentmanager.eu/publications/deployment-programme</a>		
Finalisation criteria:	1 - Procedures have been updated to take into account Final FRA, Cross border FRA and TMA connectivity.		
AOM21.3-USE03	Training	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:	Airspace Users		
Description & purpose:	All relevant staff must be duly trained.		
Finalisation criteria:	1 - Training has been completed		
AOM21.3-USE04	Operational use	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:	Airspace Users		
Description & purpose:	Enhanced Free Route Airspace Operations is in operational use once the systems have been implemented, the procedures are in place, the safety assessment has been delivered and approved, and the training has been completed.		
Finalisation criteria:	1 - Enhanced Free Route Airspace Operations is put into service		
AOM21.3-NM01	Implement Enhanced FRA system improvements	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:	NM		
Description & purpose:	Upgrade NM system to support: <ul style="list-style-type: none"> <li>• Environmental database adaptations for FRA cross-border operation and FRA connectivity with TMA;</li> <li>• Data exchange for cross border FRA and FRA connectivity with TMA;</li> </ul> Note :This SLoA needs to be synchronised between ANSPs, AUs and NM.		
Supporting material(s):	SDM - Standardisation and Regulation support to CP1 deployment 2021, Deliverable D1.1.1 07/2021 Url : <a href="https://www.sesardeploymentmanager.eu/publications/deployment-programme">https://www.sesardeploymentmanager.eu/publications/deployment-programme</a>		
ATM Master Plan relationship:	<a href="#">[AAMS-16a]-Airspace management functions equipped with tools able to deal with free-routing</a> <a href="#">[NIMS-36]-Enhanced Complexity assessment tools</a>		
Finalisation criteria:	1 - The required adaptations of NM systems (IFPS and Airspace Management tools) to Final FRA, Cross border FRA and TMA connectivity have been deployed.		
AOM21.3-NM02	Implement Enhanced FRA procedures and processes	From: Applicability Area 1: 01/01/2021	By: Applicability Area 1: 31/12/2025
Action by:	NM		

AOM21.3		Enhanced Free Route Airspace Operations	
Description & purpose:	Take the following actions in coordination with ANSPs:		
	<ul style="list-style-type: none"><li>• Identify the cross-border FRA airspace volume (Lateral and Vertical);</li><li>• Identify Cross-Border FRA entry and exit points, TMAs connection points, and intermediate points;</li><li>• Adapt Airspace design and ensure FRA horizontal and vertical connectivity;</li><li>• Network overview-connectivity consistency of FRA cross-border application;</li><li>• ATFCM Cross-border FRA procedures;</li><li>• Adapt RAD applicability;</li><li>• Validate airspace design, RAD and ASM procedures with ANSPs.</li></ul>		
Supporting material(s):	SDM - Standardisation and Regulation support to CP1 deployment 2021, Deliverable D1.1.1 07/2021 Url : <a href="https://www.sesardeploymentmanager.eu/publications/deployment-programme">https://www.sesardeploymentmanager.eu/publications/deployment-programme</a>		
ATM Master Plan relationship:	<a href="#">[PRO-148]-ASM Procedures for identifying and promulgating 'Free Route' areas</a>		
Finalisation criteria:	1 - European Airspace has been updated with the integration of the coordinated Final FRA, Cross border FRA and TMA connectivity definition 2 - Route Availability Document has been updated accordingly		
AOM21.3-NM03	Safety Assessment	From:	By:
		Applicability Area 1: 01/01/2021	Applicability Area 1: 31/12/2025
Action by:	NM		
Description & purpose:	The safety assessment of the changes must be developed and delivered to the competent authority		
Finalisation criteria:	1 - Safety assessment has been developed and delivered to the competent authority		
AOM21.3-NM04	Training	From:	By:
		Applicability Area 1: 01/01/2021	Applicability Area 1: 31/12/2025
Action by:	NM		
Description & purpose:	All relevant staff must be duly trained.		
Finalisation criteria:	1 - Training has been completed		
AOM21.3-NM05	Operational use	From:	By:
		Applicability Area 1: 01/01/2021	Applicability Area 1: 31/12/2025
Action by:	NM		
Description & purpose:	Enhanced Free Route Airspace Operations is in operational use once the systems have been implemented, the procedures are in place, the safety assessment has been delivered and approved, and the training has been completed.		
Finalisation criteria:	1 - Enhanced Free Route Airspace Operations is put into service.		

