AOM21.2 — Initial Free Route Airspace

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Free Route is an operational concept that enables airspace users to fly as close as possible to what they consider their optimal trajectory without the constraints of a fixed route network structure. Free Route Airspace (FRA) is a specified airspace within which users may freely plan a route between a defined FRA entry point and defined FRA exit point, with the possibility to route via intermediate (published or unpublished) waypoints, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.

The Initial FRA implementation may be achieved with some limitations, for example:

- laterally and vertically;
- during specific time periods;

The Initial FRA deployment shall be based on the following system improvements:

For NM systems:

• FPL processing and checking
• Dynamic rerouting
• Calculation and management of traffic load
• IFPS routing proposal
• Specific ASM improvements for FRA
• Network impact assessment for FRA
• CACD adaptations for FRA Initial deployment

For AU systems:

• FPL route planning for a complete flight taking into account the differences of limitations (e.g. in terms of opening time and/or flight level constraints) throughout the entire flight
• Long DCT with or without calculated intermediate points
• Capability to take into account different constraint e.g.: ATS, FRA, RAD, scenarios, FL constraints on part of the route only, etc
• FPL route planning for a complete flight taking into account the differences of implementations (FRA with or without partial implementation) throughout the entire flight.

ANSPs may decide which system improvements are needed for Initial FRA. The list below addresses the potential improvement to ATC systems. The choice of the appropriate tool/function to achieve Initial FRA remains a stakeholder decision based on the operational environment and may include any of the following tool/functions as follows:

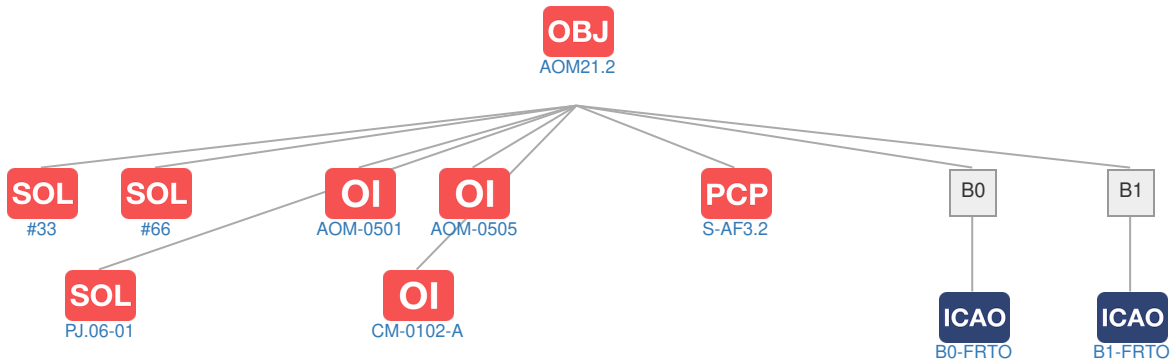
• FDPS supporting the airspace structure and managing trajectories according to the flight plan;
• CWP and HMI supporting appropriate display and functions as required by operational needs;
• FDPS to calculate ground 4D trajectories within AoI and editing function for 4D trajectories including Cross AoR Points (Coordination Point COP management);
• ASM/ATFCM for FRA management;
• MTCD (detecting conflicts between A/C and A/C, and between A/C and airspace);
• CORA (conflict probe and passive conflict resolution advisor);
• MONA (conformance monitoring aids);
• ATC clearances beyond AoR;
• ATC to ATC Flight Data Exchange (OLDI and/or SYSCO);
• Dynamic sectorisation and constraint management;
• Dynamic Area Proximity Warning (APW) –Integrated with ASM tools;
• Provision/integration of FPL and real-time data related to the FRA traffic to the Military ATS units and or air defence organisations;
• Conflict Detection Tools which include the Tactical Controller Tool (TCT), using the tactical trajectory and managing the clearances along that trajectory.

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.

Edition	2022
Stakeholders	Air Navigation Service Provider / Airspace Users / Network Manager
Type	CP1
Scope	ECAC+
Status	Active

Context

Related Elements



Applicability Area(s) and Timescales

Applicability Area 1: All EU SES States
(All EU SES States)

Applicability Area 2: Albania, Armenia, Bosnia and Herzegovina, Georgia, Moldova, Montenegro, Morocco, North Macedonia, Serbia, Türkiye, Ukraine, United Kingdom
(All ECAC+ States except AZ, BE, LU, IL, and NL)

Timescales	From	By	Applicable to
Initial operational capability	01-01-2015	-	Applicability Area 1 + Applicability Area 2
Full Operational Capability / Target Date	-	31-12-2022	Applicability Area 1 + Applicability Area 2

Links to ATM Master Plan Level 2

OI Operational Improvment Steps

Code	Title	IOC	FOC	Related Elements
AOM-0501	Free Routing for Flights both in cruise and vertically evolving within low to medium complexity environments	31-12-2020	01-10-2025	SOL OI EN OBJ DS PCP ICAO
AOM-0505	Free Routing for Flights both in cruise and vertically evolving within high and very high complexity environments in Upper En Route airspace	31-12-2026	31-12-2030	SOL OI EN OBJ DS PCP ICAO
CM-0102-A	Dynamic Sectorisation based on complexity	-	-	SOL OI EN OBJ DS PCP ICAO

SOL Links to SESAR Solutions

Code	Title	Program	Related Elements
#33	Free Route through Free Routing for Flights both in cruise and vertically evolving above a specified Flight Level	SESAR1	SOL OI OBJ DS EOC PCP ICAO
#66	Automated Support for Dynamic Sectorisation	SESAR1	SOL OI OBJ DS EOC PCP ICAO
PJ.06-01	Optimized traffic management to enable Free Routing in high and very high complexity environments.	SESAR 2020 Wave 1	SOL PJ OI OBJ DS EOC PCP ICAO

PCP Links to PCP ATM Sub-Functionalities

Code	Title	Related Elements
S-AF3.2	Free Route	SOL OI EN OBJ ICAO

ICAO ICAO Block Modules

Designator		Title	Related Elements
B0			
	B0-FRTO	Improved Operations through Enhanced En-Route Trajectories.	OI OBJ
B1			
	B1-FRTO	Improved Operations through Optimized ATS Routing	SOL OI OBJ PCP

References

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 ct
Applicable ICAO Annexes and other references
Annex 11, Doc 4444
Deployment Programme 2022
Family 3.2.1 - Initial FRA
Operating Environments
Terminal Airspace
En-Route
Network

Expected Performance Benefits

Safety	Although the main benefits impact the environment, FRA implementation has the ambition to at least maintain the current level of safety.
Capacity	Increased capacity through better airspace utilisation to and reduced controller workload.
Operational efficiency	Savings in route distances and fuel efficiency through increased use of preferred flight profiles.
Cost efficiency	-
Environment	Reductions in emissions through use of optimal routes.
Security	-

Stakeholder Lines of Action

Code	Title	From	By	Related Enablers
ASP01	Implement Initial FRA procedures and processes in support of the network dimension	01-01-2015	31-12-2022	EN
ASP02	Implement Initial FRA system improvements	01-01-2015	31-12-2022	EN
ASP03	Implement Initial FRA procedures and processes in support of the local dimension	01-01-2015	31-12-2022	EN
ASP04	Safety Assessment	01-01-2015	31-12-2022	
ASP05	Training	01-01-2015	31-12-2022	
ASP06	Operational use	01-01-2015	31-12-2022	
USE01	Implement Initial FRA system improvements	01-01-2015	31-12-2022	EN
USE02	Implement Initial FRA procedures and processes	01-01-2015	31-12-2022	
USE03	Training	01-01-2015	31-12-2022	
USE04	Operational use	01-01-2015	31-12-2022	
NM01	Implement Initial FRA system improvements	01-01-2015	31-12-2022	EN
NM02	Implement Initial FRA procedures and processes	01-01-2015	31-12-2022	EN
NM03	Safety Assessment	01-01-2015	31-12-2022	
NM04	Training	01-01-2015	31-12-2022	
NM05	Operational use	01-01-2015	31-12-2022	

Supporting Material

Title	Related SLoAs
EUROCONTROL - European Route Network Improvement Plan (ERNIP) Part 1 - European Airspace Design Methodology - Guidelines - 2.0 / 12/2018 https://www.eurocontrol.int/publication/european-route-network-improvement-plan-ernip-part-1	ASP01, ASP03, ASP04, ASP05, ASP06, NM01, NM02, USE02, USE04
EUROCONTROL - European Route Network Improvement Plan (ERNIP) Part 2 - European ATS Route Network - Version 2019-2024 - June 2019 / 07/2019 https://www.eurocontrol.int/publication/european-route-network-improvement-plan-ernip-part-2	NM02
EUROCONTROL - European Route Network Improvement Plan (ERNIP) Part 3 - Airspace Management Handbook - Guidelines for Airspace Management - 5.5 / 11/2017 https://www.eurocontrol.int/publication/european-route-network-improvement-plan-ernip-part-3	NM02
EUROCONTROL - GUID-161 - EUROCONTROL Guidelines for Area Proximity Warning - Part I to III - Edition 1.0 / 01/2017 https://www.eurocontrol.int/publication/eurocontrol-guidelines-area-proximity-warning	ASP02
EUROCONTROL - GUID-176 - EUROCONTROL Guidelines for On-Line Data Interchange (OLDI) - Edition 1.1 / 07/2020 https://www.eurocontrol.int/publication/eurocontrol-guidelines-line-data-interchange-oldi	ASP02
EUROCONTROL - SPEC-106 - EUROCONTROL Specification for On-Line Data Interchange (OLDI) - Edition 5.0 / 07/2020 https://www.eurocontrol.int/publication/eurocontrol-specification-line-data-interchange-oldi	ASP02
EUROCONTROL - SPEC-139 - EUROCONTROL Specification for Medium-Term Conflict Detection - Edition 2.0 / 03/2017 https://www.eurocontrol.int/publication/eurocontrol-specification-medium-term-conflict-detection-mtcd	ASP02
EUROCONTROL - SPEC-142 - EUROCONTROL Specification for Monitoring Aids - Edition 2.0 / 03/2017 https://www.eurocontrol.int/publication/eurocontrol-specification-monitoring-aids-mona	ASP02

Consultation & Approval

Working Arrangement in charge	NETOPS
Outline description approved in	03/2013
Latest objective review at expert level	05/2013
Commitment Decision Body	Provisional Council (PC)
Objective approved/endorsed in	07/2013
Latest change to objective approved/endorsed in	07/2014