



**Network Manager**  
nominated by  
the European Commission



# Free Route Airspace developments

**For a route-free European network**





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# 1. A CONSOLIDATED EUROPEAN APPROACH TOWARDS FREE ROUTE AIRSPACE

## 1.1 A Cooperative Network Approach

The coordinated development and implementation of Free Route Airspace was initiated by EUROCONTROL in 2008 and was included in the **Flight Efficiency Plan** developed cooperatively between IATA, CANSO and EUROCONTROL.

While the first implementation steps took place within the context of the European ATS Route Network Version 6 (**ARN Version-6**), the overall coordination was included in the **ARN Version-7**.

The ARN Version-7 was developed and deployed through a co-operative and partnership approach facilitated in the context of the Route Network Development Sub-Group (RNDSG). The RNDSG is the co-ordination forum for European airspace design and development, planning and implementation of improved European ATS route network, optimised civil and military airspace structures and ATC sectors. The members of the RNDSG work in a partnership approach, through civil and military experts in airspace design from EUROCONTROL, the ECAC member States and their ANS providers, airspace users organisations, flight planner organisations and other relevant international organisations.

With respect to Free Route Airspace, European ARN Version-7 included:

- The implementation of an advanced concept of operations, including Free Route Operations;
- A pan-European view of Free Route Airspace deployment.

Further evolutions followed through the approval of the the COMMISSION REGULATION (EU) No 677/2011 of 7 July 2011 (laying down the detailed rules for the implementation of air traffic management (ATM) network functions and amending Regulation (EU) No 691/2010. The Annex I of this Regulation describes the European Route Network Design Function and the European Route Network Improvement Plan.

The content of the European Route Network Improvement Plan will include “an agreed European route network and, where feasible, free route airspace structure designed to meet all user requirements”.

As part of the European Route Network Improvement Plan, the Network Manager developed the following material:

- **The European Route Network Improvement Plan (ERNIP) Part 1 - A European Airspace Design Methodology** – General Principles, Guidelines and Technical Specifications for airspace Design that includes a Free Route Airspace Concept;
- **The European Route Network Improvement Plan (ERNIP) Part 3 - ASM Handbook** – that includes all the necessary civil/military aspects related to Free Route Airspace;
- **The European Route Network Improvement Plan (ERNIP) Part 4 - Route Availability Document (RAD) User Manual** – that includes the appropriate route orientation and flight plan facilitating measures with respect to Free Route Airspace;
- **The European Route Network Improvement Plan (ERNIP) Part 2 - ARN Versions** – that include all the Free Route Airspace Projects scheduled for development and implementation over a 5-years rolling period;
- **FRA Application in NMOC** – Guidelines are supplementary to ERNIP Part 1 – Chapter 6, Section 6.5 FRA Concept. Those Guidelines are relevant for the entire process of NMOC FRA Operational Validation and NMOC FRA system processing. They cover the most significant aspects to be known by Operational Stakeholders and can be considered as support to planning, development and validation of any FRA project. The document contains the explanation of how NMOC systems process FRA. How to express FRA in NMOC systems by using the existing airspace utilisation rules and availability restrictions, as well as what shall be presented to NM in order for it to perform FRA Operational Validation.

## 1.2 The Need for a Coordinated Approach

A number of States, ANSPs and FABs have proposed in 2007 development towards the implementation of Free Route Airspace. The common thread of these initiatives was the transition from reliance on a fixed route network to offering direct routes and tailored routes in order to contribute to airspace performance improvements on capacity, efficiency and environment.

These initiatives come at a time when there are very demanding economic and environmental pressures on the Aircraft Operators and other stakeholders. The network has to respond to this and the States and ANSPs should look at innovative and obvious methods to make their contribution.

The implementation of Free Route Airspace initiatives will, in the short term, go some way to meeting the efficiency, capacity, and environmental challenges.

They will be the starting point on the path to full Free Routing across the European airspace, which itself is an intermediate step on the road to SESAR business trajectories and 4D profiles.

The local Free Route Airspace Initiatives will bring improvements to the Network but if they are to develop further, they will also bring new demands on Network Management and System Support.

## 1.3 Bringing the Network Contribution

In order to respond to a clear need from all operational stakeholders, EUROCONTROL put in place a flexible but purposeful approach where individual States, ANSPs or FABs can move at a much quicker pace than they would if they were bound into a larger project. The need for a greater visible picture and for coordination was put in place and developed in harmony.

At a European level, EUROCONTROL started to offer pro-active coordination and technical and operational support to the local or sub-regional Free Route Airspace and ensured that the required network improvements were in place to support these initiatives.

The coordination and support tasks covered:

- The development of an European Free Route Airspace Concept in the context of the ARN Version 7 and then in the context of the European Route Network Improvement Plan (ERNIP) Part 1;
- Providing an overall focal point that will consolidate and circulate information on initiatives, plans and proposals;
- Support to the airspace design and utilisation projects for individual ANSPs, FABs or groups of ANSPs and FABs;
- Technical and operational support to ensure mainly that there is harmonisation between the initiatives and that there is a common approach towards operational aspects;
- Identification of the required network enablers, in particular:
  - System adaptation and compatibility across the network;
  - Harmonised AIS publication;
  - Checklist of Free Route Airspace implementation actions;
  - Fast Time Simulation evaluations of workload and capacity
  - Running of large scale Real Time Simulations
  - Enhanced flight planning procedures;
  - Initiating work at network level to ensure that enablers will be available;
  - Supporting airspace design and ASM/ATFCM processes at network, FAB and local level;
  - Support to a co-ordinated deployment of local, sub-regional and network aspects of these initiatives;
  - Validation of airspace design and utilisation projects through the Network Manager Operations Centre (NMOC);
  - Coordination on the development of the network systems and operational procedures.

## 2. FREE ROUTE AIRSPACE (FRA) DESIGN

### 2.1 FRA Concept Definition

A specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) way points, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.

### 2.2 Scope

The overall scope of the Free Route Airspace (FRA) Concept is to provide an enabling framework for the harmonised implementation of FRA in Europe whenever a State/FAB/ANSP, a group of States/FABs/ANSPs decides to proceed with such implementation.

The FRA Concept forms the basis for a common understanding for all ATM partners involved in FRA implementation. The FRA Concept encompasses various FRA implementation scenarios that will:

- Meet the Safety Objectives;
- Be compatible with existing operations;
- Be sustainable through further development;
- Be capable of expansion/connectivity to/with adjacent airspace;
- Be capable of being exported to other regions.

### 2.3 Enablers

The enablers are:

- Appropriate System Support - enhancement for the purposes of Flight Planning and ATFCM;
- Procedures - enhanced procedures where necessary for operations within FRA and at its interfaces;
- Adaptations to airspace structures;
- Adaptations to airspace management procedures;

- No additional equipment requirements or flight planning procedures changes are foreseen for aircraft operators. Nevertheless, modifications to flight planning systems may be required to ensure that full benefit of the FRA can be realised.

### 2.4 Airspace Classification

FRA will, in principle be classified as Class C airspace, with certain agreed exemptions (e.g. above FL460, within the NOTA).

### 2.5 Flight Level Orientation

The Flight Level Orientation Scheme (FLOS) applicable within FRA shall be promulgated through the relevant national AIS publications.

*Note: This does not constitute a change to the current system of 2 FLOS in Europe*

### 2.6 Limited Applicability of FRA

#### 2.6.1 Time Limited

Even though the goal is to implement FRA on a permanent basis, a limited implementation during defined periods could facilitate early implementation. Procedures for transitioning between FRA and fixed ATS route operations shall be set.

#### 2.6.2 Structurally Limited

In complex airspace, the full implementation of FRA could potentially have a detrimental effect on capacity. In such airspace, States/FABs/ANSPs may decide to implement FRA on a structurally limited basis, for example by restricting the available FRA Horizontal entry/exit points for certain traffic flows, which could increase predictability and reduce the number of potential conflicts.

## 2.7 Airspace Organisation

### 2.7.1 General

FRA forms an integral part of the overall European ATM network, interfacing vertically or laterally with adjoining fixed ATS route operations airspace.

Airspace reservations will remain, and as all airspace users will have equal access to FRA, harmonised application of the FUA Concept and Civil/Military Coordination are taken into account in order to ensure harmonised procedures and service provision for the benefit of all the airspace users.

### 2.7.2 Applicable Airspace

The FRA Concept is applicable to any area where FRA is implemented within the European airspace network.

### 2.7.3 Vertical Limits of FRA and Their Publication

This FRA Concept is aimed at facilitating the harmonised implementation of FRA wherever and whenever a State/FAB/ANSP decides to do so. In this context, there is no specific recommendation on the minimum FL of such implementation.

The vertical limits of the FRA shall be published in national AIS Publications.

The setting of the lower limit of FRA shall not adversely impact adjacent areas where FRA is not yet implemented or where only limited application of FRA is in place.

Nevertheless, with goal being a harmonised airspace structure across the European network, the following recommendations are made:

- The lower vertical limit shall be coordinated at European network level to ensure interconnectivity with adjoining airspace and this could vary in different areas or at different times within a particular FRA.
- The minimum level should be the lowest feasible, taking into account the complexity of the airspace and the demand.

### 2.7.4 Horizontal Limits of FRA and Their Publication

The horizontal limits of the FRA shall be published in national AIS Publications. In order to gain full benefits from its applicability, the horizontal limits should be preferably based on operational requirements, not necessarily on FIR/UIR or ATC unit boundaries.

FRA Horizontal entry/exit points into/out of the FRA shall be published in national AIS publications with a clear reference to the FRA and to the nature of the point (entry, exit or entry/exit point).

In areas where the shape of the lateral boundaries of an FIR/UIR or ATC unit are such that direct routings could lead to exiting for a short time into adjacent airspace, all efforts shall be made to ensure that applicability of FRA is organised based on operational requirements and appropriate arrangements are made with the adjacent ATC units/States. If such situations are unavoidable, the appropriate publication of FRA Horizontal entry/exit points shall be ensured.

If FRA is implemented in adjacent FIRs/UIRs, the publication of the FRA shall clearly reflect this cross-border application. The publication of FRA Horizontal entry/exit points on the common FIR/UIR boundary is not necessary from an operational perspective.

FRA Horizontal entry/exit points into/out of FRA shall take into account adjacent airspace where FRA is not implemented. FRA Horizontal entry/exit points will be defined to allow for a structured transition between the two operational environments, this may not necessarily be at the FIR or ATC unit boundary.

In order to ensure overall European airspace structure interconnectivity, the FRA Horizontal entry/exit points from/into adjacent non FRA shall ensure interconnectivity with the fixed ATS route network.

### 2.7.5 Vertical Connection between FRA and the underlying Fixed ATS Route Network

The vertical connection between FRA and the underlying fixed ATS route network shall take into account the various climbing and descending profiles. The interconnectivity between FRA and the underlying fixed ATS route network shall be ensured through the availability of a set of waypoints reflecting the typical climbing/descending profiles. The publication of extended SIDs/STARs or published connecting ATS routes are also operationally recommended options.

## 2.8 Maximising Efficiency of FRA

To maximise the efficiency of FRA and to ensure safe and efficient transfer of flight, all efforts need to be made to ensure any required realignment of the fixed ATS route network in adjacent airspace not applying FRA. Wherever a fixed ATS route network will remain in operation below the FRA, this underlying ATS route network shall be refined and coordinated at network level to take into account the needs of free route operations in the airspace above.

## 2.9 Access To/From Terminal Airspace

Access to/from Terminal Airspace will need to be considered and appropriate refinements to TMA structures initiated, including the definition of additional SIDs/STARs to permit more flexibility. This could have implications for the management of Terminal airspace.

### Notes:

1. *In case of implementation of FRA down to the upper limit of Terminal Airspace, the entry/exit points into/out of FRA should preferably be the last point of the SID and the first point of the STAR. In some cases a redesign of the SID/STAR will be required and, depending on airspace complexity, extensions may need to be investigated to ensure appropriate traffic segregation.*
2. *If for some airports no suitable SID/STAR is available, flight planning through the use of DCT should be facilitated.*

## 2.10 Publication of a Contingency ATS Route Network

There is no over-arching requirement for a European contingency fixed ATS route network.

## 2.11 Maintenance of a Fixed ATS Route Network within FRA

Wherever a fixed ATS route network is maintained within FRA, details shall be published in AIS publications.

## 2.12 Airspace Reservations

In the context of FRA Concept, “airspace reservation” refers to airspace of defined dimensions for the exclusive use of specific users, including TRA, TSA, CBAs, D, R, P, Areas and any specially activated areas. These are special designed areas within which both civil and military activities could take place.

Airspace reservations are permanently active (such as prohibited areas) while others are active for varying periods of time and at varying levels. (e.g. TSA and similar exercise areas). Active airspace reservations are crossed or avoided depending on the degree of coordination (including civil/military coordination) and the status of the activity in the area. This will remain the case in FRA.

There is the potential for airspace reservations to be reconfigured to meet different task needs.

In areas where coordination procedures (including civil/military coordination procedures) and airspace conditions permit, the airspace users are permitted to flight plan routings through airspace reservations.

In some cases, tactical rerouting will be given if airspace is not available for crossing. The expected maximum additional length of a tactical rerouting shall be promulgated through national AIS publications.

In other cases, when such airspace is not available for crossing, FRA intermediate points will be defined to facilitate flight planning clear of the airspace reservation and ensure sufficient separation from the activity. The promulgation of these FRA intermediate points shall be ensured through national AIS Publication. If these points are to be used only for avoidance of airspace reservations, specific conditions for the use of these points for flight planning shall be published in the RAD. An overall standardisation of the separation from airspace reservations will be required, in the longer term, especially for cross-border operations.

Publication of activation time of airspace reservations should be considered.

**Note:** *The possibility of using geographical coordinates should be considered.*



Procedures shall be developed between the Network Manager Operations Centre (NMOC) and all interested parties to ensure a harmonised application of procedures for the avoidance of airspace reservations.

## 2.13 Route Availability

The role, format and applicability of the Route Availability Document (RAD) have been adapted to accommodate FRA requirements.

## 2.14 Sectorisation

The present sectorisation scheme may need to be restructured to accommodate traffic flows both within FRA and according to the underlying fixed ATS route network. Instead of having regularised flows of traffic along the ATS route network crossing at recognised points, the traffic will potentially be spread across the whole of a sector.

Sector design will need to respond to this change and may need to be more flexible as traffic demand varies. The Free Route Airspace sectors should be:

- Unconstrained by FIR/UIR or State boundaries.
- Capable of being reconfigured to meet demand. A structured methodology where sectors are taken from a library of designs already known to the internal and external systems is likely in areas where there are significant fluctuations of traffic flow orientation. Changes to sector definition will need to be notified to the Network Manager Operations Centre (NMOC) and should be transparent to adjacent units.

Sector Design Criteria should, at least, take into account:

- the principle traffic flows and orientation;
- minimising short transits through sectors;
- minimising sector and ACC re-entry;
- positions of airspace reservations;
- coherency with adjoining fixed ATS route network sectors and connecting ATS routes to SIDs/STARs;
- civil/military coordination aspects.

Sectors shall be aligned as far as possible so that the number of flights with short transit times is reduced to a minimum. If this is not feasible such traffic should be exempted from Network Manager traffic counts. Appropriate rules shall be set in this context.

More flexibility in defining a larger number of elementary sectors/airspace volumes and sector configurations will need to be explored. Sectors will need to be designed to minimise short transits and to avoid sector/ATC unit re-entry of flights. Operationally designed, cross-border sectors may be needed where FRA is implemented in adjacent areas.

A more extensive application of cross-border sectors is likely to be required to reflect better variations of traffic patterns. Local FMPs will have to take a more proactive role in the selection of optimum sector configurations. Active sector configurations shall be dynamically communicated to the Network Manager Operations Centre (NMOC).

## 2.15 Sector and Traffic Volumes Capacities/Monitoring Values

Sector capacities shall take into account the more dynamic variations of traffic patterns. Definition of traffic volume capacities/monitoring values shall take into account a minimum transit time. Appropriate procedures shall be put in place by the Network Manager Operations Centre (NMOC) to exempt such flows from sector traffic counts.

## 2.16 ATS Delegation

In areas where operational boundaries do not coincide with FIR/UIR boundaries, and delegation of ATS is effective the operational boundaries of FRA shall be published in the national AIS publications of both States. The Letters of Agreement between the concerned ATS units shall be amended accordingly to reflect any changes to the applicable procedures in the airspace where ATS is delegated.

## 2.17 Airspace Management

### 2.17.1 General

ASM in FRA will differ from that of the fixed ATS route network in that AOs will no longer be given information on which routes are available, but will need to know which airspace is available/not available. For the transit period of a given flight through FRA, the airspace users will need to know the activity of all pertinent airspace reservations areas to enable the selection of a flight path that will avoid them.





ATC units, corresponding military authorities, airspace users and the Network Manager will need to know and share the same updated information with regard to activity of airspace reservations.

Applicable procedures are available in the European Route Network Improvement Plan - Part 3 - ASM Handbook - Guidelines for Airspace Management.

### 2.17.2 OAT Handling

OAT en-route shall benefit in a similar way from the implementation of FRA. There is no identified need for maintaining an OAT route structure within FRA.

## 2.18 Letters of Agreement and Coordination Procedures

Letters of Agreement shall be adapted to reflect the specificities of FRA in regard to transfer points, flexible changes in sectorisation, links with the fixed ATS route network, high fluctuations in traffic flows, possibility to leave/enter the airspace at random points, etc.

Appropriate mentioning of ATS delegation in areas involving FRA shall be fully considered.

The automatic exchange of flight data between ACCs/ UACs will need to consider the possibility of transfer at random points.

Transfer procedures and restrictions currently stipulated in the existing Letters of Agreement may no longer be applicable in Free Route Airspace. Appropriate procedures shall be defined to reflect these new provisions.

## 2.19 Flight Planning

### 2.19.1 General

Within FRA, flight planning procedures are needed that are understandable and easy to use and that are coherent with procedures for the fixed ATS route network.

Principles are outlined for GAT and OAT flight-planning, dealing primarily with GAT but will specifically mention OAT requirements where necessary.

Except in FRA where it is published that tactical rerouting will be given, the onus is on the originator of a FPL

to submit a routeing through Free Route Airspace that avoids active airspace reservations.

ATC, AOs and the Network Manager Operations Centre (NMOC) should have the same information regarding the intended profile and routing of a flight, regarding both the initial flight plan and any subsequent revisions to that information. The development of appropriate tools will indicate real time and future activity status of airspace reservations to all users.

Within the FRA there will be no limitations on the use of DCT, other than those recommended by ICAO.

Changes to airspace users' flight planning systems may be required to enable all airspace users to take full benefit of the FRA.

The IFPS will be modified to enable flight plan processing and checking in the context of variable lower levels of FRA in various parts of the European airspace. Similarly, the IFPS shall enable appropriate flight plan processing and checking for the transition from FRA to fixed ATS route network airspace whenever FRA will be implemented for limited time periods, e.g. during night time only.

### 2.19.2 Flight Plan Format

No change is envisaged to the ICAO flight-plan format in respect of FRA. OAT flight plans shall continue to comply with national regulations.

### 2.19.3 Use of Unpublished Intermediate Points for Flight Planning

In order to benefit from the best operating conditions, airspace users may be allowed to use any intermediate unpublished points for flight planning defined by geographical coordinates or by bearing and distance. Such possibility shall be clearly promulgated in national AIS publications. Where such utilisation is not possible, publication of FRA Intermediate points shall be ensured.

### 2.19.4 Flight Planning Routeings Through Airspace Reservations

For the transit period of a given flight through FRA, the AO will need to know the activity of all pertinent airspace reservations areas to enable the selection of a route that will avoid them, except where none are published and tactical re-routeing is provided. The requirement for 'hard checking' of such flight plans needs to be considered.





The selection of the route shall be based on the FRA Intermediate points published to this effect.

In areas where civil/military coordination procedures and airspace conditions permit, the airspace users can be allowed to flight plan through airspace reservations. Tactical re-routings could be expected in case of areas not being available for civil operations.

### **2.19.5 Route Description**

FRA published significant points or unpublished points defined by geographical coordinates or by bearing and distance shall be described using the standard ICAO format. Route portions between all these FRA points shall be indicated by means of DCT in accordance with ICAO Doc 4444.

### **2.19.6 Flight Planning Facilitation Through the Use of DCTs**

The use of published FRA Horizontal entry points with associated FRA Horizontal exit points might be required in certain cases to facilitate flight planning in FRA. This is especially valid in cases where only limited combinations of entry/exit points are permitted within FRA. Similarly, a number of DCTs might not be allowed for use by the airspace users. The publication of such DCTs will be ensured at network level, through the RAD. This approach shall ensure the respect of the status of airspace within various FIRs (e.g. min/max FLs, avoiding penetration of uncontrolled airspace, availability period, etc.).

### **2.19.7 Cruising FL Change**

The airspace users may use any published significant point or unpublished point, defined by geographical coordinates or by bearing and distance for indicating changes to the cruising FL. The airspace users shall observe the Flight Level Orientation Scheme applicable within the respective FRA.

### **2.19.8 Flight Plan Submission**

GAT flight-plans will be submitted to IFPS within the appropriate time-parameter. RPLs may continue to be submitted for flights that will transit FRA, but they might not have the full benefit of optimum route selection derived from precise information on airspace availability. They will continue to be checked by IFPS following normal procedures for proposing alternative routes when necessary.

Flight plan filing limitations shall be promulgated for areas where FRA is structurally limited - i.e. only limited combinations of entry/exit points are permitted.

### **2.19.9 Flight Plan Checking and Correction**

In addition to the normal flight plan validation rules within IFPS, the flight-planned route through FRA airspace shall be considered invalid if it:

- Fails to comply with published FRA Horizontal entry/exit, FRA Departure/Arrival Connecting Points and any other airspace utilisation requirements;
- Infringes an airspace reservation.

The flight plan shall also follow the published FLOS for the corresponding airspace.

In proposing alternative routes, IFPS will not be able to consider all the varying AO criteria for route selection. IFPS will propose routes on the basis of shortest distance and/or alternative FL above or below airspace reservations.

In case of time-limited application of FRA, IFPS shall check the flight plan to ensure that it complies with the time parameters of the FRA.

### **2.19.10 Flight Plan Distribution**

Real time updates to airspace availability should lead to a recalculation of the submitted flight profile by IFPS before the FPL is distributed. To ensure that



subsequent route corrections can be offered for affected flights, an appropriate distribution time parameter will need to be set. Once this parameter has passed and FPLs are distributed, further route updates will not be processed.

Flight Plans shall be distributed to appropriate ATS providers, relevant military organisations and other authorised parties decided by National Authorities. The IFPS shall ensure the appropriate calculation of the flight profile to enable a correct distribution of the flight plan to all interested parties.

For large scale applications of free route airspace, the flight plan distribution will need to be ensured to the appropriate ATC units and sectors, hence the importance of having updated information on active sector configurations. In addition, the ATC units, the airspace users and NMOC will need access to exactly the same information, both for the initial flight plan and subsequent updates. The importance of completely up-to-date information on the status of airspace reservations is to be again underlined.

#### 2.19.11 DCT Limits

Existing limitations on the DCTs (in distance and for cross border DCTs) will need to be reviewed.

The current DCT limits are applicable to an administrative airspace (FIR/UIR) which does not always coincide with the operational airspace boundaries. In case of ATS delegation, this prevents the creation of a DCT covering the complete operational airspace.

The possibility of flight planning DCT across two or more FIR/UIR boundaries shall be made available. This will require IFPS to compute and communicate to all ACCs entry/exit positions for their area of responsibility. If the DCT limits are different in the airspace below the FRA, the IFPS calculation could raise errors for traffic flying in both airspaces. This is the case for the traffic climbing/descending between the FRA and the fixed ATS route network.

## 2.20 Air Traffic Flow and Capacity Management

### 2.20.1 General

Airspace users shall comply with normal ATFCM procedures both within and outside FRA.

Large scale applications of free route airspace or implementation of free route operations in adjacent ATC units will generate a large variation of trajectories. Real-time updates of the airspace situation with respect to both sector configurations and airspace reservations will be required in order to offer the most updated ATFCM situation at network/local levels.

### 2.20.2 Sector Configuration Management

In areas where adjacent airspace is FRA, the volatility of the traffic flows will be higher than today. This will require a larger number of elementary sectors, a larger number of sector configurations and a more flexible and dynamic adaptation of the sector configuration to the traffic demand/pattern.

Changes to sector configurations will need to be notified in real time to the Network Manager Operations Centre (NMOC) to enable optimum network management actions. Appropriate procedures and system support to enable this flexibility shall be required. System support shall be in place to better predict trajectories in an environment where trajectories will be more volatile than in a fixed ATS route network.

In addition, procedures need to be defined to allow the Network Manager Operations Centre (NMOC), through collaborative decision making processes, to propose the most optimum configurations, taking into account the expected traffic pattern at network level.

Variable sector monitoring values, communicated in real time to the Network Manager Operations Centre (NMOC), will be required to reflect the changing traffic complexity.



### **2.20.3 Sector and Traffic Volumes Capacities/ Monitoring Values**

The use of traffic volumes and exclusions will need to be considered, as large variations in traffic patterns could appear in the context of large scale applications of free route airspace or even when two adjacent ATC units allow free route operations.

### **2.20.4 Letters of Agreement Restrictions**

A number of restrictions currently stipulated in the existing Letters of Agreement and implemented by the Network Manager Operations Centre (NMOC) for flight planning or ATFCM purposes may no longer be applicable in free route airspace. Such provisions will need to be reviewed.

### **2.20.5 Re-Routeing Proposals**

The possibility for IFPS to propose routes to airspace users, taking into account the best operating conditions in free route airspace, shall be considered. New procedures will be required to define rerouting within free route airspace. System support will be required to facilitate this task. The provision of a time window for the period the FPL/RPL will be suspended or invalid should be considered (FLS/REJ).

### **2.20.6 ATFCM/IFPS Tool Support**

The management of FRA is different to that of the fixed ATS route network and the Network Manager Operations Centre (NMOC) will need additional system support and new procedures in certain areas such as:

- Taking into account routing schemes outside FRA;
- The expected increase in RPL updates;
- Tools for ATFCM planning within FRA;
- Tools for re-routeing;
- Tool to calculate and manage traffic loads at a local level (FMP) and central level.



# 3. FRA PUBLICATION ASPECTS

## 3.1 FRA – AIP Publication

### 3.1.1 Terminology in GEN 2.2 Abbreviations used in AIS publications

Common terminology and relevant terms/abbreviations for FRA operations will be used and published in the AIP, GEN 2.2.

A general Glossary of FRA Terms/Abbreviations is available in the paragraph 6.5.4. This may not be an exhaustive list and as such does not prevent States to insert additional FRA terms/abbreviations if required. The FRA relevant terms/abbreviations that are not defined in ICAO Doc 8400, will be marked with an asterisk to indicate “non-ICAO” status - in accordance with ICAO SARPs. It is important that, for those “non-ICAO” terms/abbreviations, the harmonised terminology presented in paragraph 6.5.4 is used.

In accordance with ICAO Annex 15, a list of alphabetically arranged definitions/glossary of terms can also be added in GEN 2.2.

### 3.1.2 FRA General Procedures in ENR 1.3 Instrument Flight Rules

Procedures related to the FRA, including explanation and definitions of applied FRA relevant points, will be described in a dedicated AIP section.

As the FRA procedures are seen as supplementary to the general IFR procedures, they will be described in the AIP section ENR 1.3 Instrument Flight Rules.

To adhere to the ICAO AIP template structure to the maximum extent, a new (additional) sub-section - ENR 1.3.4 “Free Route Airspace - general procedures” will be created (see paragraph 6.5.5 for detailed content).

In case of cross-border FRA implementation, the involved FIRs/UIRs or CTAs/UTAs shall be indicated in ENR 1.3.

#### Notes:

1. *IFRA procedures specifically related to flight planning and submission of a correct flight plan shall be published in AIP section ENR 1.10 Flight planning.*
2. *Definitions of applied FRA relevant points are appropriate in ENR 1.3 together with information on FRA general procedures, recognising that publication of a list of definitions in GEN 2.2 is not mandatory.*

### 3.1.3 Flight planning in ENR 1.10

Within FRA, flight planning procedures need to be understandable, easy to use and coherent with procedures for the fixed ATS route network. National AIPs should provide clear procedures and principles for FRA flight planning; such procedures must be harmonised to the largest possible extent.

ENR 1.10 (ref. ICAO Annex 15, Appendix 1) is the placeholder for information relevant for FRA flight planning for eligible flights, enabling of correct flight planning and submission of a flight plan. This relates to e.g. usage of significant points for flight planning purposes and/or instructions of mandatory items and/or format of the information, enabling the completion of the flight plan.

Any special cases, e.g. rules on availability and/or, restrictions for flight planning shall be considered to be published in the framework of utilisation through the Route Availability Document (RAD). In this case, the RAD promulgation in AIP shall be made in accordance with ERNIP Part 1, Annex 3.

Instructions regarding DCT which could be filed in the flight plan in accordance with ICAO Doc 4444, Appendix 2, FLIGHT PLAN, ITEM 15, (c) Route (including changes of speed, level and/or flight rules), could be inserted in a dedicated subsection of AIP ENR 1.10.

*Example: Instruction on DCT limitations/usage in the flight plan could be placed under AIP ENR 1.10.5:*

*“... Use of “DCT” in flight plan, Item 15, (c) Route (including changes of speed, level and/or flight rules)...”*

### 3.1.4 Free Route Airspace structures in ENR 2.1 and ENR 2.2 - General rule

The FRA structures, including sectors, will be published in:

- **ENR 2.1 FIR, UIR, TMA and CTA** - if based on FIR/UIR or ATC unit boundaries:
  - If the FRA structure coincides entirely with the published lateral/vertical limits of the FIR/UIR or the area of responsibility of the ATC unit, only a reference to FRA operations to the respective airspace needs to be published in the Remarks column.



- If the FRA structure coincides entirely with the lateral limits of the published FIR/UIR or the area of responsibility of the ATC unit, but applies other vertical limits, insert the applicable FRA vertical limits in the Remarks column to the respective airspace.

Or

- **ENR 2.2 Other regulated airspace** - if the FRA lateral limits do not coincide with FIR/UIR or ATS unit boundaries.

### 3.1.5 Cross-border application of FRA in ENR 2.2 Other regulated airspace

If FRA is implemented cross-border between adjacent FIRs/UIRs or CTAs/UTAs, the publication of the FRA information shall clearly reflect this cross-border application.

In addition to inserting in ENR 1.3 information on the involved FIRs/UIRs or CTAs/UTAs, the ENR 2.2 is the adequate placeholder for description of the cross-border FRA structure.

Cross-border sectors (e.g. applicable ATC sectors, portions of CTA/UTA) may be defined where FRA is implemented in adjacent FIRs/UIRs or CTAs/UTAs. ENR 2.2 is the adequate placeholder for publication of these sectors (as the sector borders do not coincide with FIR/UIR boundaries, see general rule).

**Note:** *The publication of FIR/UIR crossing points (5LNC in ENR 4.4) on the common boundary is not necessary, unless required for operational reasons. In that case, a reference to the other State(s) AIP(s) is made for common crossing points in ENR 4.4.*

It is recommended to only publish in AIP ENR 2.2 the State's FRA area up to the border of the FIR/UIR (geographical coordinates, vertical limits, FRA name/ID, information on involved FIR/UIR, ATC unit providing the service and any other relevant information) instead of the total FRA area, and refer to the other involved States' AIPs for continuing information.

**Note:** *This practice allows adhering to current ICAO provisions on publication and allows from a data management perspective constructing the overall FRA volume in accordance with involved Data Providers' respective EAD area of responsibility.*

The boundary of the total area for the involved (cross-border) FIR/UIRs may be described in ENR 2.2 if the same vertical limits apply, with the FRA name/ID, geographical coordinates, vertical limits, and information on involved FIR/UIR.

### 3.1.6 Delegation of the responsibility for provision of ATS in ENR 2.2 Other regulated airspace

Appropriate AIP publication of areas where the responsibility for provision of ATS is delegated shall be assured, in order to facilitate the publication of the FRA applicability in these areas.

The following AIP placeholders are available in the ICAO AIP Specimen (Doc 8126) for publication of delegation of the responsibility for provision of ATS:

- **GEN 3.3 - Air Traffic Services**
  - GEN 3.3.2 Area of Responsibility
    - Brief description of area of responsibility for which air traffic services are provided
- **ENR 2.2 Other regulated airspace**
  - ENR 2.2.2 The area involved in the transfer of ATS responsibility
    - Details on the description of the areas within another bordering FIR where ATS is provided under delegated authority as part of the area of responsibility, and the provided services (ATC unit).

While publication of ATS responsibility in GEN 3.3 does not need to be re-assessed, appropriate publishing of ATS delegation in areas involving FRA shall be fully considered.

In line with the FRA Concept, FRA should preferably apply in the entire Area of Responsibility (AoR) of an ATC unit providing the service, including the areas where the ATS responsibility is delegated.

In case of ATS delegation, FRA boundaries shall be either published in both State AIPs or a reference to the other State(s) AIP(s) is made.

In the case where delegation of ATS is effective and where the ATC unit providing the service has implemented FRA in its AoR, but by agreement between the States/FABs/ANSPs concerned it is decided that FRA shall not apply in one (or more) delegated area(s), the operational boundaries of FRA shall be published in the AIPs of both States in ENR 2.2 (ref. section 6.5.1).



### 3.1.7 FRA Connecting Routes to/from terminal airspace and aerodromes

In the context of the FRA concept, access to/from terminal airspace and connection to/from aerodromes need to be considered. This may require definition of FRA connecting routes to facilitate flight planning, providing e.g. the route from FRA departure/arrival points to a published SID/STAR points at an aerodrome, or from/to an aerodrome within the TMA which does not have SID/STAR.

For the publication of defined FRA connecting ATS routes, the AIP placeholder ENR 3.5 may be used, with a dedicated section named "FRA Connecting Routes". This placeholder is appropriate for publishing the complete connecting route package for a terminal area. The description of established connecting routes shall be coherent with published FRA general procedures in ENR 1.3 and flight planning instructions for FRA published in ENR 1.10.

Alternatively, the description of the FRA connecting routes can also be published together with details on flight procedures (AD 2.21 Flight procedures) for the aerodrome concern, if appropriate.

### 3.1.8 FRA Significant Points in ENR 4.1 and ENR 4.4

FRA significant points will be published in national AIPs with a clear reference to the Free Route Airspace and to indicate the FRA relevance of the point.

As NAVAIDs can be used as a FRA significant point, the publication of appropriate FRA relevance shall be considered for publication also for en-route navigation aids.

Publication of FRA relevance on 5LNC and navigation aids - en-route falls under:

- **ENR 4.1 Radio navigation aids - en-route;** and
- **ENR 4.4 Name-code designators for significant points.**

For information on FRA (ref. Annex 15, Appendix 1), the Remarks column in ENR 4.1 and ENR 4.4 tables shall be used to specify specific information with respect to FRA usage, if needed.

**Note:** *Specific conditions of utilization e.g. use for arrivals/departures to/from specific aerodromes shall be described in the RAD.*

Or, by an extension to the ENR 4.1 and 4.4 tables, by adding one column.

The FRA relevance of the significant points shall be indicated by the following letters and published within brackets:

- (E), for "FRA Horizontal Entry Point"
- (X), for "FRA Horizontal Exit Point"
- (I), for "FRA Intermediate Point"
- (A), for "FRA Arrival Connecting Point"
- (D), for "FRA Departure Connecting Point"

Combinations of letters can be published in accordance with this matrix:

E	EA		
X		XD	EXAD
EX	EXA	EXD	EXADI
I	IA	ID	IAD
	A	D	AD

The fictitious AIP publication examples below are based on the ICAO Annex 15, Appendix 1 on required information for ENR 4.1 and 4.4, and include adapted tables with the option to an additional column for information of FRA relevance.

The explanation of the letters may be published in textual format in conjunction to the ENR 4.1 tables (see examples below).



**Example 1:**

ENR 4.1 Radio navigation aids - en-route

Legend for FRA relevance: (E) = "Horizontal Entry point", (X) = "Horizontal Exit point", (I) = "Intermediate point", (A) = "Arrival Connecting point", (D) = "Departure Connection point".

**Option 1 – additional text in column (7) for FRA relevant information**

Name of station (VAR) (VOR: Declination)	ID	FREQ (CH)	Hours of operations	Coordinates	ELEV DME antenna (ft)	Remarks
1	2	3	4	5	6	7
AALBORG VOR (1°E 2008)	AAL	116.700MHZ	H24	570613N 0095944E		DOC FL 500/100 NM <b>FRA (I)</b> To plan when D370 is activated
KORSA VOR/DME (1°E 2008)	KOR	112.800MHZ CH75Y	H24	552622N 0113754N	136.2	DOC FL 500/80NM <b>FRA (A)</b> STAR EKCH and EKRK

**Option 2 – additional column (7) for FRA relevant information**

Name of station (VAR) (VOR: Declination)	ID	FREQ (CH)	Hours of operations	Coordinates	ELEV DME antenna (ft)	FRA relevance	Remarks
1	2	3	4	5	6	7	8
AALBORG VOR (1°E 2008)	AAL	116.700MHZ	H24	570613N 0095944E		(I)	DOC FL 500/100 NM
KORSA VOR/DME (1°E 2008)	KOR	112.800MHZ CH75Y	H24	552622N 0113754N	136.2	(A)	DOC FL 500/80NM STAR EKCH and EKRK



**Example 2:**

ENR 4.1 Radio navigation aids - en-route

Legend for FRA relevance: (E) = "Horizontal Entry point", (X) = "Horizontal Exit point", (I) = "Intermediate point", (A) = "Arrival Connecting point", (D) = "Departure Connection point".

**Option 1 – additional text in column (4) for FRA relevant information**

Name-code designator	Coordinates	ATS route or other route	Remarks/Usage
1	2	3	5
LIMAK	585036N 0272804E	N/A	FIR BDRY, <b>FRA (E)</b>
LOGNA	575035N 0213937E	M611, P31, Q33, Q141	FIR BDRY, <b>FRA (I)</b>
NEGVA	690920N 0144854E	N3	FIR BDRY, <b>FRA (EX)</b>

**Option 2 – additional column (4) for FRA relevant information**

Name-code designator	Coordinates	ATS route or other route	FRA relevance	Remarks/Usage
1	2	3	4	5
LIMAK	585036N 0272804E	N/A	(E)	FIR BDRY
LOGNA	575035N 0213937E	M611, P31, Q33, Q141	(I)	FIR BDRY
NEGVA	690920N 0144854E	N3	(EX)	FIR BDRY

In case the ENR 4.4 significant point is dedicated to FRA only and not part of a specific ATS route, the corresponding information in column 3 should state "N/A" (Not Applicable).

The States have to ensure the publication of the FRA relevance on significant points on all appropriate AIP charts (see section 6.5.3).

### 3.1.9 Airspace reservations in ENR 5

The following AIP sections are used for publication of information of Special Areas (SA):

- **ENR 1.9 Air Traffic Flow Management/Airspace Management** - to include general information on CDR and TSA/TRA.
- **ENR 5.1 Prohibited, Restricted and Danger Areas (P, R and D).**
- **ENR 5.2 Military Exercise and Training Areas and Air Defence Identification Zone (ADIZ)** shall be used for any "special use airspace" (CIV/MIL) including TSA/TRA specific information.

There is the potential for airspace reservations to be reconfigured to meet different task needs and this will require updates to ENR 5.1 and ENR 5.2.

AIP publication of 5LNC for Special Area for FRA purposes:

When airspace reservations are not available for crossing, 5LNC will be defined to facilitate flight planning clear of the airspace reservation and ensure sufficient separation from the activity. The publication of these 5LNC shall be ensured in ENR 4.4 and utilisation rules shall be described in the RAD.

If these points are to be used only for avoidance of airspace reservations, such flight planning limitations shall be clearly published in the RAD.

#### Notes:

1. *Publication of the Special Areas (SA) and their availability times should be made available, in addition to national AIP publications, to EUROCONTROL/NMD to ensure accurate information on their availability.*
2. *Information on airspace activations is published in AUP/UUP or by NOTAM (as a standard AIS procedure for AIS dynamic data publication, see ERNIP Part 3 - ASM Handbook) and handled through the Network Manager.*

## 3.2 FRA - Charts Publication

The chart types that can be affected by FRA implementation are En-route Charts and Aerodrome Charts as specified below.

### 3.2.1 ENR 6 En-route Charts

Two alternatives are available:

- To embed the relevant information into the existing En-route charts. In case FRA vertical limit coincides with the LOWER/UPPER limits, States may recognise no need to publish a separate chart.

Or

- If the FRA vertical limit does not coincide with the LOW/UPP limit - a new FRA dedicated En-route chart may need to be developed and published in the AIP as a new sub-section of ENR 6. EN-ROUTE CHARTS (ENR 6.x);
- This FRA chart will accompany the LOW/UPP En-route Chart(s).

If the cross-border FRA implementation is encompassing multiple states, a new FRA dedicated En-route chart may be published as a new sub-section of ENR 6. ENROUTE CHARTS (ENR 6.x)

- This chart will encompass the total FRA boundary (perimeter) of the involved States.
- The chart may exclude involved States FRA related significant points, to avoid clutter in the chart. For information on related significant points within, a reference to each individual States AIP is sufficient.

### 3.2.2 Aerodrome Charts (SID/STAR and Area Charts)

In the context of the FRA Concept, the access to/from terminal airspace needs to be considered and appropriate refinements to TMA structures initiated, including the definition of additional SIDs/STARs to permit more flexibility.



Updates and changes to Aerodrome Charts (ref. Annex 15 Appendix 1, AD 2.24) may be needed if SIDs/STARs are extended, or for publishing connecting ATS routes. Therefore, FRA implementation may affect also the Area Chart - ICAO, if published by States.

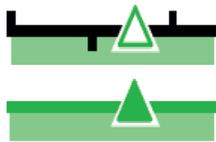
- Charts supporting FRA implementation in mountainous terrain - To be developed

### 3.2.3 FRA Chart symbols

The examples are available in the Example 1 below.

- FRA boundary in coincidence with FIR with on-request entry/exit point;
- Independent FRA boundary with compulsory entry/exit point.

**Example:**



*BUMAB*  
(EX)

The FRA relevance of a significant point shall be indicated by the following letters and published within brackets:

- (E), for "FRA Horizontal Entry Point";
- (X), for "FRA Horizontal Exit Point";
- (I), for "FRA Intermediate Point";
- (A), for "FRA Arrival Connecting Point";
- (D), for "FRA Departure Connecting Point".

Combinations of letters can be published, in accordance with the matrix provided in section AIP publication of FRA relevant points in ENR 4.1 and 4.4.

**Example:**

(EX) - Horizontal entry/exit point.

(XD) - Horizontal exit/departure connecting point.

Letter(s) in the charting symbol are not viable options as might be unreadable on the charts. Suggestion is made to add FRA related information in the label like in the example above.

Based on the best practice applied by EUROCONTROL ERC/ERN Charts and in cooperation with charting experts, green colour is suggested.

These proposals have been developed to comply with ICAO Annex 4, Appendix 2:

- Conformity with ICAO symbols 121 (Annex 4, Appendix 2-18); and green colour suggested for FRA related points;
- Conformity with ICAO airspace classifications 126 (Annex 4, Appendix 2-19); and green colour for FRA related boundary.

### 3.3 FRA - AIP Publication Template

<i>AIP</i> .....	<i>ENR 1.3-1</i> <i>27 NOV 03</i>
<b>ENR 1.3 INSTRUMENT FLIGHT RULES</b>	
<b>1. Rules applicable to all IFR flights</b> ...	
<b>2. Rules applicable to IFR flights within controlled airspace</b> ...	
<b>3. Rules applicable to IFR flights outside controlled airspace</b> ...	
<b>4. Free Route Airspace general procedures</b>	
<b><u>4.1 Area of application</u></b> e.g. "FRA procedures are available in Amwell FIR above FL245. If applicable specify airspace where provision of service is delegated to another ANSP. For further details see ENR 2.2. and ENR Charts."	
<b><u>4.2 Flight Procedures</u></b>	
<b><u>4.2.1 General</u></b> e.g. "Traffic will be subject to General Rules (ENR 1.1), RAD and Letters of Agreement (LoA) between neighbouring ACCs."  e.g. "Within FRA users will be able to plan user-preferred trajectories through the use of significant points included in AIP ... (State) ENR 4.4 Name-code designators for significant points and ENR 4.1 Radio navigation aids - en-route, respectively. Segments between significant points will be indicated by means of "DCT" instructions."  DCT usage / limitations e.g. "Within the FRA area there will be no limitations on the use of "DCT".	
<b><u>4.2.2 Overflying traffic</u></b> e.g. "Overflying traffic should plan directly from Amwell FIR entry point to the Amwell FIR exit point."	
<b><u>4.2.3 Access to/from Terminal Airspace</u></b> e.g. "Arriving traffic should plan directly from Amwell FIR entry point to the FRA Arrival Connecting Point (A) / STAR initial waypoint."  e.g. "Departing traffic should plan directly from FRA Departure Connecting Point (D) / SID final point to the Amwell FIR exit point."  <i>Flight planning within the FRA area will comply with adjacent ATS route network orientation.</i>  e.g. "For southbound traffic via NELSO connecting to UN741, ODD and EVEN levels are available 50NM prior arriving NELSO waypoint."	
<b><u>4.2.4 Cross-Border Application</u></b>  Cross-border - DCT - (NOT) allowed. Describe the exception of the segments as applicable.  e.g. "Airspace users will have to plan their trajectory inside FRA in Amwell FIR through the use of the intermediate significant points."	
(Amendment Number)	(Name of Publishing Authority)

e.g. "Intermediate waypoint NARTA suggested for traffic passing through Denham FIR / UIR."

e.g. "Exceptional cross-border DCT segments allowed are:

RALUS DCT ALAGU  
RALUS DCT AMSEL  
BABEX DCT ALAGU  
BABEX DCT AMSEL  
BABEX DCT OSLAD"

#### **4.3 Airspace Reservation - Special Areas**

##### **4.3.1 Re-routing Special Areas**

e.g. "AOs will plan their trajectory inside FRA disregarding all segregated airspace. In case there is no availability to cross segregated areas, "

or

e.g. "AOs will plan their trajectory around segregated airspace, when not available for civil operations, by using the 5LNC published for this purpose in ENR 4.4."

##### **4.3.2. Promulgation of route extension**

e.g. "In case there is no availability to cross the segregated area, it is expected that the average flight extension to be considered by aircraft operators is approximately 5NM; in exceptional occasions 15NM. However, in most of the cases radar vectors shall be provided by ATC."

#### **4.4 Additional FRA Procedures**

e.g. "For speed and level changes inside FRA in Amwell FIR on flight plan Item 15, additionally to a significant point and only for this purpose, aircraft operators may also use geographical coordinates."

e.g. "In terms of flight planning, Item 15, flight levels (FLs) within Amwell FIR FRA area will respect the table of cruising levels included in ENR 1.7, with the exception of waypoint RIVRO. By Letter of Agreement, traffic intending to enter Amwell FIR via RIVRO must enter at ODD FLs and traffic intending to exit Amwell FIR via RIVRO must exit at EVEN FLs."

#### **4.5 Route Availability Document (if required)**

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(Amendment Number)

(Name of Publishing Authority)

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**ENR 2.2 OTHER REGULATED AIRSPACE**

**1. General**

...

**2. The area involved in the transfer of ATS responsibility**

...

**3. Contingency planning in Broxby ACC (conflict free allocation scheme)**

**3.1 General**

The ..... (State) Air Traffic Services Contingency Planning is based on strict operating criteria. Its method, structure and applicability are universal and based on the consequences of technical or catastrophic failure that may occur in the Air Navigation System. It contains material dealing with planning for TMAs and En-Route contingencies.

Whenever a contingency occurs, the Network Manager and ..... ACCs will be informed accordingly.

The Conflict Free FL allocation Scheme structure will apply to all Scenarios.

**3.2 Types of Contingency**

**3.2.1 Scenarios for Contingency and Capacities:**

Scenario 1:

...

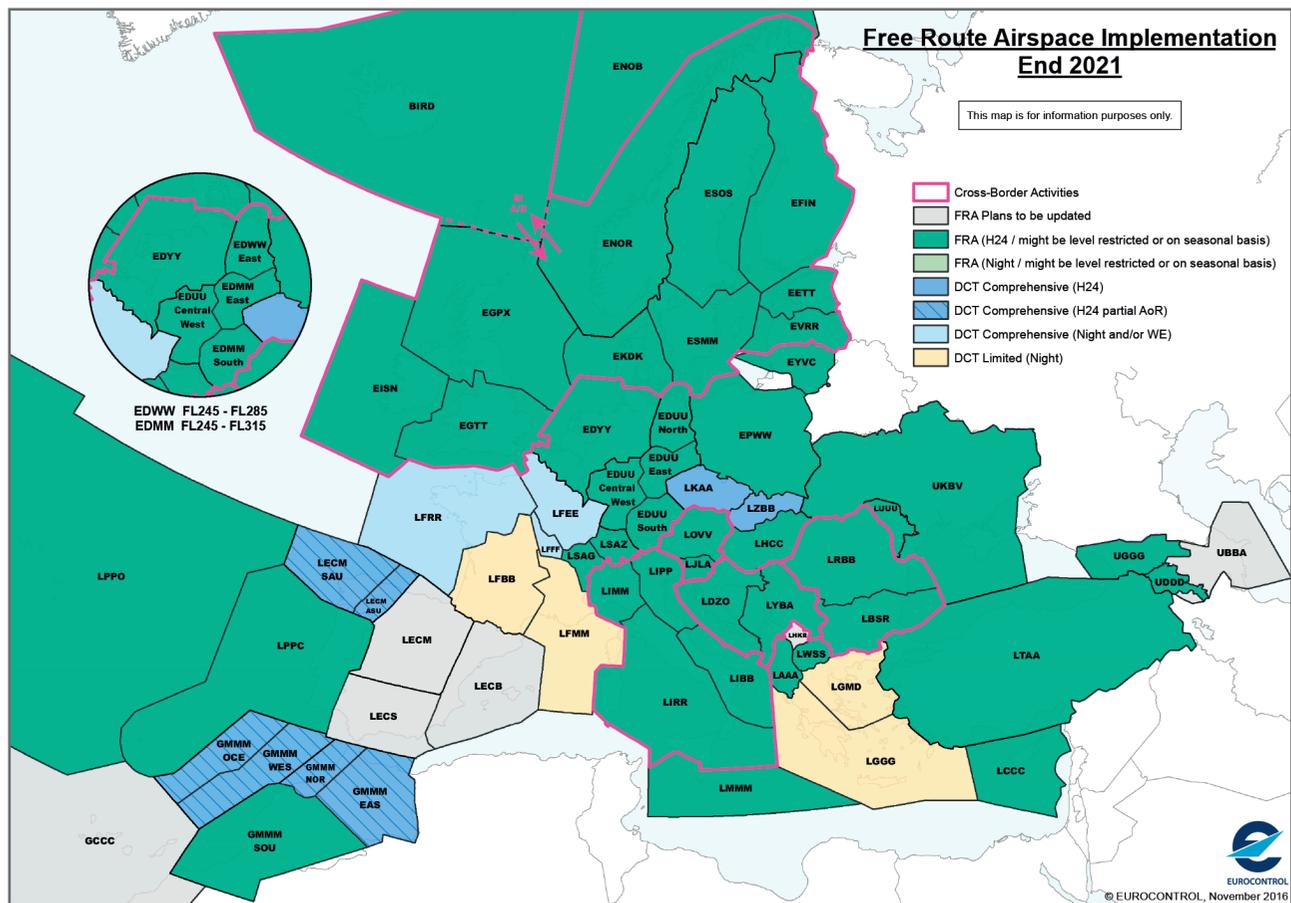
Scenario 2:

...



## 4.2 FRA in 2021

The status of FRA Implementation in 2021 is depicted in the following map.



## 4.3 FRA Check List of Implementation Actions

The status of FRA Implementation in 2021 is depicted in the following map.

### STEP 1

Operational validation with NM (Operations Planning and Network Operations) should start at least 5 AIRAC cycles prior to the implementation date. The States/FABs/ANSPs shall include in the validation, inter alia:

- Airspace organisation;
- Procedures;
- Restrictions (Pan-European Annex and Appendices - Including city pair level capping, En-route and Airfield DCT limits, Flight Profile Restrictions);
- Flight planning aspects;
- Description of military airspace and civil/military procedures.

### STEP 2

Include neighbours in the operational validation, at least 5 AIRAC cycles prior to the implementation date. The States/FABs/ANSPs shall include in the validation, inter alia:

- Airspace organisation - transfer points;
- Procedures - Letters of agreement;
- Restrictions (Pan-European and Appendices - Including city pair level capping, En-route and Airfield DCT limits, Flight Profile Restrictions);
- Flight planning aspects;
- Description of military airspace and civil/military procedures at interfaces.

### STEP 3

For the purpose of the validation with NM (Operations Planning and Network Operations) and neighbours, it is desirable that AIS publications are already available and include information on:

#### **Characteristics of a FRA published in AIP (eventually promulgated by AIC)**

- **Lateral Limits:** have to be the ones of an ATC Unit Airspace (AUA) (CTA, TMA ...) or a group of them;
- **Vertical Limits:** can be implicit (FRA is available at all levels within the AUA) or a subset of them (Vertical band);
- **FRA Entry/Exit Points;**
- **FRA Departure/Arrival Connecting points (if any);**
- **FRA Intermediate Points:** either **none allowed**, or **all allowed**, or **only via specific points**;
- **Applicable time:** not necessarily H24.

(These characteristics and definitions are implemented in CACD via the Restrictions model. A new type of DCT restriction is created - FRA DCT Restriction)

- **Military airspace:** Description of military areas and of the procedures to be followed in case of active/non-active areas.

Ensure that NM has all the information and that this information continues to be delivered post implementation.

### STEP 4

Following validation of all data, there might be a need to change some of the publication data and information. Such changes should be operated in such a way that the final AIS publication is made at least 2 AIRAC cycles prior to implementation. The publication should be made by using to the largest possible extent the templates developed as part of the RNDSG. **Publicity towards AOs must be also ensured.**

## 5. GLOSSARY OF TERMS

- **Aeronautical data** (ICAO Annex 15 Aeronautical Information Services)  
A representation of aeronautical facts, concepts or instructions in a formalized manner suitable for communication, interpretation or processing.
- **Aeronautical information** (ICAO Annex 15 Aeronautical Information Services)  
Information resulting from the assembly, analysis and formatting of aeronautical data.
- **Aeronautical Information Publication (AIP)** (ICAO Annex 15 Aeronautical Information Services)  
A publication issued by or with the authority of a State and containing aeronautical information of a lasting character essential to air navigation.
- **Area navigation route** (ICAO Annex 11, Doc 4444 - ATM (PANS-ATM))  
An ATS route established for the use of aircraft capable of employing area navigation.
- **ATS route** (ICAO Annex 2, Annex 11, Doc 4444 - ATM (PANS-ATM))  
A specified route designed for channelling the flow of traffic as necessary for the provision of air traffic services.

### Notes:

1. The term "ATS route" is used to mean variously, airway, advisory route, controlled or uncontrolled route, arrival or departure route, etc.
2. An ATS route is defined by route specifications which include an ATS route designator, the track to or from significant points (waypoints), distance between significant points, reporting requirements and, as determined by the appropriate ATS authority, the lowest safe altitude.

- **DCT** (Doc 8400, ICAO Abbreviations and Codes (PANS-ABC))  
Direct (in relation to flight plan clearances and type of approach)  
Decoded abbreviation/indicator DCT (Direct) or Encoded abbreviation/indicator Direct (DCT) should be used only:
  - for flight planning purposes when submitting FPL;
  - when executing specified type of approach.
- **Free Route Airspace (FRA)**  
A specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) way points, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.
- **FRA Arrival Connecting Point (A)**  
A published Significant Point to which FRA operations are allowed for arriving traffic to specific aerodromes. The FRA relevance of such points shall be included in ENR 4.1/4.4 columns as (A). Indications on their use for arrivals to specific aerodromes shall be notified via the RAD.
- **FRA Departure Connecting Point (D)**  
A published Significant Point from which FRA operations are allowed for departing traffic from specific aerodromes. The FRA relevance of such points shall be included in ENR 4.1/4.4 columns as (D). Indications on their use for departures from specific aerodromes shall be notified via the RAD.



#### ■ **FRA Horizontal Entry Point (E)**

A published Significant Point on the horizontal boundary of the Free Route Airspace from which FRA operations are allowed. The FRA relevance of such points shall be included in ENR 4.1/4.4 columns as (E). If this point has specific conditions of utilization, this shall be described in the RAD.

#### ■ **FRA Horizontal Exit Point (X)**

A published Significant Point on the horizontal boundary of the Free Route Airspace to which FRA operations are allowed. The FRA relevance of such points shall be included in ENR 4.1/4.4 columns as (X). If this point has specific conditions of utilization, this shall be described in the RAD.

#### ■ **FRA Intermediate Point (I)**

A published Significant Point or unpublished point, defined by geographical coordinates or by bearing and distance via which FRA operations are allowed. If published, the FRA relevance of such points shall be included in ENR 4.1/4.4 columns as (I). If this point has specific conditions of utilization, this shall be described in the RAD.

#### ■ **Route Availability Document (RAD)**

A common reference document containing the policies, procedures and description for route and traffic orientation. It also includes route network and free route airspace utilisation rules and availability.

#### ■ **Significant Point (ICAO Annex 11 Air Traffic Services)**

A specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigational and ATS purposes.

*Note: There are three categories of significant points: ground-based navigation aid, intersection and waypoint. In the context of this definition, intersection is a significant point expressed as radials, bearings and/or distances from ground based navigation aids.*

#### ■ **Special areas (SA)**

“Airspace reservation” refers to airspace of defined dimensions for the exclusive use of specific users. These are special designed areas within which both civil and military activities could take place, including CBA, TRA, TSA, D, R, P and any specially activated areas.

#### ■ **Way Point (ICAO Annex 11 Air Traffic Services)**

A specified geographical location used to define an area navigation route or the flight path of an aircraft employing area navigation. Waypoints are identified as either:

- Fly-by waypoint (ICAO Doc 8168 VOL 2) A waypoint which requires turn anticipation to allow tangential interception of the next segment of a route or procedure, or
- Flyover waypoint (ICAO Doc 8168 VOL 2) A waypoint at which a turn is initiated in order to join the next segment of a route or procedure.









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