



**Network Manager**  
nominated by  
the European Commission



# European Route Network Improvement Plan

## Framework Document

European Network Operations Plan 2015 - 2019

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(ERNIP)  
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<p>This deliverable contains the Framework Document of the European Route Network Improvement Plan (ERNIP). It is in response to 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).</p> <p>It contains the general description of the European Route Network Plan and of its 4 parts:</p> <p><b>PART 1</b> - The European Airspace Design Methodology Guidelines – General Principles and Technical Specification for Airspace Design</p> <p><b>PART 2</b> – ATS Route Network Version 8 – Catalogue of Airspace Projects 2012-2014</p> <p><b>PART 3</b> – ASM Guidance Material – ASM Handbook</p> <p><b>PART 4</b> – Route Availability Document User Manual</p>		
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# 1 Introduction



## 1.1 Context

### 1.1.1 About the document

The Framework Document describes the structure of the European Route Network Improvement Plan.

### 1.1.2 European Regulation

The present document addresses the requirements expressed in the EC Regulation No. 677/2011 Annex I.

The EC Regulation No 677/2011 of 7 July 2011 lays down detailed rules for the implementation of air traffic management (ATM) network functions and amends Regulation (EU) No 691/2010. The regulation establishes several ATM network functions to be performed by a Network Manager<sup>1</sup>; EUROCONTROL has been nominated as the Network Manager entrusted to perform these network functions.

The EC Regulation No 677/2011 lists in Chapter II Article 3 paragraph 4, the ATM network functions to be performed by the Network Manager; amongst them, the design of the European Route Network is identified ( para (a) refers).

The design of the European Route Network, as described in Annex 1 of EC Regulation No 677/2011 calls for the establishment of the European Route Network Improvement Plan. The Network Manager will have to develop, through a cooperative decision making process, the *European Route Network Improvement Plan*. The *European Route Network Improvement Plan* is be part of the *Network Operations Plan*. The Network Operations Plan (for 3-5 years and the annual one), including the European Route Network Improvement Plan will be approved once per year by the governance structure of the Network Manager.

### 1.1.3 Content

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) includes in Annex I the description of the the European Route Network Design (ERND) Function and defines the content of the European Route Network Improvement Plan.

The content of the European Route Network Improvement Plan is described in the NM IR as follows:

- (a) common general principles complemented by technical specifications for airspace design;*
- (b) military airspace requirements;*
- (c) an agreed European route network and, where feasible, free route airspace structure designed to meet all user requirements with details covering all the airspace change projects;*
- (d) route network and free route airspace utilisation rules and availability;*
- (e) indications on recommended ATC sectorisation and sector families in support of the ATS airspace structure to be designed, decided and implemented by the Member States;*

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<sup>1</sup> For full reference the reader is invited to consult the Official Journal of the European Union L185/1 from 7 July 2011

- (f) guidelines for airspace management;*
- (g) a defined development timetable;*
- (h) the calendar for a common publication and implementation cycle, through the Network Operations Plan; and*
- (i) an overview of the current and expected network situation, including expected performance based on current and agreed plans.*

#### **1.1.4 Objective**

In response to 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 objective of this document is to provide a description of the objectives and structure of the European Route Network Improvement Plan.

#### **1.1.5 Geographical Scope**

The European Route Network Improvement Plan covers all EU, EUROCONTROL and ECAC Member States. In order to ensure regional interconnectivity and interoperability of the European route network within the ICAO EUR Region and with adjacent Regions, the European Route Network Improvement Plan also includes States at those interfaces.

#### **1.1.6 Cooperative Decision Making Process and Detailed Working Arrangements**

The Cooperative Decision Making Process for the European Route Network Improvement Plan was approved by the Network Management Board.

The detailed Network Manager working arrangements supporting the development of the European Route Network Improvement Plan are:

- The Network Operations Team and its following sub-structures:
  - The Route Network Development Sub-Group
  - The Airspace Management Sub-Group
  - The ATM Procedures Sub-Group
  - The ATFCM Operations and Development Sub-Group
  - The Navigation Sub-Group.

The Network Manager is also using other ad-hoc expert groups or the Functional Airspace Blocks working arrangements for the development of the European Route Network Improvement Plan.

## 1.2 Relationship with ICAO

All aspects included in the European Route Network Improvement Plan that refer to regional interconnectivity and interoperability of the European route network within the ICAO EUR Region and with adjacent Regions are constantly discussed with ICAO.

Appropriate cooperation is ensured between the Network Manager and its detailed working arrangements supporting the development of the European Route network Improvement Plan and the relevant ICAO expert level working arrangements covering route network improvements at the interface.

The Network Manager and the Member States will develop, through the cooperative decision making process common proposals for amendments of the appropriate ICAO documents. In particular, for amendments of ICAO documents related to ATS routes or Free Route Airspace over the High Seas, Members States shall apply the applicable ICAO coordination procedures.

The following **principles** were agreed between the ICAO and the Network Manager with respect to the update of the ICA EUR ANP:

- Ensure a timely update of the ICAO EUR ANP;
- Maintain the current dynamic process of route network development and implementation as set up in the context of the RND SG;
- Avoid duplication of work for States/ANSPs located in the ECAC area;
- Ensure clarity for the ICAO ANP for the EUR Region on route network status;
- Make the best use of existing resources.

The following process was agreed for the update of the ICAO EUR ANP:

**For ATS routes having their full alignment in the ECAC airspace**

- Once a new route was co-ordinated through the RND SG process and agreement was reached on its implementation, the route is entered into the ICAO EUR ANP via the web-based tool by the RND SG Secretariat.

**For ATS routes having their alignment just partially in the ECAC airspace**

- Once a new route was co-ordinated through the RND SG process and agreement was reached on its implementation for the portion in the ECAC airspace, the route is fully entered into the ICAO EUR ANP via the web-based tool by the RND SG Secretariat. The need for co-ordination with adjacent non-ECAC airspace is triggered through the tool.

For routes located fully in the ECAC area, the data will be directly migrated to the ICAO ANP and other output documents as co-ordination already took place through the RND SG. For the portion of routes located outside the ECAC area, the data will be migrated to the ICAO ANP and other output documents after the completion of the coordination process.

This pragmatic approach responds to the clear need of keeping up-to-date the ICAO Regional and Global Air Navigation Plans while maintaining the dynamic process for route network development and implementation that is currently conducted through the Network Manager.

The material contained in the various parts of the European Route Network Improvement Plan should be used in conjunction with the provisions specified in ICAO. For any other detailed technical aspects related to airspace design reference is to be made to appropriate ICAO documentation.

## **2 Strategic Objectives**

## 2.1 Strategic Objectives

The European Route Network Improvement Plan responds to the following Strategic Objectives of the Network Strategy Plan:

- **Strategic Objective (SO 1)**
  - **Effective (robust) network CDM process offering the strongest possible level of acceptance of network measures**
- **Strategic Objective (SO 2)**
  - **Make available and share information and data relevant to network management and operations**
- **Strategic Objective (SO 3)**
  - **Network Manager Performance plan to enhance the performance of the network.**
- **Strategic Objective (SO 4)**
  - **Development and adoption of the NOP to achieve the Network performance targets resulting from the RP1 EU regulatory process**
- **Strategic Objective (SO 5)**
  - **Manage the effectiveness of the network through monitoring and cooperative work to deliver the required network performance**
- **Strategic Objective (SO 6)**
  - **Integrate the airport operations into the network operations**
- **Strategic Objective (SO 7)**
  - **Ensure a safety-based approach to the network operations**
- **Strategic Objective (SO 8)**
  - **Manage scarce resources and address limited resources to achieve the required performance**
- **Strategic Objective (SO 9)**
  - **Address limitations of Human ATM resources to achieve the required performance**
- **Strategic Objective (SO 10)**
  - **Prepare the network management and the network operations for RP2**

## 2.2 Performance Targets

The operational targets and objectives will be applied from the strategic phase through to the tactical phase.

The Performance Scheme for air navigation services and network functions, adopted in the context of the Single European Sky II Regulations, includes two important key performance areas and associated indicators, related to the operational performance of the European ATM network for the period 2012-2014. Similar key performance areas, indicators and targets have been adopted by the EUROCONTROL Provisional Council.

- **Environment**

- **average horizontal en-route flight efficiency**, defined as follows:
  - the average horizontal en-route flight efficiency indicator is the difference between the length of the en-route part of the trajectory and the optimum trajectory which, in average, is the great circle
  - “en-route” is defined as the distance flown outside a circle of 40 NM around the airport
  - the flights considered for the purpose of this indicator are:
    - all commercial IFR flights within European airspace;
    - where a flight departs or arrives outside the European airspace, only that part inside the European airspace is considered;
    - circular flights and flights with a great circle distance shorter than 80NM between terminal areas are excluded.
- **effective use of the civil/military airspace structures, e.g. CDRs** (Conditional Routes). For the first reference period, this indicator shall be only monitored.

- **Capacity**

- **minutes of en-route ATFM** delay per flight, calculated for the full year and including all IFR flights within European airspace.

For the performance reference period starting on 1<sup>st</sup> January 2012 and ending on 31<sup>st</sup> December 2014, the European Union-wide and EUROCONTROL performance targets will be as follows:

- **Environment target:** an improvement by 0,75% point of the average horizontal en-route flight efficiency indicator in 2014 as compared to the situation in 2009.
- **Capacity target:** an improvement of the average en route Air Traffic Flow Management (ATFM) delay so as to reach a maximum of 0,5 minute per flight in 2014.

## 3 Structure

### 3.1 General Description

The content of the European Route Network Improvement Plan is wide. In order to bring clarity and flexibility to the large amount of subjects that need to be covered, a flexible and modular structure of the deliverable was agreed that responds to the regulatory requirements and that keeps the required flexibility to respond to its operational nature.

In order to respond to that the European Route Network Plan is organised in 4 Parts:

- **PART 1**                      **European Airspace Design Methodology Guidelines**  
                                      **- General Principles and Technical Specifications for**  
                                      **Airspace Design**
  
- **PART 2**                      **ATS Route Network Version 8 - Catalogue of Airspace**  
                                      **Projects 2012-2014**  
  
                                      **RNDSG synopsis, AIRAC Implementation Summaries**  
  
                                      **Ad-hoc Implementation Summaries**
  
- **PART 3**                      **Airspace Management Handbook - ASM Guidance Material**
  
- **PART 4**                      **Route Availability Document (RAD)**  
                                      **-RAD User Manual**  
                                      **-Operational RAD**

#### 3.1.1 PART 1 – European Airspace Design Methodology Guidelines

The Part 1 – European Airspace Design Methodology Guidelines – General Principles and Technical Specifications For Airspace Design responds to the following requirement for the content of the European Route Network Improvement Plan:

*(a) common general principles complemented by technical specifications for airspace design;*

This part contains general principles, detailed technical specifications and methods of application for a common airspace design and change process in Europe.

The guidelines contained in this document have been developed to support the European airspace design process in that overall performance is improved and airspace structures are developed in a harmonised manner. The document will be reviewed periodically so it remains valid in light of the progress made and experience gained, and to reflect the actual changes that take place in aviation.

The European Airspace Design Methodology is mainly focused on providing general guidance and technical specifications for airspace designers.

It is structured in an amendable format. Such a format will allow ad-hoc amendments that will not require the re-approval of the entire document.

#### 3.1.2 PART 2 – ATS Route Network Version 8

The Part 2 – ATS Route Network Version 8 – Catalogue of Airspace Projects 2012-2014 responds to the following requirements for the content of the European Route Network Improvement Plan:



*(b) military airspace requirements;*

*(c) an agreed European route network and, where feasible, free route airspace structure designed to meet all user requirements with details covering all the airspace change projects;*

*(e) indications on recommended ATC sectorisation and sector families in support of the ATS airspace structure to be designed, decided and implemented by the Member States;*

*(g) a defined development timetable;*

*(h) the calendar for a common publication and implementation cycle, through the Network Operations Plan; and*

*(i) an overview of the current and expected network situation, including expected performance based on current and agreed plans.*

The objective of the ARN Version-8 part of the European Route Network Improvement Plan is the enhancement of European ATM capacity, flight efficiency and environmental performance through the development and implementation of an improved ATS route network, Free Route Airspace and TMA systems structures supported by corresponding improvements to the airspace structure and the optimal utilisation rules of both. It contains:

- An overview of the consolidated European approach to airspace design
- An overview of ARN Version-8 benefits
- A description of the Airspace Action Plan and depicts its implementation
- A consolidated Concept of Operations
- A description of the Network Collaborative Decision Making Process
- An assessment of the demand between 2007/2008 and 2010/2011
- A description of the ARN Version-8 layers
- An assessment and analysis of ARN Version-8 projects
- A detailed list of ARN Version-8 airspace projects.

The ARN Version-8 also ensures the regional interconnectivity and interoperability of the European route network within the ICAO EUR Region and with adjacent ICAO Regions.

### **3.1.3 PART 3 – Airspace Management Handbook – ASM Guidance Material**

The Part 3 – Airspace Management Handbook – ASM Guidance Material responds to the following requirement for the content of the European Route Network Improvement Plan:

*(f) guidelines for airspace management;*

The Airspace Management Handbook for the Application of the Concept of the Flexible Use of Airspace specifies the general Airspace Management (ASM) functions and Air Traffic Management (ATM) procedures needed to apply and fully exploit the Concept of the Flexible Use of Airspace.

No changes were made to the previous ASM Handbook, except the regular amendments. In this respect, due attention was paid to the regulatory requirements, as the ASM Guidance Material is already referred to in various SES documents.

### 3.1.4 PART 4 – Route Availability Document

The Part 4 – Route Availability Document responds to the following requirement for the content of the European Route Network Improvement Plan:

*(d) route network and free route airspace utilisation rules and availability;*

The Route Availability Document is a component of the European Route Network Improvement Plan. Actions to modernise the RAD have already been initiated and they will cover all aspects of the RAD starting from the content of various Annexes and Appendixes to processes for maintaining and updating the RAD.

The General Description of the RAD is contained in the Section 8 of the Part 1 of the European Route Network Improvement Plan.

As the European Route Network Improvement Plan is orientated towards the operational stakeholder, the RAD User Manual has become part of the European Route Network Improvement Plan. The need to establish improved links between the processes of Airspace Design and Airspace Utilisation in coordination with the Operational Stakeholders is one of the top priorities for the Network Manager. To fulfil this requirement a multidisciplinary team had been established in support of Operational Stakeholders dealing with all aspects of the Route Availability Document (RAD) from policy to implementation and review, namely the “RAD Team”. The RAD User Manual details the roles and responsibilities of the RAD Team as well as the relationships with all other responsible bodies involved in the entire RAD process.



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