NM Flight Planning Requirements

Guidelines

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1 General Provisions

(1) This document outlines the necessary steps needed to be taken in order to ensure the required level of compatibility with NM systems for flight planning procedures. These provisions cover the most significant aspects that shall be known by the NM Operational Stakeholders in support to flight planning.

(2) The Document contains provisions and requirements supplementary to those described in the ERNIP Part 1, Part 3 and Part 4, IFPS User Manual, Airspace Data Operations Manual, FUA AMC CADF Operations Manual, Guidelines on NMOC FRA Operational Validation and NMOC FRA system processing.

(3) Any new abbreviations, terms or definitions appearing in this Document different from ICAO are used only and exclusively by the Network Manager for the purposes described. All examples given in this Document shall be considered as fictitious.

(4) The Document is a property of the Network Manager.

1.1 Flight plans terminology

(5) To reflect the implementation of Flight and Flow In a Collaborative Environment (FF-ICE), some text in this document is 'generalised' to encompass all the different formats.

(6) The list below reflects the most common terminology and aims at guiding users of the manual on the logic applied to integrate all new terms.

a) When the term FPL is used, it relates to a flight plan in ICAO FPL2012 format.

b) When the term IFPL is used, it relates to a flight plan in ADEXP format.

c) When the term eFPL is used, it relates to an FF-ICE flight plan in FIXM format.

d) When the term 'flight plan' is used, otherwise specified, relates to all formats.

(7) An associated message is a subsequent message to a filed flight plan that aims to associate to the former in order to provide an update. When the term 'associated message' is used, otherwise specified, relates to all formats.

(8) A 'modification message' relates to all format:

a) In the FPL related cases, it is done with a CHG message.

b) In the IFPL related cases, it is done via an ICHG message.

c) In the eFPL related cases, it is done via a Flight Plan Update message.

(9) Same logic applies to a 'delay message' with respectively a DLA or IDLA or Flight Plan Update message.

(10) As FPLs and IFPLs are close (considering the amount and the granularity of the data they carry), when the sentence 'in the FPL related cases' is used, it relates to both unless specified otherwise.

(11) The term 'feedback' describes the reply from IFPS to any message submission. In the FPL related cases, the feedback is in the form of an ORM.

(12) In the eFPL related cases, the feedback in the form of a submission response from NM B2B and in the form of an ORM.

(13) For example, the term 'ACK feedback' means ACK via an ORM and/or an ACK via a Submission Response.

(14) As far as flight plans and associated messages content and format are concerned, this document is based on the ICAO FPL2012 and the FIXM format is not covered. As a result, the following statement shall apply:

Although the terminology refers to ICAO FPL2012 format, it also includes all other formats (ADEXP/FIXM), and the equivalences shall be considered accordingly.

(15) In the majority of cases, the checks and processing performed by IFPS are identical whether a message is submitted in ICAO FPL2012, ADEXP or FIXM *format (differences are highlighted)*.

2 Network Airspace Characteristics

2.1 Purpose

(1) The purpose of this Chapter is to describe the expression in NM systems of the main network airspace elements used for flight plan processing.

(2) This Chapter covers the following network airspace elements their characteristics, available features and definitions:

- Significant Points;
- Aerodrome / Airport;
- Route - en-route and terminal;
- Airspace Volumes;
- FL orientation scheme.

2.2 Significant Point

2.2.1 Definitions

(1) Significant point is a specified geographical location used in defining an ATS route or the flight path of an aircraft and for other navigation and ATS purposes. 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.

(2) Significant point is defined as point in space. The geographic position is defined by geographical coordinates.

(3) A significant point may be projected from the earth's surface to unlimited level by drawing a perpendicular line to and extending from the earth's surface at the defined coordinate.

(4) A significant point has no vertical limit. Within the following environments relevant definition of vertical limit expression is used:

- ATS route network

  A significant point's vertical limits for trajectory planning are implicitly defined by the route segments that uses that particular significant point.

  Example: A significant point is part of an ATS route in the upper airspace (vertical limits FL245 - FL660). Due to the vertical limits of the ATS route, the trajectory can use this significant point only within these vertical limits of the ATS route.

- Free Route Airspace

  A significant point's vertical limits for trajectory planning are implicitly defined by the FRA area definition and depend on FRA significant point relevance.

  Example: A significant point is part of FRA area definition (vertical limits FL175 - FL660). Due to the vertical limits of the FRA area, the trajectory can use this significant point only within these vertical limits within the FRA area.

(5) The term "published significant point" refers to a significant point that is defined in AIP.

(6) The term “unpublished point” refers to a significant point that is not in AIP and expressed by geographical coordinates or by bearing and distance.

(7) Beside the geographical coordinates of the significant point, the State AIP publication contains more information on this significant point (e.g. name-code designator, type of significant point, in case of waypoint its type, geographical coordinates of the position, etc.).

2.2.2 NM System expression

(1) The significant point in NM system is a basic element in flight plan Processing.

(2) The significant point in NM system is linked to the National Airspace (NAS).

(3) The significant point in NM system is a point used in flight plan or associated message. Based on definitions this point can be:

- The Published Point type comprises all the Points that are published as separate lists of points in the AIP (e.g. in AD, ENR 4);
- The Unpublished Points are mainly points that are not published as separate lists of points in the AIP but are allowed in flight plans and associated messages. They can be used in flight plan route description (i.e. ICAO FPL2012 ITEM15) without previously being created in the database, as long as their Identifier is syntactically correct. Not every State allows utilisation of unpublished points. For more detail, see State AIP.

(4) The main Significant Point Types in NM system are as follows:

- Waypoint (PWP):
  - It is a “published significant point” type which includes all published 5 LNCs - designators of significant points not marked by the site of a radio navigation aid;

    Note: NM system also supports en-route waypoint defined by five alphanumeric name-code. This waypoint shall not be mixed with terminal point (TER).
- Navigation Aid (NVA):
  - It is a “published significant point” type which includes all published NAVAIDs - 2 or 3 LNCs - designators of significant points marked by the site of a radio navigation aid.
  - Each navigation aid significant point is defined with the technical type of the navigation aid (e.g. VOR/DME).
  - The type NVA is divided in 14 sub-types (DME, VOR, VOR-DME, VORTAC, ILS, MLS, ILS-DME, LOC, LOC-DME, NDB-MKR, MKR, NDB, NDB-DME, TACAN).
- Coord point (COR):
  - It is an “unpublished point” type where a significant point is only defined by its geographical coordinates.
  - Coord points are generally created in NM system to be used in other entities (e.g. in Routes).
  - Coord Point does not require to be defined in the CACD to be recognised by IFPS in flight plans.
  - Examples: 30N025W or 3930N01500W.

- Geographical coordinates in flight plans shall consist of either 2 degrees latitude followed by 3 degrees longitude, or 2 degrees and 2 minutes latitude followed by 3 degrees and 2 minutes longitude or by 2 degrees, 2 minutes and 2 seconds latitude followed by 3 degrees, 2 minutes and 2 seconds longitude.

  Examples
  46N078W
  4620N05805W
  462013N0580503W

- The IFPS will automatically accept those coordinates where one digit is missing, and will add a 0 (zero) to the front of the incomplete coordinate, provided that the first digit present is not a 0 (zero).

  Examples

4N40W and 04N40W	*accepted as 04N040W*
4N04W and 04N04W	*rejected*
400N40000W and 0400N4000W	*accepted as 0400N04000W*
400N0400W and 0400N0400W	*rejected*

- Reference Point (RFP) (intersection):
  - It is an "unpublished point" type where a significant point is defined by reference to an existing Navigation Aid.
  - Reference Points are generally created in NM system to be used in other entities (e.g. in Terminal Procedures).
  - Reference Point does not require to be defined in the CACD to be recognised by IFPS in flight plans.
  - In order to calculate the geographical position of a Reference Point in reference to a directional Navigation Aid, the NM system needs to convert this magnetic bearing into a true bearing. Therefore, any change of the Magnetic variation in the region where the Navigation Aid is located will affect the true bearing which is used to calculate the geographical position of the Reference Point, and thus it will affect the geographical position of the Reference Point itself. For that reason together with Navigation Aid, magnetic variation characteristic of its geographical position is also defined.

    Example: "BUB284007" which means 'magnetic bearing 284º of BUB, at a distance of 7 NM.
- Terminal Point (TER):
  - In majority of cases, it is a "published significant point" type where a significant point defines a certain Terminal Procedures, in particular PBN Terminal Procedures.
  - Includes all published five alphanumeric name-codes (5ANNCs) used for terminal/aerodrome PBN SID/STAR purposes.
  - It might be also an "unpublished point" for which a Runway Direction of an Aerodrome is taken as reference.
  - Terminal Points are used only in the published definition of certain Terminal Procedures.

    *Examples: Terminal Point for ENGM with sequence number 501 is assigned the Identifier: "GM501" or Terminal Point - *2FFM*

2.2.3 Set of points

(1) A Set of Points (PointSet - PS) is a collection of limited (20) number of explicit points.

(2) A PS can be used in the restriction (AURA) as condition and can be used in Flow definition as a flow element.

(3) Grouping of points allows more efficient maintenance of data in the NM system.

(4) A PointSet id is composed of 5 to 12 Alphanumeric characters, starting with 'PS'.

(5) A PointSet live update is not possible.

2.2.4 Point Usage

(1) The Point Usage was conceived to have a common way of defining FRA Restrictions. Each point in a FRA airspace would be assigned a role being Entry or Exit or Intermediate or Departure or Arrival. Currently, the date and time conditions are not supported and the point usage driven FRA restriction generation can only be applied for H24 7/7 FRA operations. FRA Point Usage data will be used by NM system to automatically create FRA restrictions.

(2) Point Usage Role

Depending on the context, points might be attributed with following Point Usage Role

- FRA context:
  - FRA-E FRA Entry Point
  - FRA-X FRA Exit Point
  - FRA-I Intermediate Point
  - FRA-A FRA Arrival Point
  - FRA-D FRA Departure Point
- Non FRA context
  - VFR Point for VFR flights only
  - TER Point for Terminal usage only
  - OCE Oceanic Entry/Exit Point
  - OAT Point
  - LF Landfall

(3) Point Usage Role - related elements

- FRA-E and FRA-X have to refer to an Airspace Border. An airspace border is made of two adjacent airspaces. The border itself is the curtain like shape where the 2 airspace abut either laterally or vertically.
- FRA-I points have to refer to an Airspace
- FRA-A and FRA-D points have to refer to a combination of (FRA) Airspace and an AD or AZ.
- Points can have different roles combined for overlapping level bands and times.
- Points can have different roles at different level bands and at different times.

(4) Point Roles – FL band

Point roles shall be aligned with the airspace or airspace border they serve. A horizontal exit point shall cover the vertical border curtain. Eventually balcony effects can be incorporated in the FL band.

- Vertical FRA-E and FRA-X shall typically allow 5000 ft either side of the vertical border to create a kind of entry/exit cone.
- FRA-A and FRA-D points can have a FL band completely outside or partially outside or fully outside the FRA airspace. If the FRA airspace has a closed vertical border the FRA-A and FRA-D roles have to be combined with FRA-E and FRA-X though.

(5) FRA Point Usage - Flight Level Orientation Scheme (FLOS)

- The "FLOS" over relevant FRA significant point is an information that States may publish in AIPs
- FRA FLOS shall include the "Direction of cruising level" for relevant FRA point only
- Is B2B exportable
- No hard checks by IFPS – will be used for information only
- Is an optional feature

(6) FRA Point Usage - IFPS processing

- If a point is defined in CACD as a Terminal Point (TER), an error shall be raised if the point is used in the visible enroute portion of flight route.
- If a point is defined in CACD as a OAT Point, an error shall be reported if the point is used in the GAT part of the route (not including the point that the flight transitions from GAT-OAT or OAT-GAT).
- If a point is defined in CACD as a VFR Point, an error shall be reported if the point is used in the IFR part of the route (not including the point that the flight transitions from VFR-IFR or IFR-VFR).

2.3 Aerodrome / Airport

2.3.1 Definition

(1) Aerodromes are defined area on land or water (including any buildings, installations and equipment) intended to be used either wholly or in part for the arrival, departure and surface movement of aircraft. An airport is an aerodrome with extended facilities, mostly for commercial air transport.

(2) The departure aerodrome / airport is the first geographic location of a trajectory.

(3) The arrival aerodrome / airport is the last geographic location of a trajectory.

2.3.2 NM System expression

(1) Aerodromes in NM system are defined with NM designator:

- ICAO ID;
- IATA ID, if available;
- If both are blank, artificial 4-alphanumeric ID, which consists of:
  - A country/region code – 1 or 2 characters long;

- An alphanumeric 2 or 3 digits value is used.
  (E.g. EB01 for Belgian AD or K123 for US AD).

(2) Aerodrome types in NM system are:

- Aerodrome (AD);
- Aerodrome Heliport (AH);
- Heliport (HP);
- Landing surface (LS);
- OTHER.

(3) Other aerodrome properties are Aerodrome Name, Category, Control Type, Elevation, Aerodrome reference point, Type, and properties to specify if aerodrome is private, uncontrolled, abandoned or water.

(4) Additionally to all required aerodrome properties, the following are defined in NM system:

- Aerodrome Terminal Procedures Usage - defines the period of time during which the approach/departure flight plan (AP/DP FPL) inclusion parameters apply. For all Aerodromes that have Terminal Procedures, the usage is H24 for all validity periods.
- Capacities - defined as the maximum number of flights due to take-off from and/or land at the Aerodrome during a determined period (one hour).

(5) For each aerodrome runway properties are also defined in NM system as follows:

- Runway Direction
  It corresponds to the QFUs (magnetic bearing of the runway) as published in the AIP. A Runway Direction includes taxi time attributes. The two opposite directions of the same physical runway are considered as different Runway Directions (e.g. 08 / 26). Parallel runways are also regarded as different Runway Directions and distinguished by the "Relative Position" attribute.
  The Runway Direction is composed of:
  - Direction (01 - 36);
  - Relative Position (one of L-Left, R-Right, C-Centre, and other alphabetic characters e.g. T-Tarmac, G - Grass);
  - Default Runway at least one global or one Arrival/Departure (one of Arrival, Departure, Default, None). The default runway is used in the terminal procedure selection for the profile calculation in IFPS;
  - Runway Type: 'Runway' or 'Heli'.

- Standard (default) Taxi Time

  It is defined as the average elapsed time in minutes for a departing aircraft to taxi from the off-block position to the take-off position.

  The Standard Taxi Time is a unique value (between 0 and 40 min) of taxi time for an Aerodrome. This attribute is mandatory for Aerodromes where no Runway Direction may be defined and thus no Runway Usage attributes. It is a forbidden attribute for Aerodromes for which the taxi time attributes, shall be implemented in the Runway Usage attributes.

- Runway Usage

It is defined for each Runway Direction and includes the following attributes:

- Default Taxi Time - defined as the average elapsed time in minutes for a departing aircraft to taxi from the off-block position to the take-off position. It is used to calculate the take-off time based on the EOBT of the flight plan. The Default Taxi Time must be a value between 0 and 40 min (default value - 10 min).
- Default Insert Time - also known as TIS: The purpose of TIS is to ensure that a CTOT improvement cannot be sent at short notice as the aerodrome requires some time to introduce an aircraft in the departure sequence (clock time + TIS + taxi time). The Default Insert Time must be a value between 0 and 30 min (default value = 10 min.).
- Default Remove Time - also known as TRS: implemented to prevent last minute modifications to an EOBT or an issued CTOT. It allows the calculation of the time after which an OBT or issued CTOT is frozen. No Slot allocation message will be sent by ETFMS after OBT-TRS, and no improvement of CTOT will be sent by ETFMS after CTOT – TRS – Taxi Time. The Default Remove Time must be a value between 0 and 20 min (default value - 5 min.).
- Permanent Runway Taxi Times - for specific periods of time, the implementation of Runway Usage Attributes (Taxi Time, Insert Time, Remove Time) different from the Default values. For the time periods when they are defined, these Permanent values overrule the Default values.

NOTE: Default values will be used if others are not specified.

Example of calculations involving Runway Usage attributes:

Aerodrome EDDF, Runway Direction 25 (default) has the following Runway Usage attributes:

Default Taxi Time: 15
Default Insert Time: 10
Default Remove Time: 20

Flight XYZ1234 departing EDDF has a CTOT of 13:00.

Any better CTOT for this flight will be sent by ETFMS ahead of:
TIS + Taxi Time = 10 + 15 = 25 min.
In other words any better CTOT will be sent with at least 25 min. notice.
No improvement of CTOT for this flight will be sent by ETFMS after:
CTOT - TRS - Taxi Time = 13:00 - 20 - 15 = 12:25

At 12:25, the CTOT = 13:00 is frozen; it will not be changed anymore by ETFMS.

The Permanent Runway Taxi Times timetable allows, for specific periods of time, the implementation of Runway Usage Attributes (Taxi Time, Insert Time, Remove Time) different from the Default values. For the time periods when they are defined, these Permanent values overrule the Default values.

This timetable may therefore be used in two cases:

- To assign different Runway Usage Attribute values at certain times of the day (e.g. a longer Taxi Time value during peak hours);

- To overrule a default Runway Usage Attribute value in a live update (default Runway Usage Attribute values cannot be updated in a live update)

2.3.3 Set of Aerodromes

(1) A set of Aerodromes is defined in NM system to designate, under one name, a collection of Aerodromes that will be used in the definition of other entities:

- 'FLOW'
- 'REFLOC'
- 'RESTRICTION'
- 'ALL' (FLOW + REFLOC + RESTRICTION)

(2) IFPS Aerodrome Groups are also classified as a specific type of Sets of Aerodromes.

2.4 Route

2.4.1 En-route

(1) A route is generally defined as the great circle connection of significant points.

(2) In NM system, a route segment is a straight line on an equidistant projection / cylindrical projection. Beside the geographic location of a route, implied by the significant points which the particular ATS route connects, an ATS route can have more characteristics. These characteristics are defined by the various types of ATS routes.

(3) The term "ATS routes" refers to a published ATS route which is further defined in the AIP of the respective State. Beside the sequence of significant points which this ATS route connects, the AIP contains more important information which has to be considered for flight planning. Amongst others, these are the ATS route designator, vertical limits of each ATS route segment, time applicability, flight level orientation scheme (ODD / EVEN) and the direction in which the ATS route can be used (unidirectional / bidirectional).

(4) The term "Direct" abbreviated as "DCT" refers to a direct connection of two significant points used for flight planning purposes in accordance with provisions of ICAO Doc 4444 PANS-ATM. In NM system, DCT segments are approximated by great circle curves (interpolated at least each 1 degrees of longitude). The DCT is split by points separated by an equal distance such that the distance between 2 split points is below 1 degree of longitude (regardless of distance in latitude) but always above 10 km. Due to this definition, a DCT cannot have any intermediate significant points. Such connections are not published in any AIP and thus generally have less defining parameters. However, when using DCTs in a flight plan, the general rules of the respective airspace, in which the DCT is used, have to be considered. This refers to the flight level orientation scheme (ODD / EVEN) and the vertical limits of the respective airspace.

(5) NM system internal route naming convention

In the NM system all routes are defined in categories. Table below gives overview of categories used:

Category	Abbreviation	Explanation
Category 0 Route	CDR 0	Indicates a normal ATS route, always available
Category 1 Conditional Route	CDR 1	Indicates a route that may be available for flight planning during times published in the relevant National AIP. The AUP/UUP(s) shall notify closures of CDR1s (see Chapter 4).
Category 2 Conditional Route -disbanded-	CDR 2	Indicates a route that may not be available for flight planning. Flights may only be planned on a CDR2 in accordance with conditions published daily in the AUP/UUP(s) (see Chapter 4).
Category 3 Conditional Route	CDR 3	Indicates a route that shall not be available for flight planning at all. Flights shall not be planned on these routes. They are to be used at "ATC discretion".
Category N	CDR N	An internal NM route category naming convention indicating that no flight levels are available in a defined direction within a defined level band.
Category MIXED CDR	CDR M	Indicates a route for which, inside its vertical limits, there is more than one CDR availability.
Category UNDEFINED	CDR U	This indicates a route which is not defined H24. When the route is undefined it means that it does not exist

Table 1: NM CDR Categories

(6) The CDR1/Route track portions provide a description of each segment of the Route/Terminal Procedure.

(7) The CDR1/Route track portions are a directional definition

A CDR1/Route track portion is defined by a From PT and a To PT. In an Arrival Procedure, the last 'To PT' is in fact the connected Aerodrome. In a Departure Procedure, the first 'From PT' is in fact the connected Aerodrome.

(8) For each CDR1/Route track portion, a base definition is built using the following elements:

- FL Range(s) (vertical route definition);
- Route Category;
- Flight Level Series;
- Applicability (date/time period, special dates etc.).

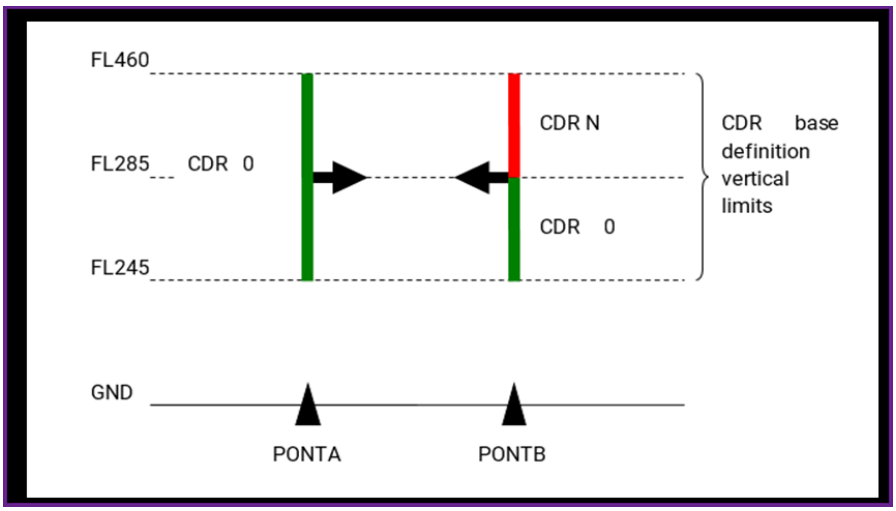


Figure 1: CDR base definition

(9) NM system can distinguish if ATS Route, as defined in CACD, is available in one direction while not existing in the other direction. This is achieved by using CDR U value (Undefined). Using this property will allow filing DCT (if allowed by other conditions) in direction in which route is not available.

Example:

Category 0 Route

ATS ROUTE CAT '0' VESAR UL619 MAKOL is accepted

ATS ROUTE CAT '0' VESAR DCT MAKOL is accepted

Category 0 Route

ATS ROUTE CAT 'U' VESAR UL619 MAKOL is rejected

ATS ROUTE CAT 'U' VESAR DCT MAKOL is accepted

(10) NM system Route properties are:

- Route Identifier
  - ICAO Identifier

    The En-route Route ICAO ID is an ICAO compliant identifier published by the national authorities. The format of the ICAO ID depends on the Route. For Air Routes, there are additional ICAO rules restricting the characters that may be used depending on other characteristics of the routes (e.g. RNAV). These rules are not checked by the system. The ICAO Identifier is not unique across all En-route Routes: homonyms are allowed, and they are distinguished by their CFMU Identifier.
  - CFMU Identifier

    The CFMU Identifier applies only to Air Routes.

    Separate portions of Air Routes that have the same Identifier (homonym Air Routes) are defined separately, using the same Air Route ICAO Identifier for all Air Routes concerned. Since homonym Air Routes are quite common in daily operations, the NM system need a readable unique identification of Air Routes.

    Format: ICAO ID + '/' + first Complete Route Track Point + '-' + last Complete Route Track Point

    Example:

    A1/SU-RK

    A1/XAMAB-VEULE

    A1/BRY-CVO

- Route Type
  - Air Route - An Air Route is published by National Authorities. It is designed for channelling the en-route flow -of traffic as necessary for the provision of air traffic and Air Traffic Flow Management Services,

from the end of the take-off and initial climb phase to the commencement of the approach and landing phase. The term Air Route is used to mean variously, airway, advisory route, controlled or uncontrolled route, etc., excluding arrival and departure routes. The Route Type for an Air Route is 'AR'.

- PTS Routes (Polar Track Structure Route) The PTS Routes are routes that cross the North Pole region. They are defined within the so-called Polar Track Structure (PTS). PTS Routes correspond to recommended tracks to be used on the Europe-Alaska axis. These routes distinguish themselves from other routes because special aircraft equipment is required to use them. Speed indications on these routes are given in Mach in flight plan route description. Special formatted position reports and flight plan rules apply for them. The Route Type for a PTS Route is 'PTS'.

- Length
  The Length attribute of a Route is automatically calculated by the system. It corresponds to the length in NM of the whole Route. It is the sum of the lengths of the straight flight path (so called 'Great Circle') of all the Route Segments composing the Route.

- Route usage
  Route usage reflects what traffic can use the route.
  The allowed values are : MIL, CIVIL, ALL, OTHER
  - CIVIL: route useable for Civil (GAT) traffic only.
  - MIL: route useable for military (OAT) traffic only.
    - Typically the TACAN routes
    - For routes flagged as MIL an EU restriction will be generated automatically reflecting this for the frontline systems
  - ALL: Routes that can be used by all traffic

  Mixed routes for which some segments are CIVIL but others are MIL shall be flagged as ALL but for the MIL only segment ADS will create a EU restriction manually.

- Complete route track
  The Complete route track is the layout of the Route as a list of all the Significant Points that compose it.
  Note: The Complete route track may contain Significant Point homonyms providing that they belong to different countries.

- Vertical limits
  The Vertical Limits are the FL ranges and time applicability specifying the existence of the Route for each Route Segment. Outside the Vertical Limits (FL range and time applicability), the Route does not exist, it is "undefined".
  Note: a DCT that would be rejected by IFPS if the concerned segment was defined as closed (CDR N) in the Route track portions may be accepted by IFPS if this segment is "undefined" in the Vertical Limits.

The Vertical Limits are used in the context of Free Route Airspace to specify the existence of a Route (or a certain FL range of a Route) only during certain days/times. E.g. an Air Route could exist only during day time, and not during night time when Free Route Airspace is active.
For an En-route Route, the Vertical Limits apply to the whole Route Segment and are specified in a single direction: from the first point to the last point of the Complete route track. If the Route Segment is bi-directional, the same Vertical Limits apply to both directions.

- Route track portion definition
  The Route Category portions provide a description of each segment of the Route. Not each segment must be defined individually, but each segment must be covered by the definition of an eventually longer Route Category portion. A split is done when the Route definition is changing (e.g. different FL range) and additionally at each national boundary point (for data maintenance purposes). A Route Category portion is defined by a From PT and a To PT. The Route Category portions are directional. For each CDR portion, a CDR base definition is built using the following elements:
  - FL Range(s);
  - Route Category;
  - Flight Level Series;
  - Applicability.

2.4.2 Terminal Procedure Properties

(1) In NM system the Terminal Procedures (TP) are classified as:

- Departure Procedures (SID) - a designated instrument flight rule (IFR) departure route linking the aerodrome or a specified runway of the aerodrome with a specified significant point, normally on a designated ATS route, at which the en-route phase of a flight commences;
- Arrival Procedures (STAR) - a designated instrument flight rule (IFR) arrival route linking a significant point, normally on an ATS route, with a point from which a published instrument approach procedure can be commenced.

(2) Apart from this distinction, Arrival and Departure Procedures have common properties:

- Terminal Procedure Identifier
  Both the Terminal Procedure ICAO Identifier and the Terminal Procedure non-ICAO Identifier are optional, but one of the two Identifiers is mandatory.
- ICAO Identifier
  The Terminal Procedure ICAO ID is an ICAO compliant identifier published by the States. In NM system the non-ICAO Identifier might be used either:
  - When the identifier published by the State is not compliant with ICAO naming conventions, or
  - When the Terminal Procedure is not published officially but is exceptionally required for correct profile calculations (“dummy” TP).

  In practice, published non-ICAO compliant identifiers may appear in flight plans; when such an identifier is defined as a Synonym of a Terminal

Procedure in the CACD, the corresponding Terminal Procedure is recognised by the NM system and used for the profile calculation.

- Route Type

  Defined upon creation of a Terminal Procedure and cannot be modified thereafter. For Terminal Procedures, the Route Type takes one of:

  - "STAR" (Standard Instrument Arrival) for an Arrival Procedure;
  - "SID" (Standard Instrument Departure) for a Departure Procedure;
  - "IAP" (Instrument Approach procedure) for an Arrival Procedure.

- Length

  Attribute of a Terminal Procedure is automatically calculated by the system. It corresponds to the length in NM of the whole Terminal Procedure (from the first point to the Aerodrome for an Arrival Procedure, from the Aerodrome to the last point for a Departure Procedure). For each segment of the Terminal Procedure, a straight distance (so called 'Great Circle' distance) is followed.

- Connects to AD
  Used to specify the Aerodrome for which the terminal Procedure is published and applies. Exactly one Aerodrome must be specified.

- Virtual Length
  It is automatically calculated by the system, taking into account the eventual Virtual length(s) specified in the segments of the Route Track portions definition. It corresponds to the real (operational) length in NM of the whole Terminal Procedure (from the first point to the Aerodrome for an Arrival Procedure, from the Aerodrome to the last point for a Departure Procedure). For each segment of the Terminal Procedure, the system considers:

  - the straight distance ("Great Circle") when no Virtual length is specified for that segment;
  - a longer distance, the segment's Virtual length, when a value is specified.

  It follows that if none of the segments has a Virtual length value specified in the Route track portions, the Virtual length of a Terminal Procedure is equal to its Length.

- Initial Approach Fix (IAF)
  Only applicable to STARs. It is a point that connects the Arrival Procedure and the instrument approach procedure, as published in the AIP.

- Connecting point
  Specified in a Terminal Procedure are the published Significant Points of the Complete Route Track that may serve as connecting point to the en-route phase. It means that a flight may join an Arrival Procedure or leave a Departure Procedure only at one of these Points. The first point of an Arrival Procedure and the last Point of a Departure Procedure must be defined as Connecting points.

- Connected Runways
  The Runway Directions specified under Connect runway(s) are those corresponding to the Terminal Procedure. At least one Runway Direction must be connected to a Terminal Procedure.

- Complete Route Track
  The layout of the Terminal Procedure as a list of all the Significant Points that compose it, plus the Connected Aerodrome. For an Arrival Procedure, it ends with the Connected Aerodrome. For a Departure Procedure it starts with the Connected Aerodrome.

- Vertical limits
  The Vertical Limits are the FL ranges and time applicability specifying the existence of the Route for each Route Segment. Outside the Vertical Limits (FL range and time applicability), the Route does not exist, it is "undefined".
  Note: CACD allows to define vertical limits of SIDs, STARs and IAPs on the Point.
  Note: In the case a DCT is collocated with a route segment, the DCT will be rejected by IFPS if the concerned route segment is defined as closed (CDR N) or CDR 3 in the Route track portions. It may be accepted by IFPS if the collocated route segment is "undefined" in the Vertical Limits.
  The Vertical Limits are used in the context of Free Route Airspace to specify the existence of a Route (or a certain FL range of a Route) only during certain days/times. E.g. an Air Route could exist only during day time, and not during night time when Free Route Airspace is active.
  The Vertical Limits apply to the whole Route Segment and are specified in a single direction, the one of the Terminal Procedure: from the first point to the last point of the Complete route track.
  There must be no overlap in FL range and applicability.

2.5 Airspace

2.5.1 Definition

(1) Airspace is any specific three-dimensional (3D) portion (volume) of the atmosphere.

(2) This volume is defined by lateral and vertical boundaries.

2.5.2 NM System expression

(1) The airspaces defined in NM system have an essential role in ATM because they are used to create a virtual description of the real Airspace. As an example, these airspaces are used to represent the relevant active ATC sectors, the areas of responsibility, the restricted areas, and other areas as required for NM activities.

(2) Airspace in NM system can be built by defining airblocks (horizontal polygon) and vertical boundaries, or they are composed of airspaces of another type. An airblock is not airspace as such, but it is the initial construction element to build up Airspace. It is in fact a set of geographical positions (Significant Point or Geographical Co-ordinates), representing a surface. The maximum number of airblocks allowed in CACD is presently 12000. The maximum number of geographical positions in an airblock is presently 2000.

(3) To allow more flexibility when capturing traffic, especially in FRA, and to allow more tailor-made definitions for flow elements, reference locations both in restrictions or traffic volumes, CACD allows to creation of special airblock called "Gate".

• A Gate must be based on minimum 2 points and maximum 2000 points

• The Gate will be automatically generated by the system

• The width of the Gate will be defined between 2 and 16 NM

• The Gate is to be used in an airspace that can be used in RL, TV, FW and RS.

(4) As in NM system the airspaces are used for different purposes, they are classified into three distinct categories, which determine the airspace usage (Administrative, Operational, Manageable airspace).

(5) **Administrative airspace**

This airspace includes the following sub-types:

- Information Region (IR)

  It represents a part of the airspace within which Flight Information Service and Alerting Service are provided. It is the regional subdivision of a country's national airspace. Airspace type IR is used to represent Flight Information Regions (FIRs), Upper Information Regions (UIRs), Part of Flight Information Region [FirP], Part of Upper Flight Information Region [UirP], Oceanic Transition Area [OTA] and No FIR [FIRN]. An IR is composed of one or more Airblocks (AB). It does not take into account any airspace delegation between ATC units. Every Information Region (IR) has to be part of a single National Airspace (NAS), except Part of Flight Information Region [FirP] or Part of Upper Flight Information Region [UirP] at the condition that they are associated with an FIR or UIR. In this case the FirP or UirP is a part of and overlaps with the associated FIR or UIR.

- National Airspace (NAS)

  It is an Airspace Volume composed of one or more IRs. A National Airspace is associated to a system unit corresponding to the country that is responsible for that Airspace. National Airspaces are used in the FUA concept to make the link between the country (NAS) and the appropriate Unit of type AMC. The National Airspace is also used to derive the link between a country and several other NM entities (significant points, aerodromes, airspaces etc.).
  Example: If a State has an FIR and a UIR, the NAS is the combined airspace volume of the FIR and UIR. If a State has only an FIR, then the NAS is the FIR.

- Area

  An Area is composed of zero or more NAS and of zero or more IRs. There must be at least one element NAS or one element IR. The client systems (e.g. IFPS, ETFMS, RSO etc.) need pre-defined geographical Areas in order to know how to treat a flight, based on the area where it is located, or has departed, or has arrived. The Area concept also enables definition of the geographical 3D Area and to associate it automatically via the geometrical properties to the NM entities (e.g. AD, PT, AS). An IR element of an Area is not owned by a NAS element of the same Area. An Area cannot be used as a 'Count Area' in ETFMS.

(6) **Operational airspace**

It represents the division of the Airspace for the provision of air traffic control service and includes the following sub-types:

- Elementary Sector (ES)

An Elementary Sector is an Airspace Volume, built up from one or more Airblocks (AB) to which a vertical dimension is added by means of FLs.

An Elementary Sector is identified by up to 10 (ten) characters, starting with Location Indicator - ATC Unit 4 (four) letter ICAO code followed by an Airspace Indicator - combination of maximum 6 (six) alphanumeric characters indicating a further specification, e.g. EDGGGIN, EISNA.

- Collapsed Sector (CS)

  A Collapsed Sector is a combination of Elementary Sectors. It is built up of two or more distinct Elementary Sectors, usually belonging to the same AUA (ATC Unit Airspace).

  Exceptionally, it is also possible to create a Collapsed Sector composed of Elementary Sectors belonging to different AUAs. This covers the operational requirement of monitoring sectors that belong to more than one AUA. Such Collapsed Sectors cannot be used in the Sector Configurations of an AUA. However, they may be used as Reference Location of Traffic Volumes (which may not be “MO”).

- ATC Unit Airspace (AUA)

  An ATC Unit Airspace (AUA) is a volume built up of one or more Elementary Sectors. It is the type of Airspace representing the complete Airspace for which a particular unit is responsible for provision of air traffic control service.

  ATC Unit Airspaces are essential NM system entities as they are the link between the Airspace and Addressing of flight plan or associated messages and are optionally used to reflect the dynamic operational organisation of the Airspace through the Sector Configurations.

  Following sub-types exist: ATZ (Aerodrome Traffic Zone), CTA (Control Area), CTR (Control Zone), HTZ (Helicopter Traffic Zone - non ICAO), OCA (Oceanic Control Area), TMA (Terminal Control Area), UTA (Upper Control Area).

  Each AUA is linked to exactly one Unit (UT) of type ACC, APP, OAC, UAC or TWR.

  This is reflected in the Unit (UT) types that are connected to the AUA.
  Example: The AUA ENOBOCA (type OCA) is connected to the UT OACENOB of UT type OAC.

  Each AUA linked to a Unit of type ACC, OAC, or UAC, will have at least one Sector Configuration, unless the sector configuration is defined at cluster level.

  An AUA can be partitioned into Clusters. A maximum of 9 Clusters is allowed for each AUA. Each Cluster is composed of at least one (but usually more) of the Elementary Sectors of the AUA. Altogether, the Elementary Sectors of the Clusters correspond to the Elementary Sectors of the AUA. When an AUA is partitioned into Clusters, it cannot have Sector Configurations. Instead, the Sector Configurations are defined and activated in each of its Clusters.

- ATC Unit Airspace Group (AUAG)

  An ATC Unit Airspace Group (AUAG) is a volume built up of:

- one or more AUAs; or
- different AUAGs.

An AUAG can be used to group AUAs that correspond to a given IR. The difference between an AUAG and a relevant IR is that the AUAG also comprises the possible cross border Airspace delegations.

- Region

Region is an internal concept, unknown as such outside the NM.

A Region is a volume built up of one or more ATC Unit Airspace Groups (AUAG), ATC Unit Airspaces (AUA), or Elementary Sectors (ES).

An ES element of a Region may not be owned by an AUA element of the same Region and an AUA element may not be owned by an AUAG element of the same Region. There is consequently no overlap between the elements that compose a Region.
Presently, Regions are used to represent Airspaces with particular 8.33 kHz radio equipment requirements, for the Mode-S implementation, or for CCAMS (Centralised Code Assignment and Management System) implementation. A Region cannot be used as a 'Count Area' in ETFMS.

(7) **Manageable airspace**

- Regulated Airspace (RAS)

In the context of the developing FRA concept, the current usage of pre-existing AUA/G's or sectors for the creation of FRA Restrictions is inadequate as FRA implementations are based on partial AUAs and/or partial Elementary Sectors. Hence the need to create specific FRA volumes emerged.

For operational requirements and safety reasons, a FRA with variations in vertical limits that do not coincide with existing AUA's or sectors was required.

Subsequently a new airspace type RAS (Regulated Airspace category "FRA" or "DCT") was introduced. A RAS can coexist with other airspaces, both administrative and operational. It allows the definition of FRA starting from ABs, possibly inherited from existing airspaces and sectors. It can aggregate sectors, CTA/UTA and FIR/UIR hence allowing, in the cross-border restrictions, the definition of borders between FRA airspaces and AUAs or FIRs. The time element and vertical limits are live updateable in the restriction referring to the RAS.

RAS can be:
- Elementary Regulated Airspace ERAS;
- Composed Regulated Airspace CRAS.

- Reserved / Restricted airspace

Reserved / Restricted Airspaces (RSA) represent a part of the Airspace where General Air Traffic (GAT) can be restricted (in future also OAT not using RSA). In practice, it corresponds in most cases with airspace where events may take place.

For more details see also Chapter 4.

(8) The airspace classification and naming conventions in NM system are at least partly aligned with AIXM (Aeronautical Information Exchange Model) in view of the exchange of data with EAD.

2.6 Direction of cruising levels

2.6.1 Definition

(1) The Flight Level Orientation Scheme (FLOS) applicable within each State's airspace corresponds to the Table of Cruising levels in accordance with Annex 2, Appendix 3, a) and State AIP ENR 1.7.

(2) For expression of the direction of cruising levels the terms ODD / EVEN are used with the following meaning:

- "ODD" are considered those FLs which are within magnetic track margin of either 000° - 179° or 090° - 269° (FL010, FL030 …, FL310, FL330 …FL410…etc.);
- "EVEN" are considered those FLs which are within magnetic track margin of either 180° - 359° or 270° - 089° (FL020, FL040 …, FL300, FL320 …FL430…etc.).

2.6.2 ATS Route

(1) The each ATS route has mandatorily defined direction of cruising levels in State AIP ENR 3.

(2) It is possible the direction of cruising levels for a particular ATS route or ATS route segment published in ENR 3 to be different from ENR 1.7 FLOS.

2.6.3 DCT

(1) The direction of cruising levels used along relevant DCT segment is described in Column "Direction of Cruising Levels" in RAD Annex 3B.

(2) This data is for information purposes only, not mandatory and is included if provided by the States / FABs / ANSPs.

(3) The FLOS applicable via DCTs in some State is different and overrides ENR 1.7.

2.6.4 FRA significant points

(1) In FRA, regardless of the existence of the ATS route network, there are flights towards a relevant FRA significant point from different directions; however they are in accordance with the published FLOS.

(2) Deviations from the published direction of cruising levels are necessary in several cases for operational reasons related to ATC unit responsibility of the same FL (ODD or EVEN) over a FRA significant point.

(3) Currently all FRA significant points and direction of cruising levels are published in State AIPs as part of either ENR 4.1 or ENR 4.4 remarks.

2.6.5 NM System expression

(1) The ATS route direction of cruising levels is included in NM system.

(2) The DCT direction of cruising levels is NOT included in NM system.

(3) The FRA point direction of cruising levels is included in NM system as part of the FRA points definitions.

(4) NM system is not hard checking the compatibility between the direction of cruising levels and flight plans filed.

2.7 NM static and live updatable data

Domain	Allowed live creation	Allowed live update
Significant Point	N/A	Point-to-Airspace relationship Significant Point Capacities Point usage
Airblock	Urgent live creation possible under strict conditions	N/A
Airspace	Urgent live creation possible under strict conditions	Airspace Capacities *AUA or Cluster Sector Configurations (only addition)* *AUA or Cluster Sector Configurations Activation* RSA Activation table RSA CDR Info (Nearby, Excluded CDRs) ERSA Availability
Aerodrome	N/A	Aerodrome Permanent Runway Taxi Times timetable Aerodrome Capacities Aerodrome Mode-S flag Aerodrome to a Set of Aerodromes (only addition)
Set of Aerodromes	Set of Aerodromes	Set of Aerodromes Capacities
Route	Terminal Procedure OTS Route[2]	Runway Direction assignment to a Terminal Procedure (only addition) *En-route Route « Vertical Limits »* *En-route Route CDR Definition (CDR portions up, CDR portion down, CDR Update)* *Terminal Procedure CDR Definition (CDR portions down)*
Reference Location	Reference Location	Associated Flows (only addition)
Flow	Flow	N/A

Traffic Volume	Traffic Volume	Traffic Volume Name, Category & Note Traffic Volume Activation Traffic Volume Capacities Traffic Volume OTMV
Traffic Volume Set	Traffic Volume Set	Traffic Volume Set composition
Unit	Unit (except types CO, AMC, EN, ATSS)	Unit parameters Unit parentship relations Unit passes-message-to relations Unit addresses Unit associated Aerodrome
Aircraft Type	N/A	N/A
Traffic Flow Restriction	Traffic Flow *Restriction* Traffic Flow restriction from RAD@NMP	*Hard/Soft classification* *Operational Goal* *Textual Description* *B2B export flag* *Enabled flag* *Is Enabled for Auto DST change flag* *Flow Routings (Mandatory/Forbidden/Closed for Cruising flag, Sequences and Elements)* *Flow Conditions (Included Location Condition, Second Location Condition, Flight Property Conditions Group)* *Basic Applicability* *Dependent Applicability* *Updates from CASTAR* *Only RAD Annex 2* *Incremental updates on hold , pending for confirmation*

Profile Tuning Restriction	Profile Tuning Restriction	*Operational Goal* *Textual Description* *B2B export flag* *Airborne Only flag* *Enabled flag* *Is Enabled for Auto DST change flag* *Flow Routings (Mandatory/Forbidden flag, Sequences and Elements)* *Flow Conditions (Included Location Condition, Second Location Condition, Flight Property Conditions Group)* *Basic Applicability* *Dependent Applicability*
Aerodrome Flight Rule Restriction	Aerodrome Flight Rule Restriction	*Textual Description* *B2B export flag* *Enabled flag* *Is Enabled for Auto DST change flag* *Basic Applicability*
Flight Property Restriction on TP	Flight Property Restriction on TP	*Operational Goal* *Textual Description* *B2B export flag* *Enabled flag* *Is Enabled for Auto DST change flag* *Flow Routings (Mandatory/Forbidden flag, Sequences and Elements)* *Flow Conditions* *Basic Applicability*
DCT Limitation Restriction	DCT Limitation Restriction	*B2B export flag* *Enabled flag* *Is Enabled for Auto DST change flag*

		DCT Segments (Routing Elements) *Flow Conditions (Military Flights, DCT Distance Limitation)* *Basic Applicability*
FRA DCT Restriction	FRA DCT Restriction	*B2B export flag* *Enabled flag* *Is Enabled for Auto DST change flag* *DCT Segments* *FRA Points* *Flow Conditions (Military Flights, DCT Distance Limitation)* *Basic Applicability*
SSR Code Allocation Restriction	SSR Code Allocation Restriction	Enabled flag *Is Enabled for Auto DST change flag* *SSR Code Definitions* *Flow Conditions* *Basic Applicability*

Live updates that are not automatically propagated appear in *italic*.

3 Airspace Utilization Rules and Availability (AURA)

3.1 Purpose

(1) The purpose of this Chapter is to describe the use of airspace utilisation rules and availability (AURA) restrictions for expression and flight plan processing. The Chapter also contains the definition of terms used in the RAD to describe and express the utilization of the European airspace.

(2) This Chapter covers the following AURA restrictions and their available features:

- RAD traffic flow rules;
- FRA (Free Route Airspace) DCT Restriction;
- DCT Limitation Restriction;
- Profile Tuning Restriction (PTR);
- EU / EURO restrictions;
- Aerodrome Flight Rule Restriction;
- Flight property Restriction on Terminal Procedure.
- AURA FUA including FBZ and NPZ (for description see chapter 4)

(3) For NM system purpose, it is considered that the RAD includes restrictions and in this Chapter word “restriction” is used, where appropriate.

3.2 AURA Restrictions Parameters

3.2.1 Restriction Identifier

It is a unique and clear Identification of the Restriction that serves through the RAD as a common reference for the NM, EAD, the ANSPs and the various flight planning systems. A Restriction Identifier is composed of an Origin ID + a Group ID + a sub-group ID. If a given Restriction expression requires the creation of several ‘sub’ Restrictions, they are imperatively kept together by allocating the same Origin and Group ID and by giving them a different subgroup ID.

Example: EH2010A = ‘EH’ + ‘2010’ + ‘A’

The tables below represent the NM AURA Naming Convention for Restriction Identifiers.

Restriction type	Restriction subtype	RAD publishable	Info Source	Specific Request	Origin ID	Group ID	Subgroup ID
Traffic Flow	City pair level capping	YES	RAD DOC ANNEX 2A	NO	Country/FAB code ID(s)	4000 to 4999	A, B, C…
	RAD Pan-European Annex	YES	RAD DOC ANNEX 2B	NO	Country/FAB code ID(s)	2000 to 3999	A, B, C…
	RAD Pan-European Annexes cross border restrictions	YES	RAD DOC ANNEX 2B	NO	Country /FAB code ID(s)	1000 to 1499	A, B, C …
	Plain text notes	YES	RAD DOC	NO	Country /FAB code ID(s)	6000 to 6999	A, B, C …
	Scenarios	YES	NEC/NM pretact	YES	"EU" + 0 to 2 alphanumeric	1 to 5 alphanumeric (no leading "0")	A, B, C…
	AIP constraint	YES	NEC/AIP	YES	"EURO"		A, B, C…
	Unavailable Terminal Procedures	YES	NEC	YES	Aerodrome ID	3000 to 3999	A, B, C…
	Conditions on DCT segments Point-Point	YES	RAD DOC ANNEX 3B	NO	Country /FAB code ID(s)	5000 to 5499 and 50000 to 54999	A, B, C…
	Conditions on consecutive DCT segments Point-Point	YES	RAD DOC ANNEX 3B	NO	Country/FAB code ID (s)	6100 to 6499	A, B, C…
	Conditions on DCT segments to/from AD	YES	RAD DOC ANNEX 3A	NO	Country /FAB code ID(s)	5500 to 5999	A, B, C…
	FUA restrictions	YES	AMC/ RAD DOC ANNEX 2C	YES	RSA ID as per AIP	R, S,… Y*	A, B, C…
	Special event or military activity/exercise	YES (except politically sensitive: No)	NEC/NM Strategic/ MILO/AMC	YES	"EU" + 0 to 2 alphanumeric	1 to 5 alphanumeric (no leading "0")	A, B, C…
	Non-standard Planning Zone (NPZ)	YES	AIP	NO	Country ID(s)/ "EC", if zone is located across two or more State borders	NPZ followed by 1 to 999	A, B, C…
	Summer ATFCM measures	YES	RAD Special Events Annex	NO	'NM'	1 to 5 alpha-numerics (no leading "0")	A, B, C…
Profile tuning	LOA std. agreed levels	On request	NEC/LEC/FMP	YES	Country/FAB code ID(S) or IR ID	8000 to 8999	A, B, C… + "AO" if Airborne only
	Particular IR	On request	NEC/LEC/FMP	YES	IR ID	1500 to 5999	A + "AO" if Airborne only
	AD or TMA/CTR	On request	NEC/LEC/FMP	YES	Aerodrome ID	1500 to 2999	
	Other	On request	NEC/LEC/FMP	YES	Country /FAB code ID	9000 to 9999	
DCT limitations	AUA/AUAG/RAS	YES	RAD DOC ANNEX 3B	NO	AUA/AUAG/RAS first 2 or 4 characters or FAB ID	1 to 99	A, B, C…
	AD	YES	RAD DOC ANNEX 3A	NO	Aerodrome ID	5 (AURA@nCONECT)	A, B, C…
	Cross-Border	YES	RAD DOC ANNEX 3B	NO	Country code ID(s)	400	A, B, C…
FRA DCT Restrictions	AUA/AUAG/RAS	YES	AIP/AIC	YES	AUA/AUAG/RAS first 2 or 4 characters or FAB ID	100 to 499	A, B, C…
	Cross-Border	YES	AIP/AIC	YES	Country code ID(s)	500 to 599	A, B, C…
Aerodrome flight rule		YES	AIP	YES	Aerodrome ID	200	A, B
Flight property on terminal procedure	Normal	YES	AIP	YES	Aerodrome ID	300	A, B, C…
	Not Flight-plannable (erroneous CACD data)	YES	NEC/NOTAM	YES	Aerodrome ID	700	A, B, C…

Table 2: NM AURA Naming Convention for Restriction Identifiers

** Note: In case of more than 8 FUA restrictions per RSA the NM RAD Team in coordination with relevant NRC/s and/or other NMOC Team/s is authorised to use other letters starting with Q on reversed order (Q, P, N, M, etc. with no use of letters "O" and "I").*

Prefix code	Region / FAB / ANSP (State / ANSP)
BL	BALTIC FAB (Poland, Lithuania)
BM	BLUE MED FAB (Italy, Greece, Cyprus, Malta)
CE	FAB CE - FAB CENTRAL EUROPE (Austria, Czech Republic, Croatia, Hungary, Slovakia, Slovenia, Bosnia and Herzegovina)
DU	DANUBE FAB (Bulgaria, Romania)
DS	DENMARK / SWEDEN FAB (Denmark, Sweden)
EC	FABEC - FAB EUROPE CENTRAL (France, Germany, Switzerland, Belgium, Netherlands, Luxembourg, Maastricht UAC)
NE	NORTH EUROPEAN FAB (Estonia, Finland, Latvia, Norway)
PE	SOUTH WEST FAB (Spain / Portugal)
IU	UK / IRELAND FAB (United Kingdom, Ireland)
YX	Maastricht UAC
RE	Regional / Pan-European / Axis
Regional	
RE	Between three or more States/FABs/ANSPs
Network	
NM	Network-wide (Pan-European, Axis)

Table 3: NM AURA Naming Convention for Restriction Identifiers

3.2.2 Operational Goal

(1) The Operational Goal describes briefly the operational goal the originator wants to achieve through the Restriction.

(2) Operational Goal shall provide better description, clear definition and explanation of a RAD requirement, aimed to prevent an inappropriate flight planning.

(3) Stating the Operational Goal of a restriction is mandatory.

3.2.3 iOAT flag

(1) NM is able to receive, process and distribute Improved OAT flight plans (iOAT), including mixed GAT/OAT flight plans (See Chapter 5.7 iOAT Flight planning).

(2) The national AIP must specify the conditions in which the iOAT flight plan should be used for military IFR flights in controlled airspace.

(3) iOAT defines applicability of the rule:

- iOAT ONLY - the rule applies to iOAT flights only
- All Flights - the rule applies to all flights (GAT & OAT flights)
- Non iOAT - the rule applies to non iOAT flights (= GAT flights) and GAT portions in iOAT flights. The default value of the flag is NON iOAT

(4) Specific conditions (Flight Status) for OAT flights filing iOAT flight plans shall be inserted into CACD. This indicator decides for which kind of flight plan the rule is valid (STS EUR/OAT).

3.2.4 Flow Routings

(1) A restriction is either:

Forbidden (or "Not allowed" (N) for a DCT Limitation or a FRA DCT restriction). Flow routing marked as Forbidden cannot be flown by the flights corresponding

to the conditions of the restrictions. At least one flow routing element must be defined. If several are defined, all of them are forbidden. Flight plans filed through any of these routings will be invalidated.

Mandatory (or "Allowed" (Y) for a DCT Limitation or a FRA DCT restriction). Flow routing marked as Mandatory must be flown by the flights corresponding to the conditions of the restrictions. At least one flow routing element must be defined. If several are defined, all of them are mandatory. Flight plans not filed through any of these routings will be invalidated.

Closed for Cruising is used to forbid straight and level flights in the reference location. The RL can be a route portion or an airspace that correspond to the conditions of the restrictions. Flight plans which traverse the RL in cruise will be invalidated. Those that traverse in climb or descent will be valid.

Forbidden for DCT is used to indicate that, in a particular airspace, DCT cannot be filed. The flight plan which corresponds to the conditions of the restrictions must refer to a route or a DCT shorter than the limit. The reference location which can be any type of Airspace or a vertical slice thereof is not repeated as a flow routing.

Closed is used to close the reference location for any type of flight if it corresponds to the conditions of the restrictions. A flight plans which traverses the reference location will be invalidated. The reference location can be a route portion of an airspace.

Closed for entry DCT is used to indicate that, in a particular airspace, DCT to a particular point cannot be flown. Flight plans which correspond to the conditions of the restrictions and which have a DCT to that point will be invalidated. At least one point must be defined. If several are defined, DCT to any of these points are forbidden.

Closed for exit DCT: is used to indicate that, in a particular airspace, DCT from a particular point cannot be flown. Flight plans which correspond to the conditions of the restrictions and which have a DCT from that point will be invalidated. At least one point must be defined. If several are defined, DCT from any of these points are forbidden.

(2) For each separate element a level range can be specified which narrows down vertically the selected flow of traffic. The different Flow Routing Sequences are bound by the Operand "OR". The different Routing Elements within a Flow Routing Sequence are bound with the operand "AND THEN".

(3) For most types of Restrictions, different possible Flow Routing Elements are the following:

a) **Significant Point / Point Sequence / Set of Points**

- When a Significant Point is used as a Flow Routing Element, then overflying that point is either forbidden or mandatory at the specified level range.
- When a sequence of Significant Points is used as a Flow Routing Element then overflying is either forbidden or mandatory in the same sequence as the points are listed, at the specified level range regardless which intermediate points are overflown, if any at all.
- For Traffic Flow Restrictions only significant points shall be used.

Example: KOK NIK (any route between KOK and NIK)

b) **Airspaces**

- When Airspace is used as a Flow Routing Element then its penetration is either forbidden at entry or mandatory at entry the specified level range.
- All values are allowed for the vertical limits except if the vertical range is completely outside the Airspace.

c) **Terminal Procedures**

- When a Terminal Procedure is used as a Flow Routing Element then it is the ID string as such which is restricted. It means that the use of the Terminal Procedure is restricted regardless which of the points is used as transition point (Point where the en-route structure is joined/left).
- For mandatory Flow Routings (DCT Segments, Terminal Procedures and Route Portions) ending at an Aerodrome, the minimum level for NM system purposes is set to GND.
- For forbidden Flow Routings ending at an Aerodrome the maximum level for NM system purposes is set to UNL.
- Vertical Limits may not be defined for Flow Routings originating from an Aerodrome. Only Terminal Procedures with an ICAO compliant Identifier can serve as a Flow Routing Element.

d) **DCT Segment**

- If a DCT segment is mentioned as a Flow Routing Element then only that explicit DCT will be restricted and not any route collocated with it

  Example: KOK DCT NTM is forbidden, then the flight may still route KOK UL123 NTM or KOK DCT NIK DCT NTM (DCT needs to appear in the flight plan).

e) **Route Portion - ID Relevant**

- If a Route Portion is mentioned as a Flow Routing Element then it is not the string as such but the Route ID and the segments it represents. The flight plan must also mention the route ID. This can be as well a segment of a Terminal Procedure. The complete route portion can be restricted at one specified level.

  Example 1:
  KOK UL607 NTM is forbidden with Route ID Relevant in a Traffic Flow Restriction:
  - *A flight compliant with the conditions cannot fly along this specific route from KOK to NTM but is allowed to enter the route intermediately. To avoid this KOK UL607 NTM will be split into all the intermediate segments;*
  - *A flight compliant with the conditions can still fly KOK G1 NTM or KOK UN123 NTM (fictitious) although it is concurrent with UL607.*

  Example 2:
  KOK UL607 NTM is mandatory with Route ID Relevant in a Traffic Flow Restriction:
  - *A Flight compliant with the conditions must fly this sequence of segments at least from KOK to NTM along the UL607 within its vertical*

limits. It is known to the client systems if the flight plan joins before the FROM point of the portion and/or leave it after the TO point of the portion.

f) **Route Portion - Point List**

- If a Route Portion is mentioned as a Flow Routing Element then it is not the string as such but the segments resulting from the expansion of the portion (the sequence of points is restricted despite the name of the RT in between them). These route portions do not expand Terminal Procedures anymore. The complete route portion can be restricted at a specified level range. It is a necessary to insert exactly concurrent routes because sometimes upper and lower routes are not the same (M725 VLM - TABEM - OKF and UM725 VLM - OKF).

  Example 1:
  KOK UL607 NTM is forbidden with Route portion-point list in a Traffic Flow Restriction:
  - *A flight compliant with the conditions cannot fly along this sequence of points from KOK to NTM but is allowed to fly part of this route portion.*
  - *A flight compliant with the conditions cannot fly KOK G1 NTM or KOK L607 NTM (fictitious) if they are 2D concurrent with UL607 (exactly the same sequence of points).*

  Example 2:
  KOK UL607 NTM is mandatory with Route portion-point list in a Traffic Flow Restriction:
  - *A flight compliant with the conditions must fly this sequence of points at least from KOK to NTM along any route.*
  - *It is known to the client systems if the flight plan route description joins before the FROM point of the portion and/or leave it after the TO point of the portion.*

g) **Combination of Flow Routing Elements**

- Different type of Flow Routing Element can be combined. Some examples can be found below:
  Example 1: KOK UG1 NTM UL607 KRH.
  Example 2: KOK UG1 NTM RUWER WRB).
  Example 3: EBBR DIK3C DIK / EBBR DIK3C DIK UG109 KRH / EBBR DIK3C DIK, MMD, GTQ.

h) **Flow Routing Element Level Range**

- A Separate Level range can be specified per Element of the Flow Routing. The level Range will be expressed as a FL (F + 3 numeric). GND, UNL, FLR and CEL are additionally accepted values but only for NM system purposes. FLR and CEL can only be used for Airspaces.
- A level range attached to a SID/STAR will be valid for the complete Terminal Procedure, meaning for a SID from the Aerodrome to the connecting point and for a STAR from the connecting point to the Aerodrome.
- For mandatory Flow Routings (DCT Segments, Terminal Procedures and Route Portions) ending at an Aerodrome the minimum level for NM system purposes is set to GND.
- For forbidden Flow Routings ending at an Aerodrome the maximum level for NM system purposes is set to UNL. Vertical Limits may not

be defined for Flow Routings originating from an Aerodrome. Each Flow element within a sequence can have different level ranges.

Examples:
EBBR DIK3C GND\F195
EBBR DIK3C GND\F195, DIK F120\F195, RUWER F195\240
KOK UG1 NTM F195\280, KRH F280\UNL
EBURUIR F290\F410
BHD 260\UNL, ARE F195\F260

3.2.5 Flow Conditions

(1) For most types of Restrictions, Flow Conditions can be expressed as one or several Locations and/or a Flight Property. One of the conditions (that has to be repeated if several location conditions are 'OR') must serve as the Reference Location for the applicability of the Restriction.

a) **Location Condition**

- Departing Location Condition can be:
  - Aerodrome(s);
  - Sets of Aerodromes;
  - Airspace(s) representing all Aerodromes situated within the lateral limits of the Airspace projection at ground level;
  - Combination of above elements.

  The different elements within a Departing Location Condition Cell are bound by the logical operand 'OR'. If Airspace is used, it shall contain at least one Aerodrome in its projection at ground level.
- Crossing Location Condition - can be:
  - Significant point(s);
  - Airspace(s);
  - Airspace Border;
  - Route Portion(s), Point List;
  - Route Portion(s), route ID relevant;
  - SID / STAR;
  - DCT segment(s).

  Airspace Border is the curtain-like surface which occurs where one Airspace abuts another with the same category (Administrative Airspace, Operational Airspace and Restricted Airspace (RSA)). It is thus NOT the 2D borderline made out of the two adjacent Airspaces horizontal projections.

  The ID of a border will consist of the two relevant Airspaces.
  Example: The border between Brussels CTA and Reims CTA will be EBBUCTA LFEECTA.
  Direction is implied by the order of the Airspaces i.e. EB / ED means traffic coming from the Belgian Airspace to the German Airspace.

  The different elements within one Crossing Condition Cell are bound by the logical operand 'OR'.

A Maximum of 4 Crossing Conditions Cells bound by an 'AND THEN' operand are allowed in the included Location condition group.

- Arriving Location Condition can be:
  - Aerodrome(s);
  - Sets of Aerodromes;
  - Airspace(s) representing; all Aerodromes situated within the lateral limits of the Airspace projection at ground level;
  - Combination of above elements.

  The different elements within an Arriving Location Condition Cell are bound by the logical operand 'OR'. If Airspace is used, it shall contain at least one Aerodrome in its projection at ground level.

b) **Included Location Conditions Group**

- At least one Included Condition Element shall be specified. Between the different included Location groups, an 'AND THEN' relationship exists. This means that only the flights that are compliant with the sequence of conditions will be selected. The sequenced Crossing Location Condition Cells allow selecting specific flows of traffic. The sequence of the elements must be specified in the correct flight direction according to the flow of traffic that the Restriction intends to capture.

c) **Second Location Conditions Group**

- A Second Location Conditions Group can be combined with the Included Location Conditions Group by an 'OR', 'AND' or 'AND NOT' operand.
  - Between the Departing, Crossing and Arriving Location Conditions within this group a global logical operand has to be inserted if necessary. The Operands 'AND THEN' and 'OR' are allowed, but not a combination of these two.
  - Only two Crossing Locations Conditions Cells are available.
- Typical usages of the Second Location Condition group are the following:
  - Linked with an 'OR' to the Included Location Condition group, it represents a single constraint (the Flow Routing) for two different Flows of Traffic (the Included Location Condition group and the Second Location Condition group);
  - Linked with an 'AND' to the Included Location Condition group, it represents Flow conditions that could either not be inserted in the Included Location Condition group due to lack of space, or that needed to be inserted without an indication of sequence (e.g. 'AND Crossing Airspace XYZ' instead of 'AND THEN Crossing Airspace XYZ');
  - Linked with an 'AND NOT' (meaning 'except') to the Included Location Condition group, it represents a constraint of the type 'Only available for', which is implemented as Forbidden (Flow Routing) AND NOT (Second Location Condition group).

d) **Location Conditions Elements Level Range**

- A Level range can be specified for each element of a Crossing Location Condition Cell separately except:
  - If the Cell is the Reference Location;
  - Within any group of Reference Locations where the elements are not all Airspaces, if a vertical limit is defined for any Location, the same vertical limit must be explicitly defined for each of the others;
  - For Crossing Locations (DCT Segments, Terminal Procedures and Route Portions) originating from an Aerodrome.

  Level range can be expressed as a FL (F + 3 numeric). Additional values GND, UNL, FLR and CEL are allowed. If values FLR or CEL are used, they define an extended Airspace Slice. They can only be used when defining a slice of an existing Airspace i.e. not for Points, Segments, Routes, Airspace Borders, etc.

e) **Reference Location**

- One of the Conditions (all elements within one Cell) must serve as date and time reference for the overall applicability of the Restriction. The Reference Location has this role: the entry into and exit from the Reference Location is where the applicability of the Restriction will apply. In addition, in case Special Dates are used in the basic applicability, the Reference Location is also the reference to determine which country has to be considered.
- If the operand 'OR' is used between the Included Location Condition group and the Second Location Condition group, the Reference Location (including its vertical limits) has to be the same in each group.
- The Restriction's applicability will apply:
  - For Departing Locations: to the E/CTOT;
  - For Crossing Locations of type Point: to the time over the Point;
  - For Crossing Locations of type Airspace, Route Portions, Terminal Procedures, DCT Portions: to the entry time into and exit time from the Airspace, the DCT or the first segment of the Route portion or Terminal Procedure;
  - For Arriving Locations: to the landing time.

f) **Conditions Group**

- This Condition group is composed of Aircraft equipment, Flight properties and Aircraft identification.

- Aircraft equipment - The possible values are:
  - ComNav (Field10a)
  - PBN (Field18)
  - Surveillance (Field 10b)

- Flight properties may include:
  - Flight Status STS/ followed by particular reason for special handling by ATS - In a special events (industrial action, crisis, …) managed by EU Restrictions, flights with certain STS values can be automatically exempted from those Restrictions

- Flight Type Condition element can be:
  - General;
  - Military;
  - Non Scheduled;
  - Scheduled;
  - Other.

  The division here is not related to flight rules (OAT / GAT etc.), but to the operating agency derived from the Item 8b (i.e. 'G' for general, 'M' for military, 'N' for non-scheduled, 'S' for scheduled).
- Flight Plan Source
- Aircraft Classification

  The Aircraft type ID or Aircraft type classification is according to ICAO Doc 8643, which indicates the Aircraft's propulsion system and the kind of aeroplane in general. Wildcards, which group some of the categories below, are allowed.

  Allowed Values:

  A Valid Aircraft ICAO ID or a valid Aircraft type classification or wild card thereof.

  Three characters are used to compose the description of Aircraft type classifications:

First Character	Second Character	Third Character
L = Landplane S = Seaplane A = Amphibian H = Helicopter G = Gyrocopter T = Tilt-wing aircraft	1, 2, 3, 4, 6, 8 or C: representing the number of engines (C for 2 coupled engines driving 1 propeller)	P = Piston Engine T = Turbo Engine J = Jet Engine E = Electric R = Rocket

Table 4: Flight Property Conditions Group - Aircraft type classifications

Examples
L2T = a Landplane with two turboprop engines.
***J = all Jet aircraft.*
Departing: EBBR
AND
*Flight Property: **J*
FORBIDDEN
DURING: H24
Restriction Routing: EBBR DIK 1C

- Aircraft Type - allows users to target or exclude specific aircraft. The IDs of the aircraft are imported from BADA
- Remark(RMK)- Via the remark field in the flight plan, IFPS decides whether the restriction is applicable for a flight plan.

- Aircraft identification

  It is possible to restrict or exclude traffic by using the Aircraft Identification condition.

Note that this feature is not aimed at offering privileges to any AO, and will be used on an ad hoc basis following a reasonable request for such a restriction.

g) **Combination of Conditions**

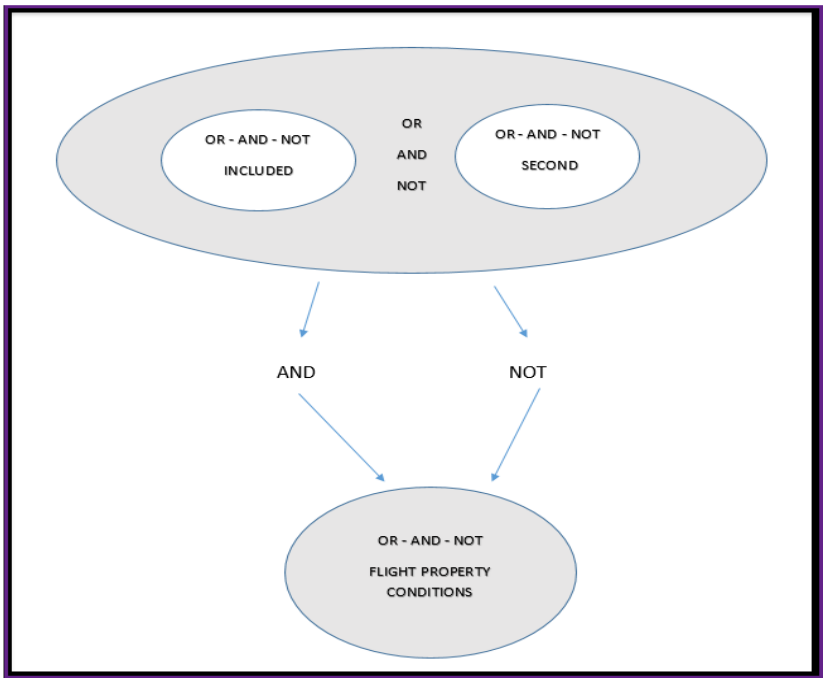


Figure 2: Expression of Combinations and Conditions

- Within one Conditions Cell, several elements can be combined. Each element can carry a FL band. At least one element must be present in the Included Location Conditions Group.
- The three Condition Groups can be combined as follows:
  [(Included Location Conditions Group)
  OR/AND/AND NOT (Second Location Conditions Group)]
  AND/AND NOT [Flight Property Condition Group]

  The different conditions within the included Location Conditions Group are bound as follows:
  [(Departing cell)
  AND THEN (First Crossing cell)
  AND THEN (Second Crossing cell)
  AND THEN (Third Crossing cell)
  AND THEN (Fourth Crossing cell)
  AND THEN (Arriving cell)]

  The different conditions within the Second Location Conditions Group are bound as follows: If the second Location Conditions group is bound by the operand
  OR [(Departing cell)
  AND THEN (Crossing cell)
  AND THEN (First Crossing cell)
  AND THEN (Second Crossing cell)

AND THEN (Arriving cell)]

If the second Location Conditions group is bound by the operand AND/AND NOT
either [(Departing cell)
AND THEN (Crossing cell)
AND THEN (Arriving cell)]
or [(Departing cell) OR (Crossing cell) OR (Arriving cell)]
The different conditions within any cell of the Location Conditions Groups are bound as follows:
[(Element) OR (Element) OR (Element)]

h) **Applicability**

- Overall Applicability
  The overall Applicability of the Restriction is derived from the intersection of the temporality of the Flow Restriction, the Basic Applicability and the Dependent Applicability.
- Basic Applicability
  It is defined based on days of the week and time intervals. It can also contain Special Dates: Holiday-1, Holiday, Holiday+1, Busy Fridays. To determine when a day is Holiday or Busy Friday, the algorithm looks at the country code of the Reference Location and reads the Special Dates defined for the corresponding Country.

  The set of Reference Locations of a Restriction must have a single reference Country, otherwise Special Dates must not be used in the applicability time table. The Basic Applicability can be set to:
  - Yes, meaning the Restriction is applicable during given days and periods;
  - No, meaning the Restriction is applicable all times EXCEPT the given times and periods (“negative applicability”).
- Dependent Applicability
  The Dependent Applicability triggers the period(s) of time when the Restriction is applicable (exists). It can be based on Route Availability or Airspace Activation.

3.2.6 Dependent Applicability based on Route availability

(1) A Route portion and Vertical limits have to be indicated in the Restriction. The route portion can be composed of more than one segment. Dependant applicability base on a ROUTE can be:

- DURING availability: the Restriction exists if the Route Portion is Available.
  For the Restriction model, ONE level OPEN along the route segment(s) within the vertical limits means that the ROUTE is available.

- OUTSIDE availability: the Restriction exists if the Route Portion is not available.

For the Restriction model, OUTSIDE AVAILABILITY means when ALL levels within the vertical limits are CLOSED in AT LEAST one of the route segments.

3.2.7 Dependent Applicability based on Airspace Activation

(1) The Dependent Applicability triggers the period(s) of time and possible vertical limits with or without vertical definitions.

(2) Airspace Activation options

- Dependent Vertical limits: the flag indicates whether the dependency also refers to the active vertical limits. However this will be only effective if the RL is an Airspace, a point or a group of points
- Extended Vertical limits: is read-only information, derived by the system. It indicates that a temporary extension of RSA vertical limits impacts (part of) the Overall Applicability. It is only applicable if "Dependent Vertical Limits" = 'YES'.
- The vertical limits will be derived by the system from the RSA Activation.

- FUA: (RSA in Dependant Applicability is also the Reference Location) (see chapter 3.7 and 4.4)
  - A FUA restriction restricts flights from penetrating RL which is an RSA
  - Airspace Dependent Applicability is Mandatory
  - FUA Default Active : indicates whether the FUA Restriction is considered default active for AUP/UUP processing
  - Dependant applicability based on an Airspace can be :
    - DURING Airspace Activation: the Restriction applies for traffic calculated inside the RSA during the times and within the FL Range where the RSA is activated.
    - OUTSIDE Airspace Activation: the Restriction applies for traffic calculated inside the RSA during the times and within the FL Range where the RSA is NOT activated.

- FUA/RAD:
  - A FUA/RAD Restriction is a "Traffic Flow Restriction managed via AUP (see chapter 4.5).
  - Airspace Dependent Applicability is Mandatory
  - FUA Default Active : indicates whether the FUA Restriction is considered default active for AUP/UUP processing
  - Dependant applicability based on an Airspace can be :
    - DURING Airspace Activation: the Restriction applies for traffic calculated inside the RSA during the times and within the FL Range where the RSA is activated.
    - OUTSIDE Airspace Activation: the Restriction applies for traffic calculated inside the RSA during the times and within the FL Range where the RSA is NOT activated.

- Non FUA: (RSA in Dependant Applicability is not the Reference Location)
  - Airspace Dependent Applicability is Optional.
  - Dependant applicability based on an Airspace can be:
    - DURING ACTIVATION: the Restriction is active if the Airspace is Activated.

      For the RS model, an Airspace ACTIVATED for AT LEAST ONE LEVEL within the vertical limits means that the Airspace IS ACTIVATED, and the Restriction is applicable.
    - OUTSIDE ACTIVATION: the Restriction is active if the Airspace is not Activated.

      For the RS model, OUTSIDE ACTIVATION means when NO LEVEL within the vertical limits is activated.

Example:
RSA Vertical Limits = [GND, FL245]
RSA Activation = 08:00 -12:00 [GND, FL195]
Outside Airspace Activation means the Restriction is applicable for traffic entering the RSA
00:00 - 08:00 at a calculated Level between [GND, FL245]
08:00 - 12:00 at a calculated Level between [195, FL245]
12:00 - 00:00 at a calculated Level between [GND, FL245]

3.2.8 Deferred Applicability

(1) Restrictions with dependent applicability apply at IFPS for traffic calculated at the Restriction Reference Location exactly at the time given by the dependent applicability.

(2) For mandatory Traffic Flow Restrictions, this sometimes creates a conflict in IFPS: the original routing filed in the flight plan is invalidated by the RAD mandatory Restriction, but updating the flight plan to follow the mandated route gives a Route availability problem (Route not available). So for a period of time (usually a few minutes) both routings are invalidated by IFPS. This often happens when the mandatory Route is a CDR (not H24 available).

(3) To overcome this problem, two buffers are available in Traffic Flow Restriction Dependent Applicability:

- Offset Start (Minutes): duration (+ 90 min to - 90 min). This is the time required to add or subtract to the start of the dependent applicability.
- Offset End (Minutes): duration (+ 90 min to - 90 min). This is the time required to add or subtract to the end of the dependent applicability.

  The two buffers are independent, they can have different values.

(4) These values depend on the speed and performance of aircraft. For this reason, they have to be determined in coordination with the FMP, who knows the most common traffic in the area of conflict.

(5) FRA restriction is only active when the complete trajectory within the FRA fully overlaps the time applicability period, while for a non-FRA DCT the restriction is active when these periods partially overlap (this to allow switches between FRA

and non-FRA restrictions without having both or neither applying to the same segment).

3.3 RAD

(1) The RAD basic principles, document structure, restrictions/rules structure, publication and all other features are described in ERNIP Part 1, Chapter 8.

3.3.1 Purpose

(1) The RAD is 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.

(2) The RAD is also an Air Traffic Flow and Capacity Management (ATFCM) tool that is designed as a sole-source flight-planning document, which integrates both structural and ATFCM requirements, geographically and vertically.

3.3.2 Creation

(1) RAD traffic flow rules are created in CACD by the NM RAD Team based on proper request by relevant State / FAB / ANSP National RAD Coordinator (NRC). The whole process of RAD creation is defined by ERNIP Part 4.

(2) To classify the strength of the requirements in regards to the RAD, the following conventions are used in restrictions definition:

- The word "**shall**" denotes a mandatory requirement and is used only in RAD traffic flow rule definition;
- The word "**should**" denotes a preferred requirement and is used only in Operational Goal definition.
  The words "**may**" - an optional requirement and "**will**" - a statement of intent to implement a requirement are <u>not</u> used in RAD.

3.3.3 Publication

(1) RAD traffic flow rules are published as xls file via NOP RAD Portal, RAD Home in accordance of ERNIP Part 1, Chapter 8 and ERNIP Part 4 provisions. The xls file of any RAD Annex is the only official publication containing the correct information to be used in flight planning.

(2) RAD Annex 4 - Special Events and Crisis contains rules of temporary nature. For the establishment of temporary areas (e.g. military exercise/activity) for which a temporary rules are required, those shall be published in RAD Annex 4 dedicated to the specific event or RAD increment file.

(3) RAD traffic flow rules as all other AURA rules/ restrictions / limitations are also available via B2B in AIXM format. Due to NM system capabilities to incorporate the structure of the RAD not all data available in xls files is available via B2B.

3.3.4 Usage

(1) RAD traffic flow rules are used by IFPS to validate/invalidate Flight Plans and by the Path Finder to generate valid routes.

3.3.4.2 Specificities in Restriction Types

3.3.4.2.1 Restriction Design

a) **Restricted Object**

- It specifies the geographic location where the restriction is applied.
- It is a mandatory section of each restriction and uses flow elements.

b) **Condition / Utilization**

- It is a mandatory section of each restriction and uses flow elements, level expressions, time conditions and special terms to specify parameters, which flights have to match in order to be subject to the restriction.

c) **Time Applicability**

- For each RAD traffic flow rule, the period of applicability has to be defined.

3.3.4.2.2 Logical Operators

a) **Logical Conjunction (AND operator)**

- The trajectory has to fulfil all expressions of the condition in order to be subject to the restriction.
- If the condition consists of more than one expression, represented by separate lines in the document, a logical conjunction is connecting these expressions.
- If at least one expression of the condition is not fulfilled by the trajectory, the restriction is not applicable to it.

AIRWAY	FROM	TO	Utilization
UN869	LERGA	OLRAK	Not available for traffic Above FL275 DEP LSGG With ARR LFBO

Table 5: Example of RAD Logical Conjunction (AND operator)

Explanation: The restricted object UN869 LERGA - OLRAK cannot be used by flights which depart from airport LSGG **AND** have LFBO as arrival airport **AND** are using the restricted object above FL275.

b) **Logical Disjunction (OR operator)**

- The trajectory needs to fulfil only one expression of the condition in order to be subject to the restriction.
- If the condition consists of more than one expression, represented by separate paragraphs in the document, a logical disjunction is connecting the respective paragraphs. The beginning of a paragraph is either marked by numbers (1, 2, 3, …) with sub section in letters (a, b, c …).
- The restriction is also applicable if more than one expression is fulfilled by the trajectory.

AIRWAY	FROM	TO	Utilization

UL976	OBATO	RONAX	Not available for traffic 1. ARR LFPG 2. Via MMD 3. Via CHW

Table 6: Example of RAD Logical Conjunction (OR operator)

Explanation: The restricted object UL976 OBATO - RONAX cannot be used by flights which have LFPG as arrival airport **OR** by flights crossing the significant point MMD **OR** by flights crossing the significant point CHW.

c) **Logical Negation (NOT operator)**

- In order to exclude a particular flow element from a larger set of flow elements (e.g. exclude one airport from an airport group), the term "except" can be used. This term refers to a logical negation of the status of the particular flow element.

AIRWAY	FROM	TO	Utilization
UL976	OBATO	RONAX	Not available for traffic ARR PARIS_GROUP except ARR LFPO

Table 7: Example of RAD Logical Negation (NOT operator)

Explanation: The restricted object UL976 OBATO - RONAX can **NOT** be used by flights landing at an airport belonging to the Paris Group except if the arrival airport is LFPO.

- The use of a logical negation can also change the restriction type for the particular traffic flow. In case a traffic flow is excluded from a "Not Available" restriction, it means that the restricted object is available for the specific traffic flow. In case a traffic flow is excluded from an "Only Available" restriction, it means that the restricted object is not available for the specific traffic flow. In case a traffic flow is excluded from a "Compulsory" restriction, it means that the restricted object is not mandatory to be used by the specific traffic flow.

3.3.4.2.3 Design of restriction conditions

a) **Lines**

- Every line of the condition represents a separate expression of the restriction. Each line is connected by a logical conjunction (AND) to other lines.
- If a line consists of a flow element, the trajectory has to contain this flow element in order to fulfil this expression.
- If a line contains an expression related to flight properties, the particular aircraft for which the trajectory is generated has to fulfil this expression.
- If a line contains a time or level condition, without any reference to a specific flow element, the reference location where the time or level condition is validated is the restricted object.
- If a line contains a time or level condition, with direct reference to a specific flow element, the reference location where the time or level condition is validated is not the restricted object but the explicitly

mentioned flow element condition. To properly indicate the reference location, the term AT can be used.

- If the time or level condition is fulfilled by the trajectory at the corresponding reference location, the condition is fulfilled.

Point or Airspace	Utilization
SPL	Not available for traffic DEP LDDU Via PEVAL Above FL285

Table 8: Example of RAD Line Expression

Explanation: The level condition is specified in a single line. In this case, the condition refers to the restricted object SPL. Hence, the significant point SPL is not available above FL285 if the flight is departing from airport LDDU and crossing significant point PEVAL at any level.

Point or Airspace	Utilization
SPL	Not available for traffic DEP LDDU Above FL285 at PEVAL

Table 9: Example of RAD Line Expression

Explanation: The level condition is specified in the same line as the flow element PEVAL. In this case, the condition refers to the flow element PEVAL. Hence, the restricted object SPL is not available at any altitude if the flight is departing from airport LDDU and crossing significant point PEVAL above FL285.

b) **Paragraphs**

- If a condition is enumerated i.e. contains more than one paragraph, a trajectory only has to fulfil one of these paragraphs in order to be affected by the restriction.
- The paragraphs are connected by a logical disjunction (OR) to each other. Within a paragraph, all expressions are connected by a logical conjunction (AND) as defined above. The beginning of a paragraph is marked by numbers (1, 2, 3, …) with sub section in letters (a, b, c …).

Point or Airspace	Utilization
SULUS	Not available for traffic 1. DEP EDDF with ARR EDDN 2. DEP EDDN via SULUS L/UL604

Table 10: Example of RAD Paragraphs

Explanation: The restricted object SULUS cannot be used by flights with departure airport EDDF **AND** arrival airport EDDN **OR** flights with departure airport EDDN **AND** via the ATS routes L604 / UL604 after significant point SULUS.

- If further level of detail is required within a paragraph, the numeration of the lower level should be different from the numeration of the higher level.

AIRWAY	FROM	TO	Utilization
UL607	MOMUK	XEBIX	Not available for traffic Via 1. Y740 TIRUL 2. N/UN871 KOGOL Except a. ARR LOWS b. DEP LFST with ARR LOWW

Table 11: Example of RAD Paragraphs

Explanation: The restricted object UL607 MOMUK - XEBIX is not available for flights via the ATS routes Y740 to TIRUL **OR** flights via N871 / UN871 to KOGOL except if the arrival airport is LOWS or the departure airport is LFST with an arrival to LOWW.

c) **Separation of flow elements by slash or comma**

- If an expression of the condition contains more than one flow element, a slash or comma can be used to separate between the individual flow elements.
- This separator represents a logical disjunction (OR) which means that the trajectory only has to contain one of these flow elements in order to fulfil this expression.

Point or Airspace	Utilization
ALIVO / BUSET / GORPA / ROKSA / SABAD	Not available for traffic ARR EDDM, EDM*, LOWI, LOWL, LOWS, LOWW Above FL345

Table 12: Example of RAD flow elements separation by slash or comma

Explanation: All restricted objects (ALIVO **OR** BUSET **OR** GORPA **OR** ROKSA **OR** SABAD) are not available above FL345 if flights are arriving at airport EDDM **OR** airports of which the location indicator starts with the letters EDM **OR** arriving at airports LOWI **OR** LOWL **OR** LOWS **OR** LOWW.

d) **Routes in square brackets**

- The square bracket itself does not represent a logical operator.

Point or Airspace	Utilization
ASTOS	Not available for traffic DEP EKCH Except Via ASTOS [Z490 KEMAX] / [T408 OTVEB] / [Q44 IDPAL]

Table 13: Example of RAD square brackets usage

Explanation: The condition contains three routes of which one has to be used by the trajectory in order to fulfil this expression of the condition. Flights from airport EKCH are not allowed to cross significant point ASTOS except if the trajectory contains the route ASTOS Z490 KEMAX **OR** ASTOS T408 OTVEB **OR** ASTOS Q44 IDPAL.

e) **Sequence of flow elements**

- The sequence of flow elements in lines from left to right or from top to bottom does not reflect the sequence in which a trajectory has to cross these flow elements.
- In order to make the sequence clear, additional terms like “FROM”, “TO”, “AND THEN”, “AFTER” or “BEFORE” shall be used to indicate the direction of the flight. Especially, conditions which are only based on significant points can be fulfilled in two (both) directions.

f) **Reference Location**

- The reference location is a geographic reference for the applicability of the RAD traffic flow rule or for validation of specific condition expressions which do not apply to the complete trajectory.
- A reference location is explicitly mentioned if a RAD traffic flow rule is only applicable within a specific region. Especially for city-pair specific restrictions, the differentiation of the restriction’s applicability for different regions has significant influence on the various traffic flows (e.g. city-pair level capping restrictions).

FROM (ADEP)	Crossing Airspace	TO (ADES)	Condition	FL Capping
(EDDW, FRIESLAND_GROUP)	ED EH	(EDDR/FH/FM/FV/RY/RZ, ETAR)	WRB	Not above FL245

Table 14: Example of RAD reference location

Explanation: The maximum level on the city-pair from (EDDW, FRIESLAND_GROUP)to (EDDR/FH/FM/FV/RY/RZ, ETAR)is FL245 if the route is planned via Germany or the Netherlands and if via WRB.

- Reference locations are also used to specify conditions based on level expressions.

3.3.4.3 Specificities related to Flow Elements

3.3.4.3.1 Airport

(1) In the RAD document, an airport can be indicated as follows:

Explicitly by naming the ICAO location indicator, OR

Implicitly by:

a) <u>Airport Area / Group:</u>

The airport is part of an airport area / group as specified in RAD Annex 1 “Area Definitions”.

b) <u>Aggregation by location indicator:</u>

The ICAO location indicator of the referred airport starts with a particular sequence of letters. The positions which can have variable values are marked by (*) asterisks, e.g., EH** refers to all airports of which the ICAO location indicator starts with the letter E followed by letter H. Here, the third and fourth position of the location indicator can have any value.

*Note: The aerodrome aggregations defined this way do not necessarily cover all airports located in a country, e.g., ED** does not refer to all airports located in Germany as there are airports with location indicators starting with ET located in this country too.*

c) Reference to geographic boundaries:

The airport is located within the projection at ground level of the area defined by geographic boundaries. These boundaries can be defined by State borders, FIR borders or the borders of operational airspaces such as ACC / UAC. If an airspace volume which has different lateral boundaries depending on the level shall be used, it must be specified which lateral projection at which level is used.

3.3.4.3.2 Random Route

(1) Some restrictions refer to random routes, which are not covered, by ATS routes or a DCT connection published in RAD Annex 3B.

(2) The term "random route" refers to a connection of two significant points which might have intermediate significant points at the same time. A random route is hence not necessarily a great circle connection between two significant points. As it can have intermediate significant points, a random route consists of several DCT connections in sequence.

(3) When using random routes in a flight plan, the general rules of the respective airspace, in which the random route is used, have to be considered. This refers to the flight level allocation (ODD / EVEN rules) and the vertical limits of the respective airspace.

(4) At the same time, the restrictions on DCT usage as specified in RAD Annex 3B have to be considered for random routes, too.

Point or Airspace	Utilization
BEPAN	Not available for traffic 1. DEP EIDW Via BANBA - CRK 2. Via STU This traffic shall file PESIT - BAKUR

Table 15: Example of RAD Random Route

Explanation: Flights departing from EIDW are not allowed to fly via BEPAN if using any route from significant point BANBA to significant point CRK. The connection from BANBA to CRK may be a great circle connection, which is equal to the DCT (if this is available due to the general DCT rules of the respective airspace). It is also possible to cross any intermediate significant point between BANBA and CRK, which is defined as a random route between these significant points (considering the general DCT rules or other restrictions on intermediate significant points).

3.3.4.3.3 SID and STAR

(1) SID and STAR are routes connecting airports and significant points. Such routes are also referred to as "Terminal Procedures". The significant point of the SID or the STAR that is used to connect an airport with the ATS route network are referred to as "Connecting Point" of the respective aerodrome. That point can be

end of SID, beginning of STAR or any significant point of the terminal procedure (if differently not specified).

(2) In addition to published SIDs and STARs, airports and the routes can also be connected by a DCT. The rules defining the availability of additional Connecting Points, which can be reached by DCT, are also defined in the RAD.

3.3.4.3.4 Airspace

a) **General Issues**

- If airspace is mentioned as a Flow Element then the penetration of it is either forbidden or mandatory at the specified level range.
- The point where the lateral or vertical airspace boundary is crossed first is referred to as entry point.
- The point where the lateral or vertical boundary (wall) is crossed second is referred to as exit point.
- Entry and exit points must not necessarily be published significant points i.e. they can be any geographical coordinate of the trajectory.
- Entry and exit points must not necessarily be crossed at the same level.

b) **Departure Airspace**

- A trajectory complies with a "departure airspace" condition if the departure airport is located within the projection at ground level of the respective airspace. Hence, the lower vertical limit of the departure airspace must not necessarily be GND level.

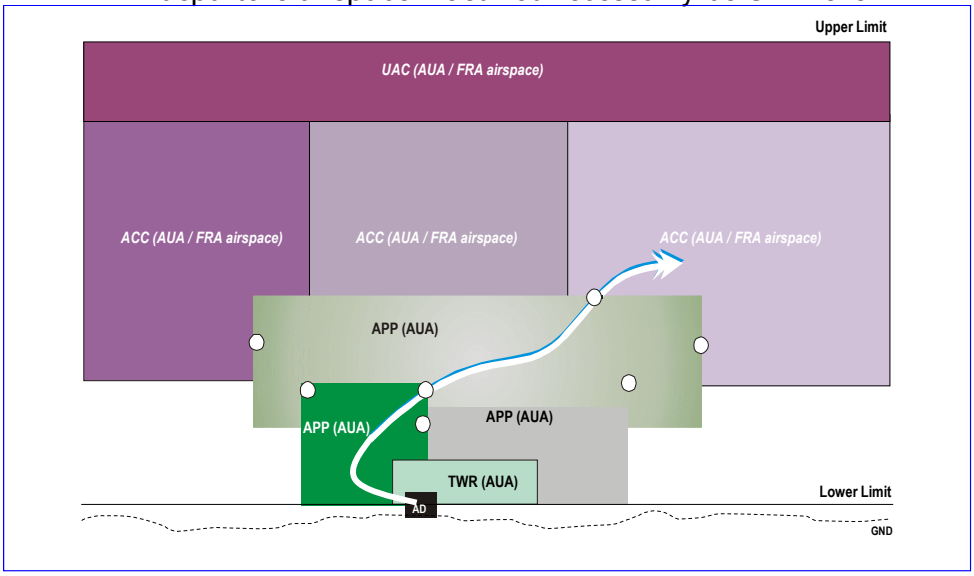


Figure 3: Exemplary trajectory which fulfils a "departure airspace" condition

c) **Arrival Airspace**

- A trajectory complies with an "arrival airspace" condition if the arrival airport is located within the projection at ground level of the respective airspace. Hence, the lower vertical limit of the arrival airspace must not necessarily be GND level.

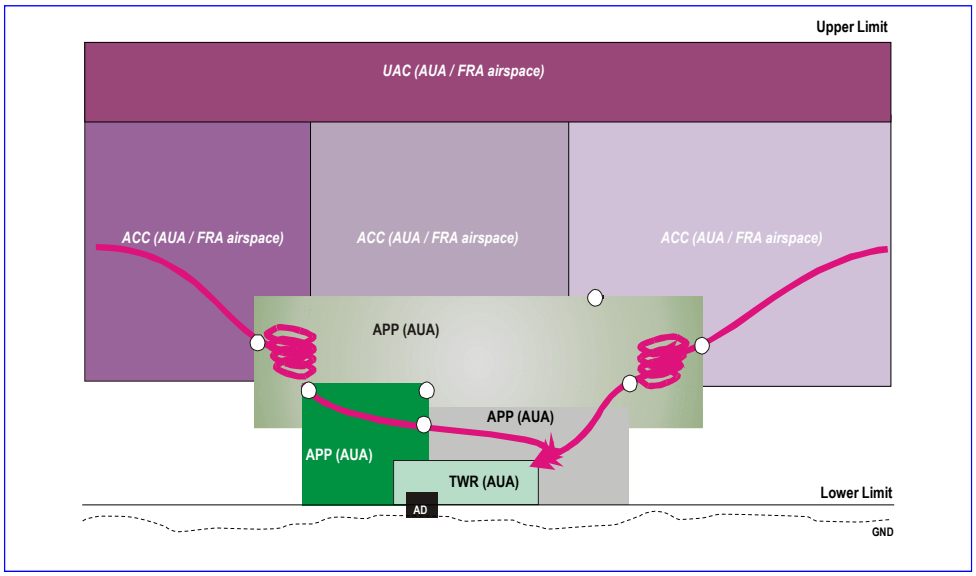


Figure 4: Exemplary trajectory which fulfils a "arrival airspace" condition

d) Overfly Airspace

- A trajectory complies with an "Overfly airspace" condition if at least one portion of the trajectory is located within the volume of the respective airspace and the respective airspace is not a departure or arrival airspace of the particular flight.
- If the flight is departing from or landing in the volume of the respective airspace, the "Overfly airspace" condition is not fulfilled and the flight is subjected to fulfil the "Via Airspace" condition.

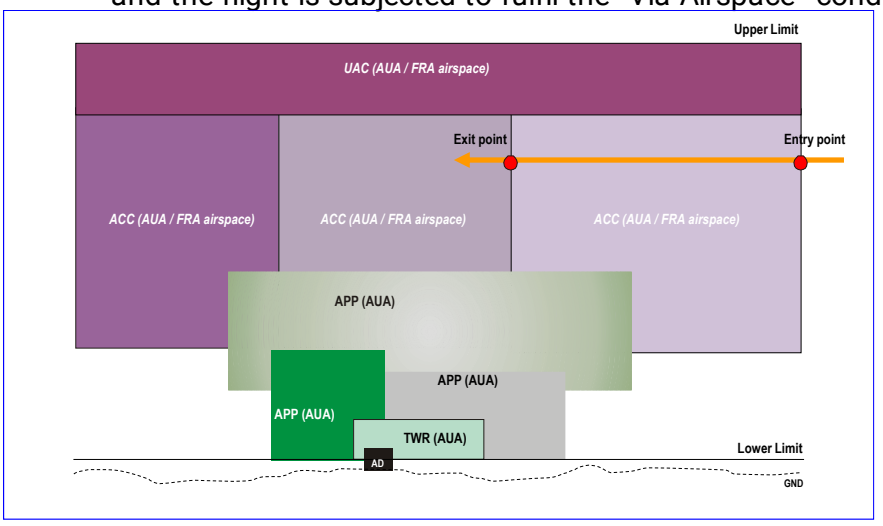


Figure 5: Exemplary trajectory which fulfils an "Overfly airspace" condition constant level with lateral entry and exit

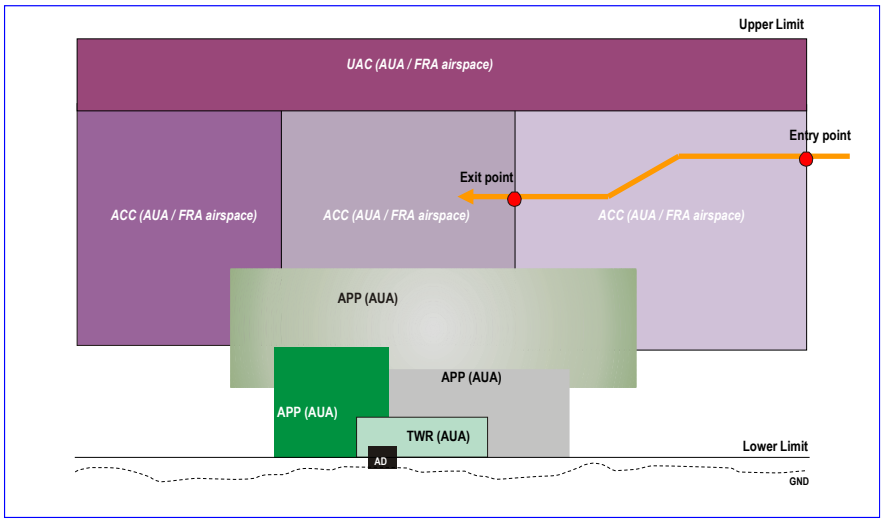


Figure 6: Exemplary trajectory which fulfils an "Overfly airspace" condition with intermediate descent with lateral entry and exit

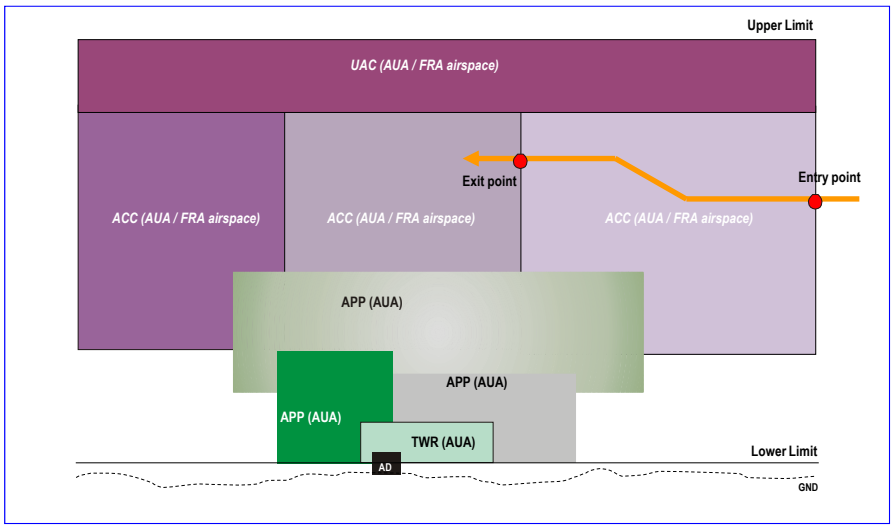


Figure 7: Exemplary trajectory which fulfils an "Overfly airspace" condition with intermediate climb with lateral entry and exit

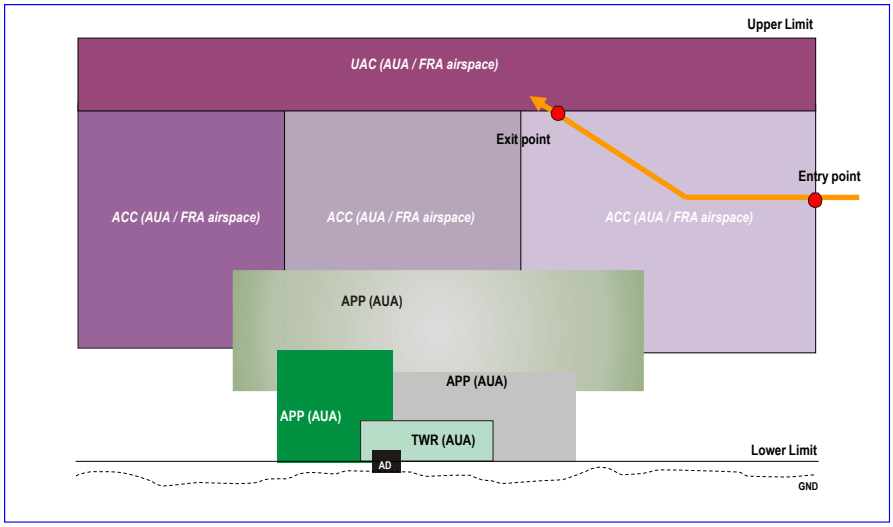


Figure 8: Exemplary trajectory which fulfils an "Overfly airspace" condition with lateral entry and vertical exit

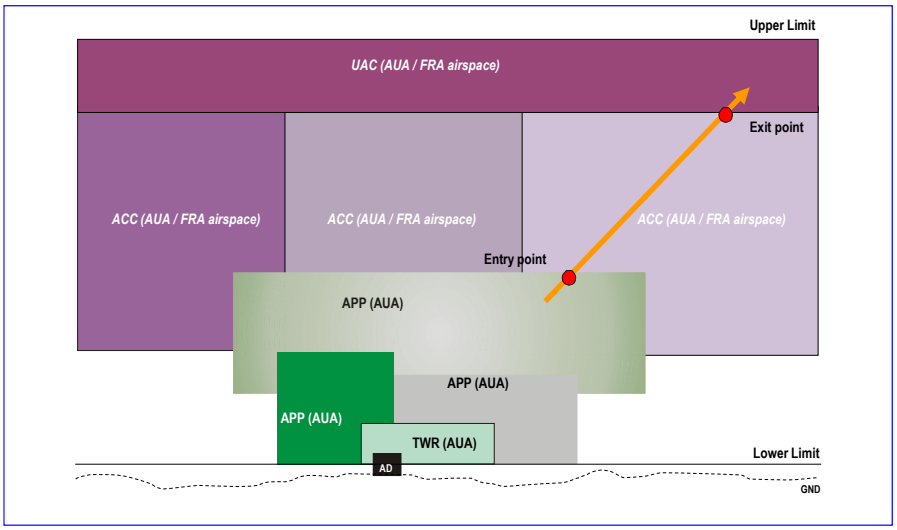


Figure 9: Exemplary trajectories which fulfils a "Overfly airspace" condition with vertical entry and vertical exit

e) **Crossing Airspace**

- A trajectory complies with a "Crossing airspace" condition if at least one portion of the trajectory is located within the volume of the respective airspace or the respective airspace is a departure or arrival airspace.
- The trajectory can completely be located within the volume of the respective airspace. The trajectory can also enter or exit the respective airspace by crossing at least one lateral or vertical airspace boundary.
- Due to this extensive definition, all trajectories, which fulfil a "Departure airspace", "Arrival airspace" or "Overfly airspace" condition, also fulfil the "Via airspace" condition. This conclusion is however not invertible.

f) **Within Airspace**

- The term "Within Airspace" is used as reference to the geographical location where a RFL condition is applied to. The RFL must necessarily be located between the lower and the upper vertical limited of the referred airspace volume.

3.3.4.4 Specificities related to the Vertical Profile

3.3.4.4.1 General Level conditions

a) **General Issues**

- For all RAD traffic flow rules, it must be specified at which location a condition with reference to level has to be evaluated. The location can be a single published significant point or a coordinate along the trajectory as well as a route segment (ATS route, DCT, SID or STAR procedure) or an airspace volume, which is crossed by the trajectory.
- If the level condition refers to more than one point in space (e.g. level condition based on a route segment or an airspace volume), all points of the specific flow element have to fulfil the level condition at the same time.

AIRWAY	FROM	TO	Utilization
M189	LYD	HASTY	Not available for traffic DEP London Group Above FL175

Table 16: Example of RAD Level Conditions

Explanation: Flights departing from any airport belonging to the London Group have to fulfil the level condition at any point along the restricted object M189 LYD - HASTY. This means, the trajectory has to be planned in a way that the beginning of the restricted object (significant point LYD) and the end of it (significant point HASTY) as well as any intermediate point (published significant point or geographical coordinates) are not crossed above FL175. Climbing to a higher level after LYD and descending back to the original level before reaching HASTY is not allowed.
NOTE: Currently NM system checks level only at segment entry point. To achieve operational goal/s of the restriction, combination of conditions might be used.

- The RAD mainly uses either VFR FL expression or number representing the layer / intermediate level between IFR FL, to define level ranges (e.g. above FL195). The objective is to be distinct between the level range and which discrete IFR FLs it includes.

b) **At Level**

- A trajectory fulfils an "at level" condition if the level of the trajectory is equal to the specified level of the condition at a defined location in space.

c) **Above Level**

- A trajectory fulfils an "above level" condition if the level of the trajectory is greater than (not including) the specified level of the condition at a defined location in space.

d) **Below Level**

- A trajectory fulfils a "below level" condition if the level of the trajectory is lower than (not including) the specified level of the condition at a defined location in space.

e) **Between Level**

- A trajectory fulfils a "between levels" condition if the level of the trajectory is at the same time greater than (not including) the lower level limit of the condition and lower than (not including) the upper level limit of the level condition at a defined location in space.

3.3.4.4.2 Requested Flight Level

(1) In accordance with ICAO Doc 8400 PANS-ABC the only abbreviation with "Flight Level" term used is the FL while in accordance with ICAO Doc 4444 PANS-ATM in the flight plan route description (e.g. ICAO FPL ITEM15) the planned cruising level for the first or the whole portion of the route to be flown shall be inserted. The cruising level is a level maintained during a significant portion of a flight.

(2) The term Requested FL (RFL) is used for RAD purposes and refers to the actual requested cruising level as specified in the flight plan route description. A flight plan can have a single RFL, which refers to a single requested cruising level that is indicated by the initial speed/level group in route description. A flight plan can also have several RFL, which represent different requested cruising levels at different locations during the flight. Each RFL is indicated by a speed/level group in the flight plan route description, which marks the point where the transition from the previous RFL to the new RFL is commenced. Due to the limited content of route description, the exact length, which is required for the transition from the previous to the new RFL, is not transparently available to all users of the flight plan. Hence, the RAD must consider that the new RFL is not reached at the point where the change of speed/level is indicated but somewhere downstream of the flight path (In accordance with the ICAO Doc 4444 PANS-ATM each point at which either a change of speed and/or level is planned to commence, or a change of ATS route, and/or a change of flight rules is planned shall be indicated in the flight plan route description).

(3) RAD is checked against the IFPS calculated profile. In the climb/descend phase, the profile FL may not be the same as the RFL in the flight plan. Therefore, a flight plan could be invalidated. For that reason, NM systems are capable to distinguish if RAD will be checked against the RFL or calculated FL (RAD owner selects this feature). In the example below, the trajectory calculated by IFPS is presented in red, while the blue trajectory represents “RFL profile” of the same flight. RFL profile is created based on the cruising level as specified in the route description, over the 2D Track of the flight. “RFL profile” indicates cruising level for the portion of the flight, starting with the point where level change is commenced.

(4) In the examples below, “RFL profile” is highlighted in blue and “calculated profile” in red colour.

Example 1: Planned single cruising level for the whole route to be flown

Route (ITEM15): N0450F410 AAAAA L1 BBBBB DCT CCCCC L2 DDDDD

Point	RFL value over Point	Calculated level value over Point
ADEP	FL410	FL0
AAAAA	FL410	FL370
BBBBB	FL410	FL410
CCCCC	FL410	FL410
DDDDD	FL410	FL330
ADES	FL410	FL0

Table 17: Example 1 - RFL value and Calculated level value over point

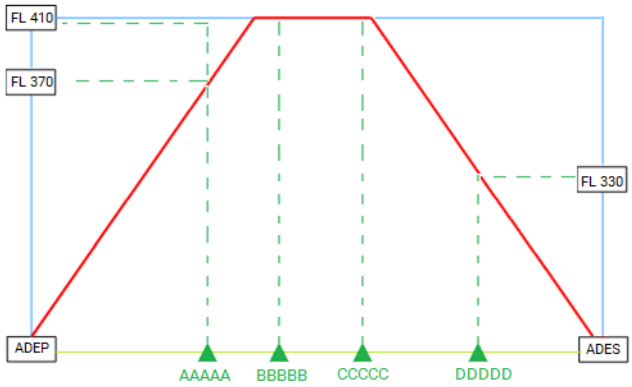


Figure 10: Example 1 - RFL Profile (blue) and Calculated profile (red)

Example 2: Planned cruising level for the first portion or the route to be flown, with later change of level

Route (ITEM15): N0450F290 AAAAA/N0460F390 L1 BBBBB DCT CCCCC/N0380F270 L2 DDDDD

Point	RFL value over Point	Calculated level value over Point
ADEP	FL290	FL0
AAAAA	FL390	FL290
BBBBB	FL390	FL390
CCCCC	FL270	FL390
DDDDD	FL270	FL250
ADES	FL270	FL 0

Table 18: Example 2 - RFL value and Calculated level value over point

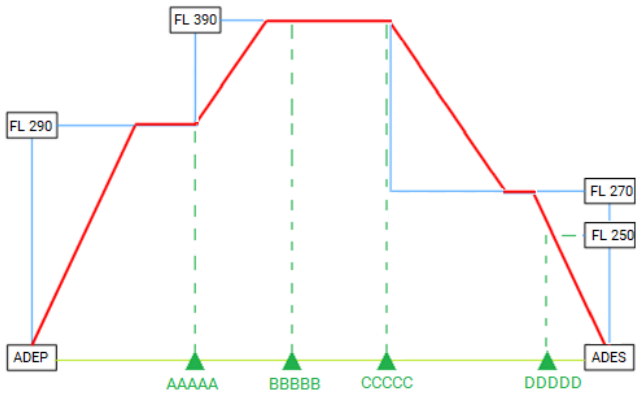


Figure 11: Example 1 - RFL Profile (blue) and Calculated profile (red)

Example 3: Planned cruising level for the first portion or the route to be flown, with later change of level

Route (ITEM15): N0450F390 AAAAA L1 BBBBB DCT CCCCC/N0380F290 L2 DDDDD

Point	RFL value over Point	Calculated level value over Point
ADEP	FL390	FL0
AAAAA	FL390	FL330
BBBBB	FL390	FL390
CCCCC	FL290	FL390
DDDDD	FL290	FL270

ADES	FL290	FL0

Table 19: Example 3 - RFL value and Calculated level value over point

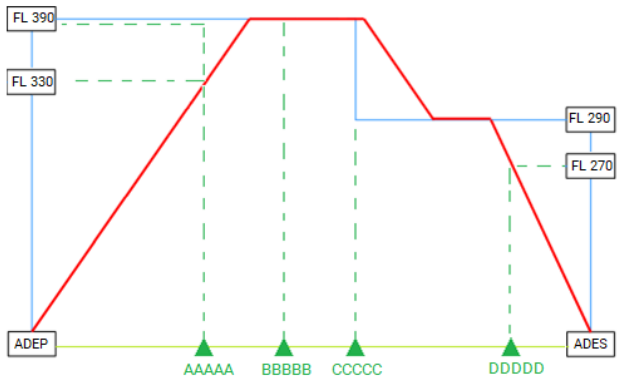


Figure 12: Example 1 - RFL Profile (blue) and Calculated profile (red)

In case, RAD rule is forbidding levels above FL350 over point AAAAA, and if the calculated profile is used in the RAD coding, the flight plan would be acknowledged.

In case, a RAD considers RFL, the flight plan would be rejected by IFPS.

(5) When The RFL is selected, the system takes into account the RFL profile at the reference location. All Requested Flight Level and their changes within the Reference Location shall be considered in processing the restriction - the Calculated Altitude will be considered for all the other conditions of a restriction.

AIRWAY	FROM	TO	Utilization	Time Applicability
L10	DVR	RINTI	Not available for traffic With RFL above FL245 Except DEP EGKK	H24

Table 20: Example 1 of RFL condition in RAD

Explanation: Flights are not allowed to use the restricted object L10 DVR - RINTI if the RFL is above FL245 unless DEP EGKK (RFL condition checked from DVR to RINTI).

If the RFL shall apply at a particular reference location only, the respective flow element has to be defined in the condition of the restriction.

AIRWAY	FROM	TO	Utilization	ATC Unit
UM601	BKP	LESTA	Not available for traffic DEP EGSC With RFL below FL295 in EGTTS99	EGTT

Table 21: Example 2 of RFL condition in RAD

Explanation: Flights from departure airport EGSC are not allowed to use the restricted object UM601 BKP - LESTA if the RFL is less than FL295 in the ATC sector EGTTS99. The RFL may be lower than FL295 before or after the sector EGTTS99.

Point or Airspace	Utilization
S1 (Sector)	NOT AVAILABLE FOR TRAFFIC DEP ADEP WITH RFL ABV FL385 in ACCCTA

Table 22: Example 3 of RFL condition in RAD

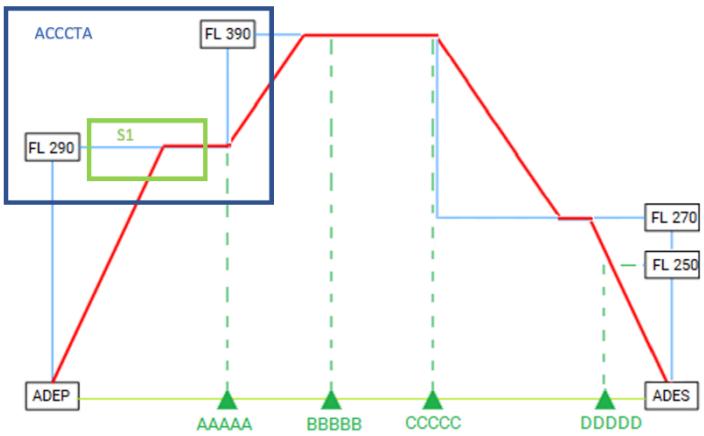


Figure 13: Example 3 of RFL condition in RAD

Explanation: Flight plan will be rejected by IFPS because RFL is above FL385 in ACCCTA (reference location).
Note: Calculated profile and RFL profile are below FL385 in S1, Calculated profile is below FL385 in ACCCTA (exit), but RFL is above FL385 within ACCCTA.

(6) Where the flight plan does not include aircraft operator provided profile information, the IFPS calculated profile may differ from that of the aircraft operator in the climb/descend phase. Due to these differences, IFPS might incorrectly invalidate a flight plan. For this reason, IFPS can manually accept flight plans where the climbing/ descending profile is compliant with the vertical limits of a segment at entry or at exit point.

3.3.4.4.3 Climb and Descent profile

a) **Restriction related to Significant points**

- If a level restriction is related to a significant point, the profile has to be planned in a way that this restriction is fulfilled when reaching the respective significant point (or even earlier).
- After having passed the significant point, this level restriction is not applicable anymore.

b) **Restriction related to ATS routes / DCTs**

- An ATS route portion or a DCT segment are considered as single restriction routing elements when it comes to defining restrictions on the vertical profile. The ATS route is split into segments when processed. The level restriction applies to all the sub-segments of a restricted ATS route portion in the same way.
- If a level restriction is related to an ATS route portion or a DCT segment, the profile has to be planned in a way that this restriction is fulfilled when reaching the first significant point of the restricted ATS route portion / DCT segment (or even earlier). In case of flow

routing element, conditions are checked at the first point of the route, while in case of the reference location at the first and last point of the route.

- Along the restricted ATS route portion / DCT segment, the restriction has to be fulfilled until the last significant point of the restricted ATS route portion / DCT segment is reached.
- After having passed the last significant point of the restricted ATS route portion / DCT segment, the level restriction is not applicable anymore, if level condition are checked at the reference location.
- A trajectory complies with an ATS route or a DCT level condition if it is:
  - cruising; and/or
  - climbing or descending:
    - before/at the ATS route / DCT start significant point; and
    - after/at the ATS route / DCT end significant point; and
    - inside ATS route / DCT vertical limits.

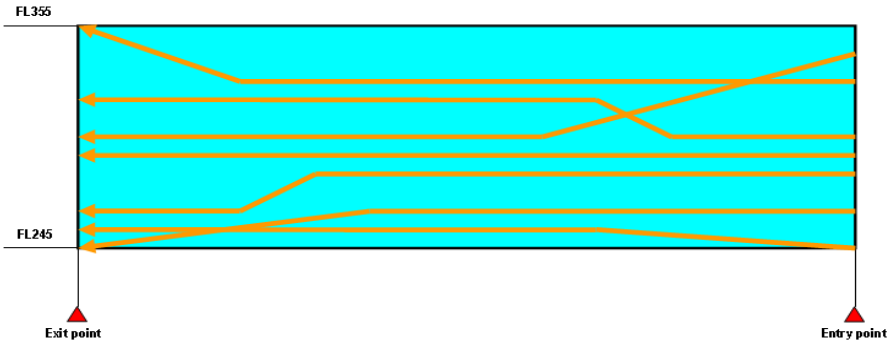


Figure 14: Exemplary trajectory which fulfils a "ATS route / DCT" level condition

- A trajectory does not comply with an ATS route or a DCT level condition if the flight is climbing above or descending below the restricted level range between the start and end significant point of the restricted ATS route portion / DCT segment.

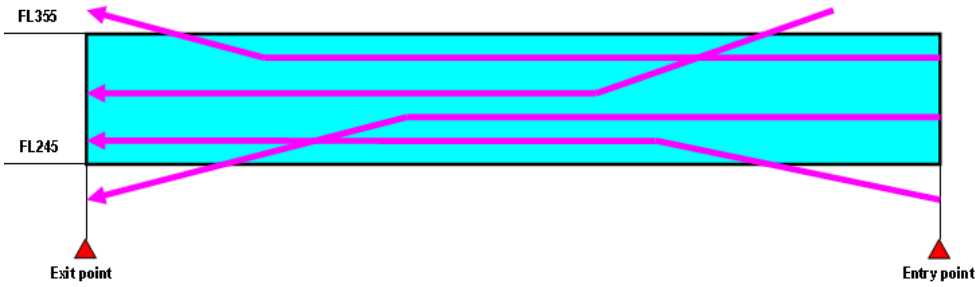


Figure 15: Exemplary trajectory which does not fulfil a "ATS route / DCT" level condition

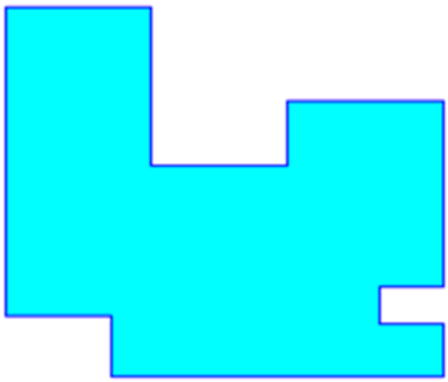
NOTE: Currently NM system checks level only at segment entry point. To achieve operational goal/s of the restriction, combination of conditions might be used.

c) Restriction related to Airspace

- If a level restriction is related to an airspace volume (defined as the reference location), the profile has to be planned in a way that this restriction is fulfilled when the entry point of the respective airspace is reached (or even earlier).

- While within the airspace volume, the restriction has to be fulfilled until the exit point of the airspace is reached.
- After having passed the exit point of the airspace, the level restriction is not applicable anymore.
- A separate level range is specified per sub-element of the Flow Element.
- The level range is expressed as Flight Level, with GND and UNL also being accepted values. Additionally when the level range relates to an airspace volume for system purposes the ceiling and floor of the airspace can serve as bounding level expression.
- Level ranges must be an either subset of the vertical dimension when attached to Flow Element like ATS route / DCT segments, SIDs, STARs or can be fully inside or outside when attached to Airspace volumes.
- Conceptually airspace slices conform to the following principles:

Airspace Vertical Cross Section

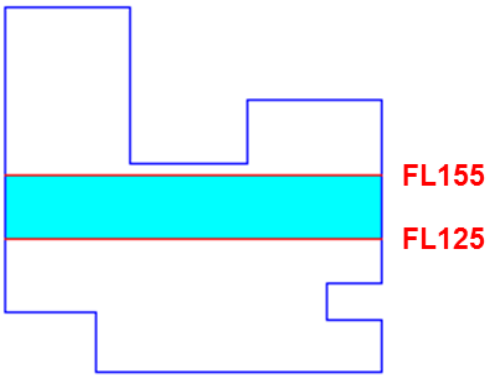


No Vertical Limits

A trajectory complies with an Airspace Condition or Flow Routing Element without vertical limits if it penetrates:

The volume of the airspace.

Airspace Vertical Cross Section

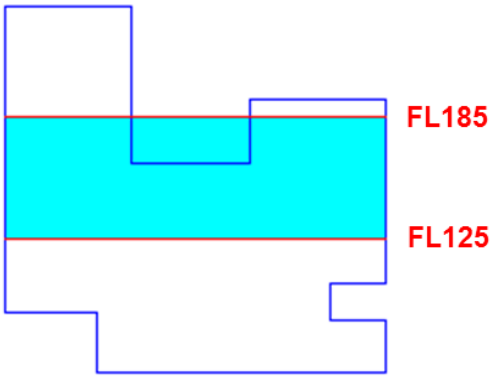


Vertical Limits FL125 / FL155

A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection and the lower and upper numerical bound of the explicitly defined vertical limits.

Airspace Vertical Cross Section

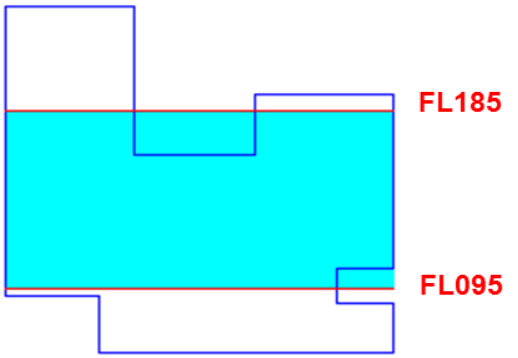


Vertical Limits FL125 / FL185

A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection and the lower and upper numerical bound of the explicitly defined vertical limits even if this volume is actually no part of the original airspace.

Airspace Vertical Cross Section

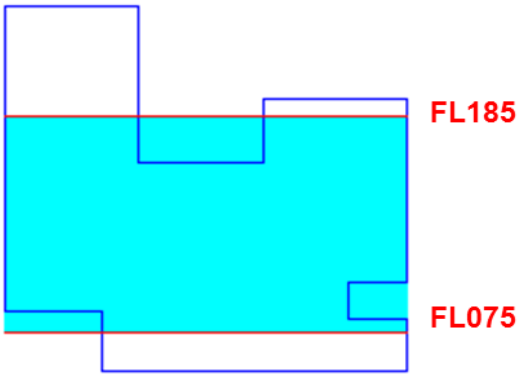


Vertical Limits FL095 / FL185

A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection and the lower and upper numerical bound of the explicitly defined vertical limits even if this volume is actually no part of the original airspace.

Airspace Vertical Cross Section

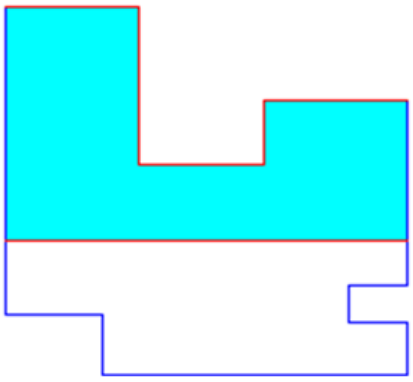


Vertical Limits FL075 / FL185

A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection and the lower and upper numerical bound of the explicitly defined vertical limits even if this volume is actually no part of the original airspace.

Airspace Vertical Cross Section

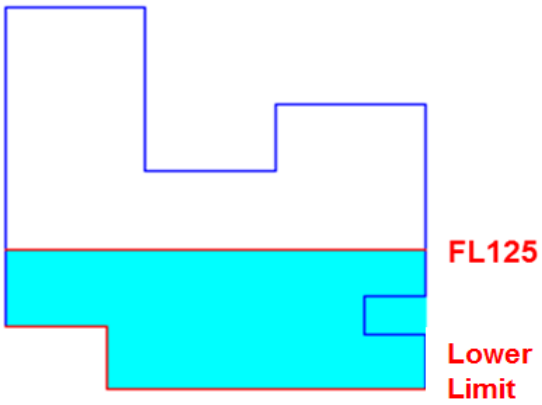


Vertical Limits: FL125 / Upper Limit

A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection and the lower explicitly defined numerical bound and the upper limit of the airspace.

Airspace Vertical Cross Section

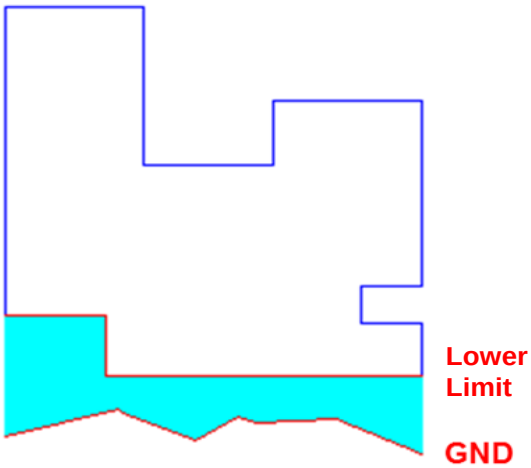


Vertical Limits: Lower Limit / FL125

A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection, the lower limit of the airspace and the upper explicitly defined numerical bound even if this volume is actually no part of the original airspace.

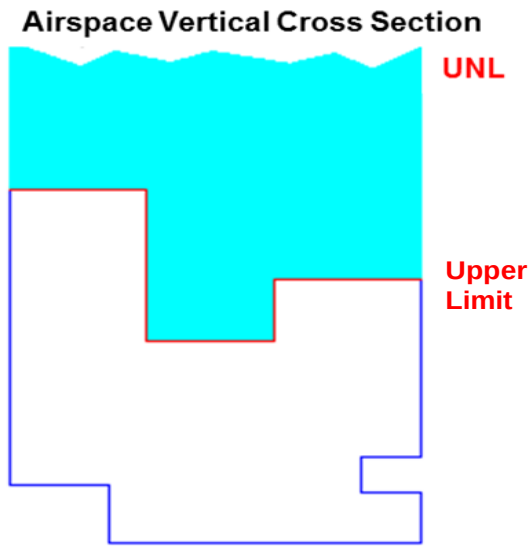
Airspace Vertical Cross Section



Vertical Limits: GND / Lower Limit

A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection, the Ground and the lower limit of the airspace. This construct is the equivalent of "Flying underneath".



A trajectory complies with an Airspace Condition or Flow Routing Element with vertical limits if it penetrates:

The volume created from the airspace's ground projection, the upper limit of the airspace and any level above. This construct is the equivalent of "Flying above".

Figure 16: Airspace Vertical Cross Section

d) **SID / STAR**

- A level range attached to a portion of a SID or STAR is valid for the complete portion: for a SID from the aerodrome to the connecting point and for a STAR from the connecting point to the aerodrome.

3.3.4.5 Specificities related to Time Conditions

3.3.4.5.1 Time Applicability

(1) The time of applicability is specified for each RAD traffic flow rule. The reference location for this time period is the restricted object of the restriction, unless otherwise specified.

(2) If the restricted object of the restriction is a DCT segment, and none of the points is particularly defined as the reference location, then the time applicability (occupancy) is measured at both points of the DCT segment.

AIRWAY	FROM	TO	Utilization	Time Applicability
UL186	HON	BIG	Not available for traffic DEP EGNX	07:00..16:00

Table 23: Example of RAD ATS route Time Applicability

Explanation: Flights from departure airport EGNX are not allowed to use the restricted object UL186 HON - BIG if the flight is using this segment between 07:00 UTC and 16:00 UTC.

FROM	TO	Utilization	DCT Time Availability	Operational Goal
HON	BIG	Not available for traffic DEP EGNX	07:00..16:00	Time refers to time at HON.

Table 24: Example of RAD DCT Time Applicability

Explanation: The DCT segment from HON to BIG does only exist from 07:00 UTC until 16:00 UTC. During the time availability of the segment, flights from departure airport EGNX are not allowed to use the DCT segment if the flight is crossing HON between 07:00 UTC and 16:00 UTC.

3.3.4.5.2 Airport

a) **Departure Airport**

- A trajectory fulfils a "departure airport time condition" if the planned take-off time is a proper subset of the time-frame defined by the respective time condition.
- The estimated take-off time is calculated based on the estimated off-block time of the flight (derived from flight plan item 13) plus the planned taxi time at the departure airport.

Point or Airspace	Utilization	Time Applicability
TLA	Not available for traffic 1. DEP EGPH Type Jet 06:00..23:00 (05:00..22:00) except-via AGPED, NATEB, SAB	H24

Table 25: Example of RAD Departure Airport Time Condition

Explanation: Flights (type Jet) from departure airport EGPH are not allowed to use the restricted object TLA if the planned take-off time at departure airport EGPH is between 06:00UTC and 23:00UTC. If the take-off time is exactly 06:00UTC or exactly 23:00UTC, the time condition is still fulfilled. Assuming that the taxi time of departure airport EGPH is 5 minutes, the estimated off-block time can be between 05:55UTC and 22:55UTC (including the boundary values) in order to fulfil the time condition. Time condition not applies in case of routing via AGPED, NATEB, and SAB

b) **Arrival Airport**

- A trajectory fulfils an "arrival airport time condition" if the planned landing time is a proper subset of the time-frame defined by the respective time condition.
- The estimated landing time is calculated based on the estimated off-block time of the flight (derived from flight plan item 13) plus the planned taxi time at the departure airport plus the estimated en-route time.

AIRWAY	FROM	TO	Utilization	Time Applicability
UN857	BEGUY	PPN	Not available for traffic DEP EHAM With ARR LEMD	11:40..14:20 (10:40..13:20)

Table 26: Example of RAD Arrival Airport Time Condition

Explanation: Flights departing from airport EHAM are not allowed to use the restricted object UN857 BEGUY - PPN if the planned landing time at arrival airport LEMD is between 11:40UTC and 14:20UTC. If the landing time is exactly 11:40UTC or exactly 14:20UTC, the time condition is still fulfilled. Assuming that the taxi time of departure airport EHAM is 15

minutes and the planned en-route time between EHAM and LEMD is 01:45UTC, the estimated off-block time can be between 09:40UTC and 12:20UTC (including the boundary values) in order to fulfil the time condition.

c) **Significant point**

- A trajectory fulfils a "significant point time condition" if the estimated time when the flight crosses the respective significant point is a proper subset of the time-frame defined by the respective time condition.
- The estimated time of the flight at a particular significant point calculated based on the estimated off-block time of the flight (derived from flight plan item 13) plus the planned taxi time at the departure airport plus the estimated en-route time from the departure airport to the respective significant point.

d) **Route**

- A trajectory fulfils a "route time condition" if the estimated time-frame when the flight crosses the respective route segment is an intersection of the time-frame defined by the respective time condition.
- The estimated crossing time-frame of the particular route segment is defined as the difference between the time at the first significant point and the last significant point of the respective route segment. The calculation is based on the estimated off-block time of the flight (derived from flight plan item 13) plus the planned taxi time at the departure airport plus the estimated en-route time from the departure airport to the first significant point or the last significant point of the specific route segment.

e) **Airspace**

- A trajectory fulfils an "airspace time condition" if the estimated time-frame when the flight crosses the respective airspace is an intersection of the time-frame defined by the respective time condition.
- The estimated crossing time-frame of the particular airspace is defined as the difference between the time at the entry significant point and the exit significant point of the respective airspace segment. The calculation is based on the estimated off-block time of the flight (derived from flight plan item 13) plus the planned taxi time at the departure airport plus the estimated en-route time from the departure airport to the entry significant point or the exit significant point of the specific airspace.

3.3.4.6 Time availability expression

3.3.4.6.1 Time expressions

(1) The time periods are in Co-ordinated Universal Time (UTC) used by air navigation services and in publications issued by the AIS. The [:] colon is used to separate the time elements "hour" and "minutes".

(2) The expression "summer period" indicates that part of the year in which "daylight saving time" is in force. The other part of the year is named the "winter period". Times applicable during the "summer period" are given in brackets.

(3) If "winter period" and "summer period" is the same during the whole year there is no time given in brackets.

Period	Term
Distinction between winter and summer periods	23:00..05:00 (22:00..04:00)
One common period throughout the year	23:00..05:00.

Table 27: Example of RAD Time Expression

(4) Daylight saving time is UTC plus 1 hour. The "summer period" in Europe is introduced every year on the last Sunday in MAR at 01:00 UTC and ceases on the last Sunday in OCT at 01:00 UTC. For detailed description in each State the relevant AIP shall be checked.

(5) In accordance with ICAO Doc 8126 - AIS Manual, paragraph 5.5.2. f) "When describing periods of activity, availability or operation, use of the term "weekday" should be avoided and the day or days in question should be specified; where "weekend" is used, this should always be qualified by specific dates/days and times to remove any possibility of doubt."

(6) As prescribed by ICAO Doc 8400 PANS-ABC the following abbreviations for the week days and months are used in RAD and decoded as follows:

Abbreviation - Decode			
Day		*Month*	
MON	Monday	JAN	January
TUE	Tuesday	FEB	February
WED	Wednesday	MAR	March
THU	Thursday	APR	April
FRI	Friday	MAY	May
SAT	Saturday	JUN	June
SUN	Sunday	JUL	July
		AUG	August
		SEP	September
		OCT	October
		NOV	November
		DEC	December

Table 28: Abbreviations in RAD Time Expression

(7) Day (reference ISO8601) is a period of time of 24 hours starting at 0000 and ending on 2400 (which is equal to the beginning of 0000 at next day).

(8) Period (reference ISO8601) is a duration of time specified:

a) As a defined length of time (e.g. hours, days, months, years);

b) By its beginning and end points.

3.3.4.6.2 Period expression

a) **Periods within the daytime**

During the same day: **MON 07:00..23:00 (06:00..22:00)**

D / h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 29: Day Time Expression

Explanation: Period covers every Monday from 07:00 UTC until 23:00 UTC during winter period (during summer period, this example covers every Monday from 06:00 UTC until 22:00 UTC).

During the week same time: **MON..WED 07:00..23:00 (06:00..22:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 30: Week Time Expression

Explanation: Period covers every Monday, Tuesday and Wednesday from 07:00 UTC until 23:00UTC during winter period (during summer period, this example covers every Monday, Tuesday and Wednesday from 06:00 UTC until 22:00).

Every day same time: **07:00..23:00 (06:00..22:00)**

D/h	00	01	02	03	04		05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																									
TUE																									
WED																									
THU																									
FRI																									
SAT																									
SUN																									

Table 31: Every Day Time Expression

Explanation: Period covers every day Monday from 07:00 UTC until 23:00 UTC, Tuesday from 07:00 UTC until 23:00 UTC etc. until Sunday from 07:00 UTC until 23:00 UTC during winter period (in summer period, this example covers every day Monday from 06:00 UTC until 22:00 UTC, Tuesday from 06:00 UTC until 22:00 UTC etc. until Sunday from 06:00 UTC until 22:00 UTC).

b) **Periods overnight**

Before midnight

During the week same time: **MON..WED 23:00..05:00 (22:00 - 04:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 32: Every Week Time Expression

Explanation: Period covers every night from Monday 23:00 UTC until Tuesday 05:00 UTC, from Tuesday 23:00 UTC until Wednesday 05:00 UTC and from Wednesday 23:00 UTC until Thursday 05:00 UTC during winter period (during the summer period, this example covers every night from Monday 22:00 UTC until Tuesday 04:00 UTC, from Tuesday 22:00 UTC until Wednesday 04:00 UTC and from Wednesday 22:00 UTC until Thursday 04:00 UTC).

Every night same time: **23:00..05:00 (22:00..04:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON	■	■	■	■	■																			■
TUE	■	■	■	■	■																			■
WED	■	■	■	■	■																			■
THU	■	■	■	■	■																			■
FRI	■	■	■	■	■																			■
SAT	■	■	■	■	■																			■
SUN	■	■	■	■	■																			■

Table 33: Every Night Time Expression

Explanation: Period covers every night from Monday 23:00 UTC until Tuesday 05:00 UTC; from Tuesday 23:00 UTC until Wednesday 05:00 UTC etc. until from Sunday 23:00 UTC until Monday 05:00 UTC during winter period (during summer period, this example covers every night from Monday 22:00 UTC until Tuesday 04:00 UTC; from Tuesday 22:00 UTC until Wednesday 04:00 UTC etc. from Sunday 22:00 UTC until Monday 04:00).

After midnight

During the "same" day: **TUE 00:01..23:00 (MON 23:01..TUE 22:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	
WED																								
THU																								
FRI																								
SAT																								
SUN																								

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								■
TUE	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■	■		
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 34: Same Day Time Expression

Explanation: Period covers every Tuesday from 00:01 UTC until 23:00 UTC during winter period (during summer period, this example covers every Monday from 23:01 UTC until every Tuesday 22:00 UTC).

During the week "same" time: **TUE..THU 00:01..05:00 (MON..THU 23:01 - 04:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE	■	■	■	■	■																			
WED	■	■	■	■	■																			
THU	■	■	■	■	■																			
FRI																								
SAT																								
SUN																								

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								■
TUE	■	■	■	■	■																			
WED	■	■	■	■	■																			
THU	■	■	■	■																				
FRI																								
SAT																								
SUN																								

Table 35: Same Week Time Expression

Explanation: Period covers every night from Tuesday 00:01 UTC until Wednesday 05:00 UTC and from Wednesday 00:01 UTC until Thursday 05:00 UTC during winter period (during the summer period, this example covers every night from Monday 23:01 UTC until Tuesday 04:00 UTC, from Tuesday 23:01 UTC until Wednesday 04:00 UTC and from Wednesday 23:01 UTC until Thursday 04:00 UTC).

c) **Continuous periods - during daytime and over night**

Before midnight

Week day/night: **MON 07:00 (06:00)..WED 23:00 (22:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 36: Day Time Expression

Explanation: Period covers from Monday 07:00 UTC until Wednesday 23:00 UTC during winter period (during summer period, this example covers from Monday 06:00 UTC until Wednesday 22:00 UTC).

Extended Weekend: **FRI 23:00 (22:00)..MON 07:00 (06:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 37: Extended Weekend Time Expression

Explanation: Period covers from Friday 23:00 UTC until Monday 07:00 UTC during winter period (during summer period, this example covers from Friday 22:00 UTC until Monday 06:00 UTC).

Weekend: **SAT..SUN**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 38: Weekend Time Expression

Explanation: Period covers from Saturday 00:00 UTC until Sunday 24:00 UTC during winter period and during summer period.

After midnight

During the "same" day: **TUE 00:01..23:00 (MON 23:01..TUE 22:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 39: Same Day Time Expression

Explanation: Period covers every Tuesday from 00:01 UTC until 23:00 UTC during winter period (during summer period, this example covers every Monday from 23:01 UTC until every Tuesday 22:00 UTC).

During the week "same" time: **TUE..THU 00:01..05:00 (MON..THU 23:01 - 04:00)**

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

D/h	00	01	02	03	04	05	06	07	08	09	10	11	12	13	14	15	16	17	18	19	20	21	22	23
MON																								
TUE																								
WED																								
THU																								
FRI																								
SAT																								
SUN																								

Table 40: Same Day During the WeekTime Expression

Explanation: Period covers every night from Tuesday 00:01 UTC until Wednesday 05:00 UTC and from Wednesday 00:01 UTC until Thursday 05:00 UTC during winter period (during the summer period, this example covers every night from Monday 23:01 UTC until Tuesday 04:00 UTC, from Tuesday 23:01 UTC until Wednesday 04:00 UTC and from Wednesday 23:01 UTC until Thursday 04:00 UTC).

d) **Seasonal period at AIRAC date (inclusive expression)**

Every year within the same AIRAC cycles:
First AIRAC APR..First AIRAC SEP

Explanation: Period covers each year from the FIRST day of the first AIRAC in the month of April until the LAST day of the first AIRAC in the month of September.

Every year within seasonal event limited by AIRAC cycles:
Ski Season (First AIRAC DEC..Last AIRAC MAR)

Explanation: Period covers ski season that goes from the FIRST day of the first AIRAC in the month of December until the LAST day of the last AIRAC in the month of March.

(2) The terms “First” and “Last” before term “AIRAC” shall be used only to eliminate ambiguity for months that have two AIRAC cycles.

(3) Each year has 13 AIRAC cycles and only 12 months. One of the months will have 2 AIRAC cycles and they are as follows: 2021 - DEC, 2022 - DEC, 2023 - NOV, 2024 - OCT, 2025 - OCT.

3.3.4.7 Dependent Applicability

3.3.4.7.1 Route Dependent Applicability

(1) The availability of the restricted object can be dependent on the availability or non-availability of one or several ATS route portion/s.

(2) The strategic availability of the referred ATS route is published through AIS of the respective state in which the route is located (e.g. definition of CDR1 in the AIP).

(3) Tactical availability or other deviations from the strategic availability are published by the EAUP (and updates contained in the EUUP) or through other AIS publications (e.g. NOTAM).

AIRWAY	FROM	TO	Utilization
UN867	GARMI	VASUX	Not available for traffic ARR (az:MIDLANDS_GROUP, ad:EGGW/NE/SC/SH/SS/TC/UL/UN) When M184 is available

Table 41: Example of RAD Route Dependent Applicability

Explanation: The restricted object UN867 is not available from GARMI to VASUX for traffic arriving to MIDLANDS_GROUP/EGGW/NE/SC/SH/SS/TC/UL/UN if the nearby route M184 is available.

AIRWAY	FROM	TO	Utilization
N14	PEMOB	LANPI	Only available for traffic When STU M17 VATRY is not available

Table 42: Example of RAD Route Dependent Applicability

Explanation: The restricted object N14 is only available from PEMOB to LANPI if the nearby route M17 is unavailable from STU to VATRY.

AIRWAY	FROM	TO	Utilization
L919	DINRO	GOSLO	Compulsory when available for traffic ARR LBWN via DINRO

Table 43: Example of RAD Route Dependent Applicability

Explanation: For flights arriving to LBWN via DINRO is compulsory to file the route L919 from DINRO to GOSLO if this segment is available.

3.3.4.7.2 Airspace dependent applicability

(1) The availability of the restricted object can be dependent on the activation of a given airspace.

(2) The strategic activity of the airspace is published through AIS of the respective State in which the airspace is located (e.g. definition of scheduled activity in the AIP).

(3) Tactical availability or other deviations from the strategic availability are published by the EAUP (and updates contained in the EUUP) or through other AIS publications (e.g. NOTAM).

AIRWAY	FROM	TO	Utilization
UN26	MANIG	GOBUR	Not available for traffic When LFTSA6 is active

Table 44: Example of RAD Airspace Dependent Applicability

Explanation: The restricted object UN26 from MANIG to GOBUR is not available when the nearby military airspace LFTSA6 is active.

AIRWAY	FROM	TO	Utilization
T282	POBIG	GAVDU	Only available for traffic ARR ad:EPLB when as:EPD26 is active

Table 45: Example of RAD Airspace Dependent Applicability

Explanation: The restricted object T282 from POGIB to GAVDU is only available for traffic arriving to EPLB if the nearby military airspace EPD26 is active.

AIRWAY	FROM	TO	Utilization
UZ67	OMASI	KORED	Compulsory for traffic ARR EDDM Except LST200 is active

Table 46: Example of RAD Airspace Dependent Applicability

Explanation: For flights, arriving to EDDM is compulsory to file UZ67 from OMASI to KORED unless the military airspace LST200 is active.

3.3.4.7.3 FUA Restrictions

FUA restrictions are a specific usage of Traffic Flow Restrictions and special cases of dependent applicability restrictions. **For further detail, see also Chapter 4.**

3.3.4.8 FRA in the RAD

a) **For details please see ERNIP Part 1, Chapter 10.**

3.4 FRA DCT Restriction

3.4.1 Purpose

(1) The FRA DCT restriction defines the rules for flying direct (DCT) in the Free Route Airspace (FRA).

(2) The FRA DCT restriction has the same features as a conventional DCT Limitation restriction, but enhanced with the possibility to define the FRA Entry / Exit points and the FRA Intermediate points.

3.4.2 Creation

(1) The FRA DCT restrictions are created in CACD by the NM Airspace Data Team based on State AIPs in order to implement the published FRA characteristics in NM systems.

3.4.3 Publication

(1) FRA DCT restrictions as all other AURA restrictions / limitations are available via B2B in AIXM format.

3.4.4 Usage

(1) The FRA DCT restriction is used by IFPS to validate/invalidate Flight Plans and by the Path Finder to generate valid routes.

(2) The FRA DCT restriction has the below parameters defining its usage.

a) **Characteristics of a Free Route Airspace**

- A Free Route Airspace is published by relevant State in accordance with ERNIP Part 1.
- The FRA DCT Restrictions created to implement these characteristics can be:
  - En-route or Cross-border.

b) **En-route FRA DCT restriction**

- It identifies Airspace as Free Route Airspace and defines the conditions to cross it.
- This Restriction contains:
  - Reference Location: the Airspace (RAS) where FRA is applicable;
  - Lateral Limits: the ones of the Airspace used as Reference Location;
  - Vertical Limits: can be implicit (all the RAS) or a subset of them (as defined by the State / FAB / ANSP);
  - FRA Intermediate points allowed: this is expressed by the DCT limit itself, which can have only 1 of these 2 values:
    N/A = Unlimited (UNL); meaning that airspace can be crossed on a DCT via whatever FRA Intermediate point.

    0NM; meaning that outside the ATS route network the airspace can be crossed on a DCT only from FRA Entry point to a FRA Exit point or via the specifically allowed FRA Intermediate points. When specific FRA Intermediate points are allowed

they are added in this Restriction as FRA Points - Intermediate Points.
    - FRA Entry / Exit points: visible in En-route FRA DCT Restriction as FRA Entry / Exit Points but they are actually implemented in the Cross-border FRA DCT Restriction.

c) **Cross-border FRA DCT restriction**

- It defines how to penetrate and leave the Free Route Airspace laterally or horizontally;
- The borders are directional and the Restriction Flow Routing Elements are the ENTRY and /or EXIT points. Exceptionally allowed DCT segments across the border can also be added as Flow Routing Elements, including DCT segments AD-PT or PT-AD (same as for conventional Cross-border DCT restrictions);
- The DCT limit is set to 0NM or UNL;
- In order to allow definition of how traffic shall enter the FRA from below airspace, or leave the FRA into below Airspace, the concept of horizontal border/floor is introduced. This is used mainly to implement Restrictions for Departing/Arriving traffic from/to Airspaces below the FRA;
- When needed an internal horizontal Airspace Border/floor can be used (Airspace Border Crossing Location with a horizontal border/floor inside a single Airspace). For this particular case a special convention has been adopted. The vertical Limit of the Reference Location is mandatory, and:
    - If the FRA border is bidirectional, vertical Limit = [border level, border level];
    - If the FRA border is from lower to upper, vertical Limit = [border level, CEL];
    - If the FRA border is from upper to lower, vertical Limit = [Lower Limit, FLR].

d) **Operational Goal**

- Its format depends on the type of FRA DCT restriction (En-route or Cross-border), and its elements.

e) **DCT Segments**

- Significant points defining the DCT, Vertical limits and information on whether relevant restriction is Allowed.

f) **FRA Points**

- FRA Entry / Exit points and FRA Intermediate points including relevant vertical utilisation;
  Important Note:
  Due to NM system capability FRA significant point relevance (A) and/or (D) is not coded separately and coincides with (I).
- Each FRA point can be defined either as part of an En-route FRA DCT restriction (all FRA Intermediate points) or a Cross-border FRA DCT restriction (all FRA border points - Entry, Exit and Entry / Exit);
- FRA Intermediate Points can be defined in an En-route FRA DCT Restriction with DCT Distance Limitation 0NM, meaning the airspace

can be crossed on a DCT segment only from FRA Entry point to FRA Exit point or via the specifically allowed FRA Intermediate points.

Important Notes:

1. *Due to NM system coding and processing capabilities and requirements for majority of FRA significant points the FRA relevance is presented as "EX" regardless of States AIP publications.*
2. *For FRA Intermediate points (I) the reason is representation of allowed "vertical" connection from / to the FRA area. When required "vertically" FRA (I) is presented as EX because from below the FRA area flight is entering and point is (E) while from above the FRA area flight is existing and point is (X).*
3. *For unidirectional FRA Horizontal Entry or Exit points the main reason is representation of allowed "border" connection from one FRA area to another FRA area. Additionally depending on FRA area/s and for the same reason as FRA (I) some unidirectional FRA Entry or Exit points are "vertically" presented as EX.*
4. *"Horizontally" FRA relevance is in accordance with State AIP publications only for unidirectional FRA / none FRA border points.*

g) **Flow Conditions - Reference Location**

- It is either "Crossing Airspace" (ERAS or CRAS - "Local" FRA area) - defined as En-route FRA DCT restriction or "Crossing Airspace Border" into a FRA area or out of a FRA area (adjacent AUAs - "Cross-border" FRA area) which is defined as Cross-border DCT restriction;
- A Cross-border FRA DCT Restriction is made on the possible combinations of Airspace types;
- The Airspaces defining the Airspace Border must be adjacent;
- Reference Locations in Cross-border FRA DCT Restrictions can only be OR'd with the same Airspaces (e.g. 'EDUUFRAE/EDUUFRAN can only be OR'd with EDUUFRAE/EDUUFRAN).

h) **Flow Conditions - Vertical Limits**

- Either the default vertical limits of the Reference Location, or an explicitly defined subset of its vertical limits.

i) **Flow Conditions - Exception of Military Flights**

It is possible to exclude military flights from a DCT Limitation Restriction by three main possibilities:

- Civil and Military flights are restricted in the same way;
- Military flights are unrestricted for DCTs;
- Military flights are less restricted than Civil flights.

In addition, the following case could occur and requires the creation of Traffic Flow Restrictions in addition to the DCT Limitation Restriction: A DCT Distance Limitation applies to Civil flights only (not to Military flights) but DCT segments are forbidden for Civil and Military flights.

j) **Flow Conditions - DCT Distance Limitation**

- For En-route FRA DCT Restriction, the DCT Distance Limitation defines through which points the DCT/s are allowed
  N/A = Unlimited (UNL); meaning that airspace can be crossed on a DCT via whatever point including geo coordinates.

  0NM; meaning that outside the ATS route network the airspace can be crossed on a DCT only from FRA Entry point to a FRA Exit point or via the specifically allowed FRA Intermediate points. When specific

FRA Intermediate points are allowed they are added in this Restriction as FRA Points - Intermediate Points.

- For a Cross-border FRA DCT Restriction, the DCT Distance Limitation must be set to 0NM (contains E/X) or UNL (allows to cross the border on a DCT).

k) **Applicability**

- Start - End Date, Day/s of the week, Start - End Time;
- No Dependent Applicability can be defined.

3.4.4.2 FRA significant points with different vertical utilisation rules and availability

(1) At several FRA interfaces between States / FABs / ANSPs FRA significant points have specific conditions of use in addition to FRA general procedures as published in State AIP ENR 1.3.

(2) In most of the cases, the different vertical utilisation rules and availability of FRA significant points are applicable when they are located on boundaries where delegation of the responsibility for provision of ATS exists or on TMA boundaries or in the case of a “balcony” FRA area.

(3) Currently these vertical FL differences in utilisation are published in State AIPs as part of either ENR 4.1 or ENR 4.4 remarks and in CACD are expressed by a FRA DCT restriction.

(4) The example below (see Figure 17) shows different vertical FRA relevance expressed by FLs of point JJJJJ.

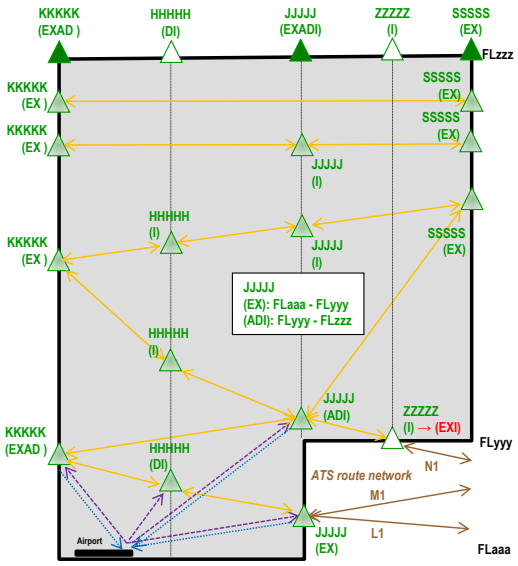


Figure 17: Example of FRA point different vertical relevance

(5) In CACD there are two possible ways for expression either by:

- Inserting the vertical limits directly in FRA point relevance definition (Specific Properties - FRA points); or
- Directly referencing FRA point to the relevant RAS representing the FRA area (Specific Properties - Flow Conditions).

(6) The differences in vertical FL utilisation of any FRA significant point shall be inside the general vertical limits of relevant FRA area.

(7) In the case of FRA significant point located on TMA boundary and used as (A) / (D) any vertical limitation published by States is overridden by the RAS definition in CACD and system uses the lower FRA limit as reference. This is done in order to allow proper and smooth climb/descend flight profile and avoid flight plan invalidation.

3.4.4.3 FRA Vertical Connectivity in FRA-IP

(1) The entry to or exit from any FRA area depends on the length of the "Direct" flight planning option allowed in it by States / FABs / ANSPs.

(2) When the FRA area DCT limit is 0NM, the DCT limit (xxxNM or 0NM) allowed within the AUA or RAS below the FRA area has no influence on flight plan processing, as relevant allowed cross-border FRA DCT restrictions override this DCT limit and it is ignored.

(3) In order to allow definition of how traffic shall "vertically" enter the FRA area from the underlying airspace, or "vertically" leave the FRA area into the airspace below, the concept of horizontal border (floor) is introduced in CACD.

(4) The borders are directional and the restriction Flow Routing Elements are relevant FRA significant points (I, A, D) which for FRA processing purposes only are used for "vertical" entry and/or exit. When a FRA significant point is mentioned as a Flow Routing Element, then overflying that point is either forbidden or mandatory at the specified level range. When a sequence of FRA significant points is mentioned as a Flow Routing Element then overflying is either forbidden or mandatory in the same sequence as the points are listed, at the specified level range regardless of which FRA Intermediate points are overflown, if any at all.

(5) Exceptionally allowed DCTs across the FRA border can also be added as Flow Routing Elements, including DCTs aerodrome - point and vice-versa (same as for conventional Cross-border DCT restrictions).

(6) In all cases presented below the vertical transition between the ATS route network and FRA area and vice-versa shall be reference in flight plan to any of the above defined in CACD FRA significant points.

(7) The following cases are possible in FRA vertical boundary (wall) crossing:

a) Transition via FRA (D) / FRA (A) point

States / FABs / ANSPs might require transit when the SID/STAR maximum level is different from the FRA minimum level. If the relevant SID last point or STAR first point is clearly defined as FRA (D) or FRA (A) respectively, the gap is overridden by the FRA point definition. The relevant cross-border FRA DCT restriction can allow such "vertical" transition by artificially expanding the lower vertical limit of all required FRA (D) or (A) points. The example is presented below (see Figure 18).

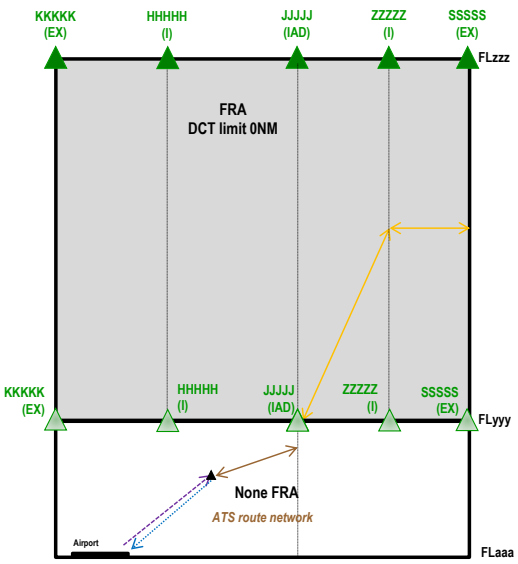


Figure 18: Example of FRA / non-FRA transition via specified FRA (D)/(A) point

b) Transition via certain FRA (I) point

States / FABs / ANSPs might require transit only via a limited or selected number of FRA Intermediate (I) points. The relevant cross-border FRA DCT restriction forbids cross-border operations between airspace with ATS route network and FRA area and vice-versa except via explicitly defined FRA significant points. The example is presented below (see Figure 19).

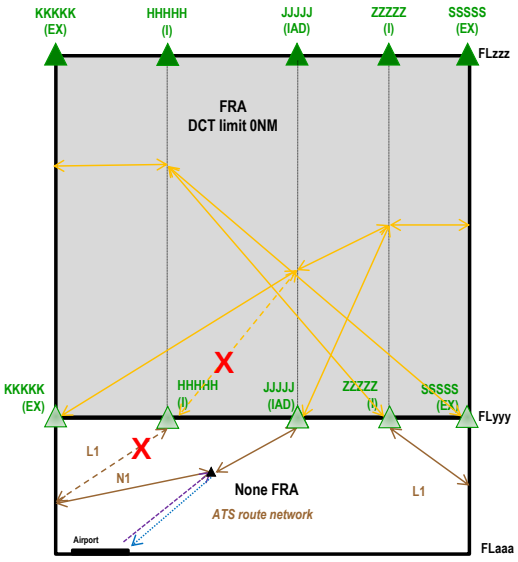


Figure 19: Example of FRA / non-FRA transition via specified FRA (I) point

c) Transition “laterally” via FRA (I) point

States / FABs / ANSPs might require transit not via a defined/allowed FRA significant point but referenced to it (before or after) in order to allow a smooth flight profile. The relevant cross-border FRA DCT restriction can allow such “lateral” transition. It forbids cross-border operations between airspace with ATS route network and FRA area and vice-versa except via explicitly defined for that purpose FRA significant points (I). The example is presented below (see Figure 20).

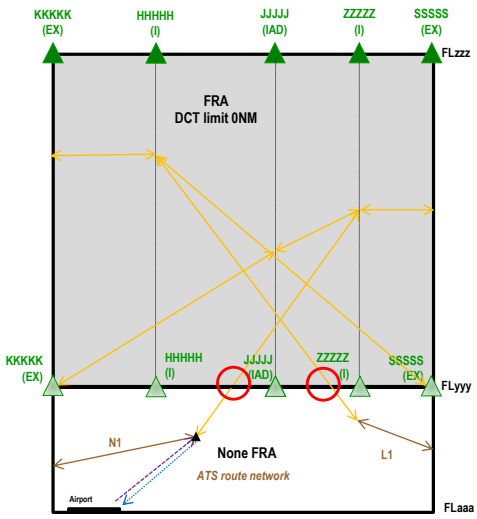


Figure 20: Example of FRA / non-FRA transition "laterally" off defined FRA points

d) Transition "vertically" below FRA significant point

States / FABs / ANSPs might require transit below the lower vertical limit of a defined/allowed FRA significant point in order to allow a smooth flight profile. The relevant cross-border FRA DCT restriction can allow such "vertical" transition by:

- Artificially expanding the lower vertical limit of all required FRA A/D points coded as FRA Intermediate points. The cross-border operations between airspace with ATS route network and FRA area and vice-versa are allowed when the trajectory upper limit is above the FRA (I) "expanded lower" limit. The example is presented below with "expanded lower" limit from FLyyy to FLxxx (see Figure 21).
- Forbidding cross-border operations between airspace with ATS route network and FRA area and vice-versa except via explicitly defined for that purpose FRA significant points (A, D, I).

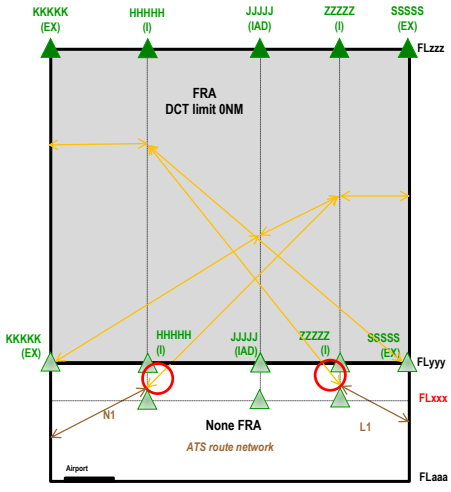


Figure 21: Example of FRA / non-FRA transition "below" defined FRA points

e) Transition of flight to/from close proximity airports out of the FRA area

For certain airports located in close proximity out of the FRA area, the climb or descent profile at a FRA Entry / Exit point might be below the lower FRA

limit. In this case the flight profile will not enter/exist FRA at the defined point and normally the flight plan shall be invalidated.
If States / FABs / ANSPs require flight plans to be accepted, they can achieve this via a FRA DCT restriction. The relevant cross-border FRA DCT restriction forbids cross-border operations between airspace with ATS route network and FRA area and vice-versa except via explicitly defined for that purpose FRA significant points (E, X, EX). The example is presented below (see Figure 22).

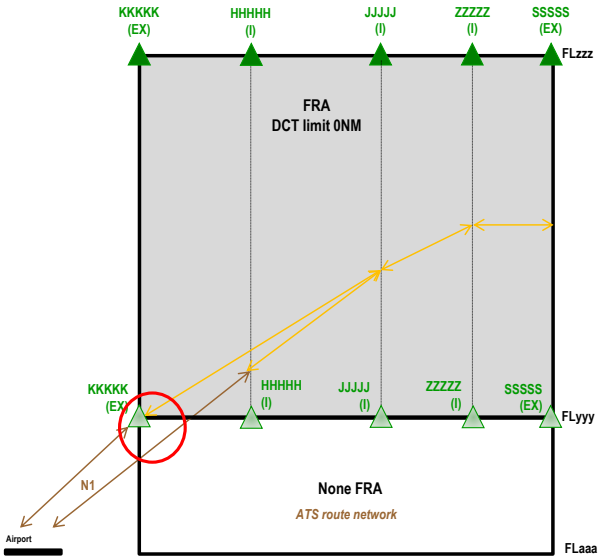


Figure 22: Example of FRA / non-FRA ARR/DEP transition for close proximity FRA area airports

3.4.4.4 FRA area border "clipping"

(1) The term "clipping" is used in the case when any planned DCT intends to exit and then re-enters the relevant FRA area.

(2) The relevant cross-border and en-route FRA DCT restrictions defining the FRA Entry / Exit points (how to penetrate and leave the FRA area laterally) as well as the conditions to cross the FRA area prevent such a DCT to be filed. The relevant DCT is unavailable as the flight attempts to cross the FRA area (AUA) border via non-defined FRA significant point.

(3) The example is presented below (see Figure 23). Both DCTs LLLLL - KKKKK and XXXXX - NNNNN are rejected, as the relevant FRA DCT restriction prohibits to cross the FRA (AUA) border via "not allowed" FRA Exit points (points identified as "1") and FRA Entry points (points identified as "2").

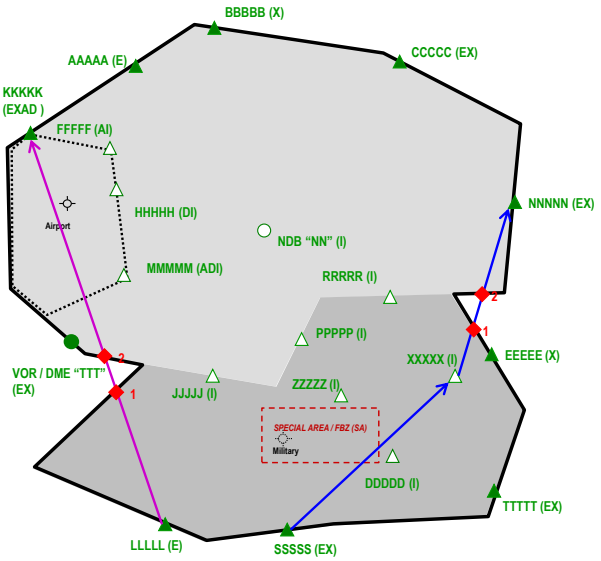


Figure 23: Example of FRA (AUA) border "clipping" rejection

3.4.4.5 FRA significant points and direction of cruising levels in FRA area

(1) The FL orientation scheme (FLOS) applied by each State is normally published in AIP ENR 1.7. Without FRA, each ATS route (ENR 3.3) has a defined direction of cruising levels expressed in terms of ODD or EVEN levels. Cases where direction deviations from ENR 1.7 exist shall be reflected in ENR 3.3 with correct ODD or EVEN FLs.

(2) In FRA, regardless of the existence of the ATS route network, there are flights towards a relevant FRA significant point from different directions; however they are in accordance with the published FLOS. Deviations from the published direction of cruising levels are necessary in several cases for operational reasons related to ATC Unit responsibility of the same FL (ODD or EVEN) over a FRA significant point.

(3) Currently all FRA significant points and direction of cruising levels are published in State AIPs as part of either ENR 4.1 or ENR 4.4 remarks.

(4) This data is NOT included in CACD as part of the FRA definitions. NM systems are not checking the compatibility between the State FLOS and flight plans filed.

3.5 DCT Limitation Restriction

3.5.1 Purpose

(1) The DCT Limitation restriction defines DCT segment limits for AUAs (ATC Unit Airspaces) or AUAGs (ATC Unit Airspace Groupings) or RAS, Cross-border DCT limits between AUAs or AUAGs or RAS, and DCT segment limits for Aerodromes.

(2) The DCT Limitation restriction covers requirements for conventional DCT Limitations.

3.5.2 Creation

(1) As being part of the RAD DCT Limitation restrictions are created in CACD by the NM RAD Team based on proper request by relevant State / FAB / ANSP National RAD Coordinator (NRC).

3.5.3 Publication

(1) DCT Limitation restrictions as all other AURA restrictions / limitations are available via B2B in AIXM format.

(2) DCT Limitation restrictions are also published as xls file via NOP RAD Portal, RAD Home as part of the RAD Annex 3A/3B.

3.5.4 Usage

(1) The DCT Limitation restriction is used by IFPS to validate / invalidate Flight Plans and by the Path Finder to generate valid routes.

(2) The DCT Limitation restriction has the below parameters defining its usage.

a) **Operational Goal**

- Its format depends on the elements of the Restriction and its format depends on the type of DCT Limitation restriction (En-route, Cross-border or Aerodrome), and its elements (AUA, AUAG, RAS, Aerodrome).

b) **DCT Segments**

- The DCT Limitation restriction that contains the DCT Distance Limitation (in NM) is an Allowed Restriction. If flying "Direct" within reference location airspace or to/from the Reference Location Aerodrome, it is mandatory that the DCT is shorter than the DCT Distance Limitation (flow condition);
- The DCT Distance Limitation value is thus the maximum allowed for a DCT segment in that particular Airspace or for departing from / arriving to an Aerodrome. The DCT Distance Limitation value is expressed without decimal NM. If the value is 0NM (zero) then no DCT segments are allowed in this Airspace, or across that border, or to depart from / arrive to this Aerodrome. The Cross-border DCT must be compatible with the Airspace (En-route) DCT limit;
- The DCT segments that are allowed but longer than the DCT Distance Limitation condition shall be added as an "Allowed" (Y) DCT Segments;
- The DCT segments that are not allowed, although they are shorter than the DCT Distance Limitation Condition will be subject to a separate, "Not Allowed" (N) DCT Restriction. Such a Restriction will have the same Restriction Group ID as the Mandatory one. The "Not Allowed" (N) Restriction can only exist if the "Allowed" (Y) one exists, and it cannot contain a DCT Distance Limitation value (which is stored in the "Allowed" (Y) Restriction);
- In DCT Limitation restrictions, both vertical limits (lower / upper FL) of the flow routings are included.

c) **Flow Conditions - Exception of Military Flights**

- The same principles apply as for conventional FRA DCT restrictions (see 3.4.4).

d) **Flow Conditions - Reference Location**

- It is:
  - "Crossing Airspace";
  - Departing / Arriving Aerodrome;

- "Crossing Airspace Border";
- A Cross-border DCT Limitation restriction is made on the possible combinations of Airspace types AUA / AUAG / ERAS / CRAS;
- The Airspaces defining the Airspace Border must be adjacent;
- Each Flow Routing (allowed/forbidden DCT Segment) must cross the Airspace Border Reference Location;
- Reference Locations in cross-border DCT restrictions can only be OR'd with the same Airspaces (e.g. 'EBDCT/EHDCT can only be OR'd with EHDCT/EBDCT).

e) **Flow Conditions - Use of Slices as Reference Location**

- A FL band can be defined for the Reference Location (Airspace or Airspace border) in order to define DCT Limitation restrictions with different values at different levels.

f) **Applicability**

- Start - End Date, Day/s of the week and Start - End Time;
- No Dependent Applicability can be defined.

g) **Additional Rules for Cross-border DCTs**

- The Cross-border DCT Limitation restrictions follow the same rules as the Airspace (En-route) and Aerodrome DCT Limitation restrictions:
  a. Any DCT Limit value is defined in an "Allowed" (Y) Restriction containing the exceptionally allowed DCT Segments (if any);
  b. An optional corresponding (same Reference Location) "Not Allowed" (N) Restriction can exist stating any additionally "Not Allowed" (N) DCT Segment;
  c. This means that if there are no general cross-border DCT constraints but a particular DCT Segment is to be forbidden:
     i. An "Allowed" (Y) Restriction is created with DCT Distance Limitation value and no Flow Routings;
     ii. A corresponding "Not Allowed" (N) Restriction is created with the forbidden segment as Flow Routing.
  d. CACD will enforce coherency between the Airspace/Aerodrome DCT limits and cross border constraints by:
     i. Ensuring that all DCT Segments explicitly "Allowed" (Y) or "Not Allowed" (N) in the cross-border DCT Limitation restriction do not violate the DCT limits of each crossed A RAS, or are explicitly allowed.
     ii. Ensuring that explicitly allowed DCT Segments mentioned in Airspace or Aerodrome DCT Limitation restriction do not violate, or are explicitly allowed in any Airspace Border it crosses.
     iii. Ensuring that the DCT Distance Limitation in a cross-border DCT Limitation restriction is not higher than the lowest DCT Distance Limitation of all Airspaces crossed.
  e. Explicitly "Not Allowed" (N) AUA/AUAG/RAS Cross-border DCT Segments may only be "Not Allowed" (N) in the cross-border DCT Limitation restriction for the AUA/AUAG/RAS crossed. They do not need to (and indeed should not) be "Not Allowed" (N) for the Airspace DCT Limitation Restriction of each crossed

AUA/AUAG/RAS if it is an En-route DCT Segment (or the Aerodrome DCT if it is an Aerodrome DCT Segment), as this would result in too many IFPS error messages.

- A DCT Segment which is cross-border (from Airspace A to B) and defined as an "Allowed" (Y) in a DCT Limitation restriction with Airspace A as Reference Location, may not be longer than the DCT Distance Limitation value possibly imposed on Airspace B through a DCT Limitation restriction, unless it is defined as an allowed Flow Routing element in this DCT Limitation restriction as well.
- A DCT Segment which is cross-border (from Airspace A to B) and defined as a "Not Allowed" (N) in a DCT Limitation restriction with Airspace A as Reference Location, shall be longer than the DCT Distance Limitation value possibly imposed on Airspace B through a DCT Limitation restriction, or it shall be defined as a "Not Allowed" (N) DCT segment in this DCT Limitation restriction as well.

3.6 Profile Tuning Restriction (PTR)

3.6.1 Purpose

(1) The PTR influences the flight profile calculation in order to count the flight in certain operational airspaces in accordance with applicable letters of agreement. At a later stage, this flight profile is checked against the RAD. Additionally the PTRs might also be used to correct addressing in IFPS (where special conditions apply) and to better reflect controllers' workload through fine-tuning of the profile.

(2) The PTR adapts the profile only vertically and intends to restrict a 3D profile, meaning that the flight is already on that particular 2D track but must be restricted in the 3D.

(3) PTRs cover two main cases:

- Transfer of control and co-ordination agreements between ATC sectors/units (Letters Of Agreement - LOAs);
- Fine-tuning of NM profiles in order to have correct counts in Traffic Volumes and/or correct FPM addressing.

3.6.2 Creation

(1) PTRs are created in CACD by the NM Airspace Data Team based on proper request by relevant State / FAB / ANSP National Environment Coordinator (NEC) or Local Environment Coordinator (LEC). PTRs can be live updated.

(2) PTRs are kept to a strict minimum. PTR shall not be created where a Traffic Volume with excluded Flow can have the same purpose, provided there is no need to avoid over-addressing of these flights in the IFPS processes.

(3) Three types of PTRs can be created in relation to further NM publication:

- B2B = YES; sent out and IFPS profile is influenced
- B2B = NOT and Airborne Only = NOT; not sent out and only the flights in TACT are influenced (i.e. FTFM/RTFM)
- B2B = NOT and Airborne Only = YES. Not sent out and only the flights ACTIVE in TACT are influenced.

The B2B flag remains Live Updatable in CACD.

3.6.3 Publication

(1) Based on States / FABs / ANSPs requirements only selected number of PTRs (B2B = YES see below) are published by NM for information and use by the Operational Stakeholders.

(2) PTRs as all other AURA restrictions / limitations are available via B2B in AIXM format.

3.6.4 Usage

(1) The Profile Tuning Restriction has the below parameters defining its usage.

a) **Operational Goal**

- It is mandatory;
- It contains a brief free text description on what is required to be achieved in order users to understand why the Restriction is defined.

b) **Textual Description**

- It is optional, which is supposed to facilitate checking the codification of the PTR;
- It contains a textual resume of the coded PTR. For a complicated PTR it might happen that its codification is not fully in agreement with the intention of those having established the PTR.

c) **Enhanced Processing of PTRs**

- The three PTRs type usage is as follows:
  - B2B = YES
    PTR is used in profile calculations by the IFPS (IFPUV) and ETFMS at all profile calculations (FTFM, RTFM and CTFM);
  - B2B = NOT and Airborne Only = NOT
    PTR is used only by the ETFMS at all profile calculations (FTFM, RTFM and CTFM);
  - B2B = NOT and Airborne Only = YES
    PTR is used only by the ETFMS and only for CTFM profile calculation; this is, when the ETFMS gets notice that the flight is activated (flying).
- The B2B NOT PTRs are those that are not applied at IFPS profile calculation but at ETFMS profile calculation only. In ETFMS, “Airborne Only” PTRs are applied to a Flight Profile only when the flight is TACT Activated (Applied to Actual Profile).

d) **Flow Routing**

- Due to the PTR purposes the Flow Routing is a subset of the conditions as contrary a PTR will re-route the flight in 2D which would make it a Traffic Flow Restriction.
- It is the same as the Reference Location, except the vertical limits.
- The level range specified for the Flow Routing must be a subset of the level range defined for the Reference Location.
- Any type of significant point can be used;
- When Airspace is used as a Flow Routing element, then the penetration of it is either Forbidden or Mandatory at the specified level range.
  - If Forbidden, the profile is calculated that it is never inside the Airspace at the forbidden FL band;

- If Mandatory, the profile is calculated that it is at some moment within the Airspace at the mandatory FL band. The fact that Airspace (at a given FL band) is mandatory in a PTR does not necessarily imply that the profile will avoid the Airspace above or below the given FL band.

- If a Route Portion with multiple segments is mentioned as a Forbidden or Mandatory Flow Routing, it is not necessary to split it into the individual segments (unlike for traffic Flow Restrictions).
- Flights using only an intermediate segment of the Route used as Flow Routing will be affected by the PTR.

e) **Flow Conditions**

- It is a fixed set of conditions;
- The Reference Location of a PTR has to be the same as the Flow Routing, except the vertical limits.

f) **Flight Profiles**

When flight profiles are required to be at a given level at a given place, or when they are required not to be at a given level somewhere, then several options are possible but they should not be used in all circumstances.

The NM flights' profile incorporate PTRs and for that reason may be the indirect cause of invalidating an flight plan (e.g. by pushing the flight profile to the RAD or other constrain).

- In case of State / FAB / ANSP requires that the flight plan originator file his RFL according to certain level restriction(s) then these constrains should be expressed/published in the RAD and then implemented as a Traffic Flow Restriction causing the flight plan to be rejected if it is not compliant.

If the insertion of an RFL in the filed flight plan is not required then PTR is usually created. The flight plan will thus not be rejected but the calculated flight profiles by the NM systems will be adjusted by the PTRs that impact the flight. The flight profile 'adjustment' takes the form of short level-offs. The PTR conditions 3D is based on the RFL. For example if flight is forced to be between FL(A) and FL(B) on a given ATS route segment then it has to be ensured that it will capture the ones which aim to reach FL(A) or higher (even higher than FL(B) or FL(B+) or FL(B++)). Selecting the flights should be done using the ATS route (lower) on which the Restriction applies but use it as a Route Portion - Point List in order to allow the selection of a FL band FL(A) - UNL. This FL band would not be allowed if you use the lower route as Route Portion - Id Relevant because then the vertical limits need to be respected.

- In case of State / FAB / ANSP requirement that a given flow of traffic should be between FL(A) and FL(B) on a given ATS route segment then the flight plan originator should file the lower ATS route and possibly have an adapted RFL.

  In such case two options are possible:
  - Option 1: Publish a RAD on the upper route, forbidding it and add a PTR on the lower Route Portion - Id Relevant to keep them between FL(A) and FL(B) on this portion. (Correct Route and adapted RFL will be required); or
  - Option 2: Create a PTR on the lower Route Portion - Point List (No RFL and filing on the upper will be allowed).

Create a PTR on the upper Route Portion Point List only if there is no lower route available. But in this case ensure that flying DCT underneath the route is allowed;

- When forcing flights to stay below certain Sector A (Green volume) (FL105 - FL205) traffic based on the 3D derived from the RFL has to be selected. As Reference Location an extended band consisting of same Sector A (FLR - UNL), and as Forbidden Flow Routing Sector A (FL205 - CEL) will be used.

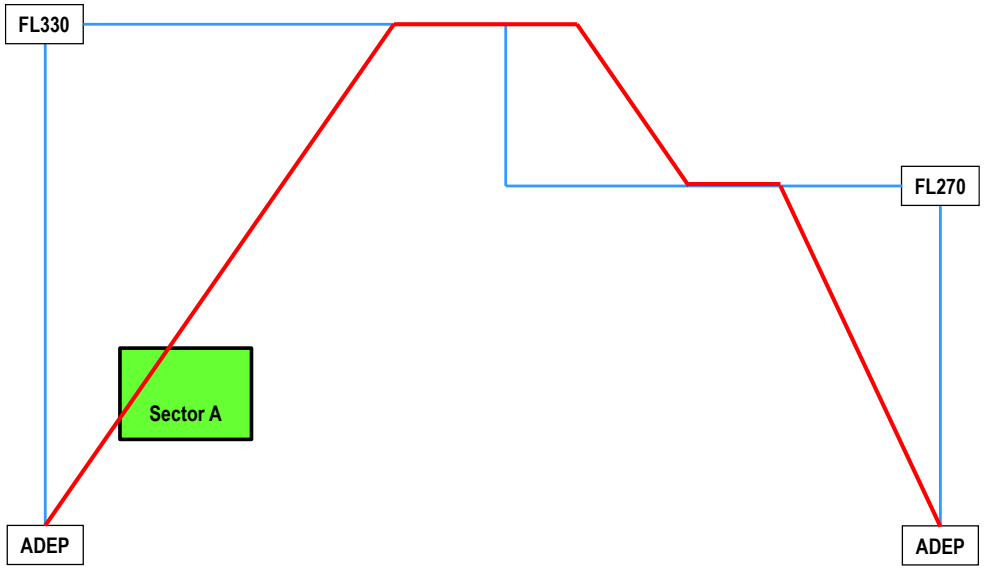


Figure 24: Example of PTR avoiding Airspace Volume

  - PTR profile (used to count traffic by ETFMS) follows the RFLs mentioned in the route description (Blue line). The PTRs are calculated before the flight plans are processed by the NM system. This means that PTRs can influence the complete process of a flight plan (e.g. all other Restrictions, counts etc.);
  - After processing the flight plan there is the IFPS/ETFMS profile (Red line).
  - It is important to know that creating PTRs looks at the RFLs and not at the calculated profile.
- Avoiding Airspace Volume, the profile has to be below the relevant Airspace Volume (Green line) for the Airport of Departure (ADEP) as shown on Figure 25.
- Considering Airspace Volume as Reference Location is not enough as the PTR profile is already above (Blue line) and the PTR will not capture any traffic.
- A good option is to take the entire Airspace Volume (Green + Pink volumes) (FLR - UNL). In this case, the traffic will be captured by the PTR and the IFPS / ETFMS profile will be affected (see red line).

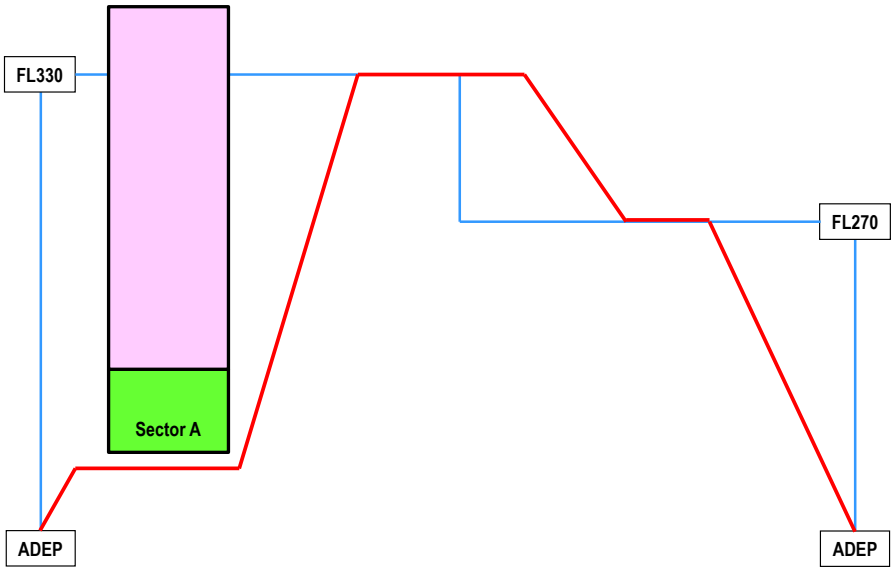


Figure 25: Example of PTR avoiding Airspace Volume

g) **PTR "extension"**

- To avoid "yoyo" flight profiles, ETFMS may artificially extend the forbidden FLs of a PTR toward the ADEP or ADES. This happens when all the following conditions are met:
  - The ADEP or ADES is a positive Flow Condition of this PTR;
  - The FLs of the forbidden Flow Routing element(s) go up to UNL (no extension is done if for example FL660 is used);
  - The ADEP or ADES is less than 200 km away from the forbidden Flow Routing element(s).
- This "PTR extension" is shown on the vertical view by extending up to the ADEP or ADES the orange area representing the forbidden Flow Routing element(s).

  Note: If PTRs are pushing flights (profiles) into the restrictions and flight plan is rejected, AO should advise NMO to tactically resolve it.

3.7 EU / EURO Restriction

3.7.1 Purpose

(1) A temporary (duration of few hours, daily, weekly) or seasonal airspace related information and/or other information influencing the air navigation is considered either as "EU" or "EURO" restriction.

3.7.2 Creation

(1) EU / EURO restrictions are created in CACD by the NM Airspace Data Team based on proper request by relevant State / FAB / ANSP National Environment Coordinator (NEC).

(2) "EU" restrictions are created for:

a) Major Military exercise/s[1];

b) Special event/s;

[1] See paragraph 3.3.3.

c) Industrial action/s;

d) Contingency plans;

e) Crisis management;

f) Temporary RSA.

(3) And published via:

a) AIP Supplement/s;

b) Aeronautical Information Circular/s (AIC/s);

c) NOTAM/s.

(4) "EURO" restrictions are created for Traffic Flow Restrictions published in AIP (ENR part), including restrictions supporting FLOS definitions.

Example: EUROLIBB1A: FROM: ELSAG, CROSSING: LIBBCTA, TO: VAPUP XOLTA GOKEL PAPIZ, NOT AVBL: FL 380,360,340.

(5) EU / EURO restrictions are marked as Forbidden (F), Mandatory (M) or Closed (C) and could also be considered as Active and non-Active, which are live updated, based on sources received by the States/ANSPs (NOTAM, AIP SUP, AUP/UUP etc.)

3.7.3 Publication

(1) EU / EURO restrictions as all other AURA restrictions / limitations are available via B2B in AIXM format.

3.7.4 Usage

(1) EU / EURO restrictions are used by IFPS to validate/invalidate flight plans and by the path finder to generate valid route/s.

(2) For flight plan processing purposes "EU" and "EURO" restrictions are technically qualified as "Hard Traffic Flow Restrictions". Flight plan checking against "EU" and "EURO" restrictions is handled in the same way as against RAD traffic flow rules. For EURO Restrictions the Textual Description must always refer to the AIP page where the information is published.

(3) Similarly to FUA restrictions (see Chapter 4), EU restrictions can have a dependent applicability based on an RSA allocation in an AUP / UUP, in which case they inherit its activation times and vertical limits.

3.8 Dynamic RAD

3.8.1 Purpose

(1) The main goal is to allow a temporary change of RAD measures whenever it is required, with concrete benefits in terms of flight efficiency. The dynamic RAD restrictions are known as AUP/RAD restrictions in the NM system.

(2) In principle, any RAD restriction could be eligible for a dynamic management, especially if able to improve flight efficiency (e.g. level capping, mandatory rerouting, safety).

3.8.2 Creation

(1) The CACD contains as well the AUP/RAD restrictions selected by the national RAD coordinators to be processed via AUP/UUP.

(2) AUP/RAD Restrictions are RAD restrictions published in RAD Annexes (States are responsible), not linked with any RSA/FBZ/NPZ structures and published in the national AUP/UUP. The main goal of establishing AUP/RAD Restrictions is to allow a temporary change of RAD measures whenever it is required, with concrete benefits in terms of flight efficiency. In principle, any RAD Restriction could be eligible for a dynamic management as AUP/RAD Restriction if able to improve flight efficiency (e.g. level capping, mandatory rerouting, safety). AUP/RAD Restrictions are published in the RAD document and their identification coding is described in ERNIP Part 1, chapter 8.

(3) The decision of which RAD restrictions are eligible for a dynamic management is an ANSP responsibility. When necessary, NM could support the States to analyse the possible impact of introducing dynamicity to selected RAD restrictions. This support could be more relevant in case of cross-border restrictions, where NM can facilitate coordination among interested ANSPs. AOs and CFSPs could play a beneficial role when establishing the RAD Restrictions to be dynamically managed by AUP/UUP process.

3.8.3 Publication

(1) Dynamic RAD restrictions (i.e. AUP/RAD restriction) are published in the RAD document and their identification coding is described in ERNIP Part 1, chapter 8.

(2) In specific, for those selected dynamic RADs, the RAD document will contain the word DYNAMIC in the time availability/applicability column.

3.8.4 Usage

(1) The CACD contains as well the AUP/RAD restrictions selected by the national RAD coordinators to be processed via AUP/UUP.

(2) AOs should flight plan according to the change of the AUP/RAD restrictions published via EAUP/EUUP. The EAUP/EUUP publication will reflect the conditions described in the RAD document

Note: The Dynamic RAD concept will be operational as from December 2024. Currently, the technical enabler for the concept is only used for trials.

3.9 Aerodrome Flight Rule Restriction

3.9.1 Purpose

(1) The Aerodrome Flight Rule restriction defines under which specific flight rules arrivals to, or departures from, particular Aerodromes must be conducted.

(2) The Aerodrome Flight Rule restriction is used to forbid flights to be conducted in IFR to/from a specific Aerodrome and has no impact on ETFMS.

3.9.2 Creation

(1) Aerodrome Flight Rule restrictions are created in CACD by the NM Airspace Data Team based on proper request by relevant State / FAB / ANSP National Environment Coordinator (NEC). States / FABs / ANSPs require that departing

from and/or arriving at an aerodrome, which has no IFR equipment, must be done under VFR and that this information is present in the flight plan route description(e.g. ICAO FPL Item 15).

3.9.3 Publication

(1) The Aerodrome Flight Rule restrictions as all other AURA restrictions / limitations are available via B2B in AIXM format.

3.9.4 Usage

(1) The Aerodrome Flight Rule restriction has the below parameters defining its usage. Any textual description is optional for this restriction.

a) **Operational Goal**

- "Aerodrome Flight Rule restriction on AAAA'", where AAAA is the relevant Aerodrome's ICAO location Indicator.

b) **Flow Routeing**

- No Flow Routeing Element.

c) **Flow Conditions**

- It is a fixed set of conditions;
- The concerned Aerodrome serves as departing and/or arriving Flow condition, and Reference Location.

(2) IFPS invalidates a flight plan if it does not reflect the correct flight rules on the last segment before the aerodrome of destination or first segment after the aerodrome of departure. Flight plans that have IFR indicated for the last segment to, and/or the first segment from the restricted Aerodrome will be invalidated by IFPS and an error message is generated.

(3) IFPS invalidates those flight plans that are non-compliant on the first/last segment according to the rules laid down in

3.10 Flight Property Restriction on Terminal Procedures

3.10.1 Purpose

(1) The Flight Property Restriction on Terminal Procedures defines when the use of terminal procedures is often restricted to given flight property conditions such as aircraft type/classification (e.g. "propellers only" or "jet only"), type of flight (e.g. military), aircraft equipment (e.g. ILS).

(2) The Flight Property Restriction on Terminal Procedures allows IFPS and the ETFMS profiler to select more accurately the most suitable Terminal Procedure for a flight. In case no suitable Terminal Procedure is found after this selection, the concerned flight plan may be invalidated due to exceeded maximum DCT limit as defined for that Aerodrome. It should be noted that in this case the error is triggered by the Aerodrome DCT Limitation Restriction and doesn't refer to the Flight Property Restriction on Terminal Procedure.

3.10.2 Creation

(1) Flight Property Restrictions on Terminal Procedures are created in CACD by the NM Airspace Data Team based on proper request by relevant State / FAB / ANSP National Environment Coordinator (NEC).

(2) The Flight Property Restriction on Terminal Procedures is not a stand-alone Restriction but rather additional information belonging to the relevant Terminal Procedure. When such a Restriction is created, the affected Terminal Procedures automatically indicate that this is the case. This restriction is published in National AIP (usually in SID/STAR charts) and is implemented on request of the ANSP.

3.10.3 Publication

(1) The Flight Property Restrictions on Terminal Procedures as all other AURA restrictions / limitations are available via B2B in AIXM format.

3.10.4 Usage

(1) The Flight Property Restriction on Terminal Procedures has the below parameters defining its usage.

a) **Operational Goal**

- "Aircraft type/classification Restriction on SID/STAR for AAAA", where AAAA is the relevant Aerodrome's ICAO location Indicator.

b) **Textual Description**

- It is optional and should include a clear reference to the source of the data, such as an AIP page.

c) **Flow Routeing**

- It can be forbidden or mandatory;
- Only the Terminal Procedure(s) for which the Aircraft type / Classification condition applies may serve as Flow Routeing Element.

d) **Flow Conditions - Reference Location**

- The concerned Aerodrome serves as Reference Location;
- It is combined with a Flight Property Condition through the operand 'AND/AND NOT'.

e) **Flow Conditions - Flight Property Conditions**

- It is composed of Flight type, Aircraft Classification/Type, Aircraft equipment;
- Flight Type Condition element is normally not used for this type of Restriction.

(2) When selecting a suitable Terminal Procedure to be inserted in a flight plan, or when validating a flight plan containing a Terminal Procedure, IFPS verifies if it is allowed for the aircraft type found in Item 9:

- If it is allowed then possibly use the Terminal Procedure if it complies with the other criteria of selection;
- If it is not allowed then skip this Terminal Procedure for selection, or invalidate the flight plan if it was already mentioned;

- Produce an error message stating SID (or STAR) is not valid.

3.11 Non-standard Planning Zone/s (NPZ)

Purpose

(1) When and where required to prevent inappropriate flight trajectory airspace crossings or to properly manage ATC operationally sensitive areas inside or across relevant FRA area/s establishment of Non-standard Planning Zone/s (NPZ) might be considered in accordance with provisions in ERNIP Part 1, Chapter 9.

(2) Within the airspace volume representing such zone the planning of flight trajectory is either not permitted or allowed under certain specified conditions. In order to assist the airspace users in the presentation of the intended flight operation, the flight planning limitation/s shall be defined in the Route Availability Document (RAD).

(3) When required, airspace users can avoid such zone by flight planning via appropriate significant points around it or in accordance with allowed conditions.

3.11.2 Creation

(1) Non-standard Planning Zone (NPZ) is airspace of defined dimensions within which the planning of flight trajectory is either not permitted or allowed under certain specified conditions.

(2) Within the Free Route Airspace, NPZs will be implemented, if necessary, to enhance traffic organisation at flight planning level. NPZ contains all the characteristics of a RSA when defined in NM systems and managed via AUP/UUP. They are to be classified as AMC-manageable area (AMA) or non-AMC-manageable area (NAM) according to the flexibility offered and managed by the relevant AMC via AUP/UUP. Being defined exclusively for the management of flight plans, the relevant FMPs will be responsible to coordinate with AMCs for their notification via AUP/UUP.

(3) NPZ are published in the AIP “ENR 2.2 Other regulated airspace”. They are created in the NM system on the request of the AMC/FMP and are designated as AMA/NAM.

(4) The FMP shall pass the request for an FUA restriction to relevant State / FAB / ANSP National RAD Coordinator (NRC) for publication in the RAD Annex 2C.

3.11.3 Publication

(1) The associated FUA restriction for a NPZ is published in RAD Annex 2C.

(2) FUA restrictions as all other RAD traffic flow rules are published as xls file via NOP RAD Portal, RAD Home in accordance of ERNIP Part 1, Chapter 8 provisions. The xls file of Annex 2C is the only official containing the correct information to be used in flight planning.

(3) The associated FUA restriction to a NPZ is also defined and published via the EAUP / EUUP.

3.11.4 Usage

(1) NPZ are used by IFPS to validate/invalidate Flight Plans and by the Path Finder to generate valid routes. A basic FUA restriction will invalidate flight plans that have a profile calculated to be inside the airspace volume of the concerned area when it is activated in an AUP / UUP.

3.11.5 Identification of Non-standard Planning Zone (NPZ)

Note: For identification of NPZ refer to ERNIP Part 1, Chapter 9.

4 Airspace Management

4.1 Purpose

(1) The purpose of this Chapter is to describe the ASM entities expression and processing by NM systems.

(2) It supplements the ERNIP Part 3 Procedure for Airspace Management - The ASM Handbook and it focuses on those elements relevant for flight planning processes.

(3) In specific:

- FUA Concept
- Airspace structures
  - ATS Routes
    - Permanent
    - Conditional
  - Areas
    - NAM
    - AMA
- Airspace data management
- FUA/EU Restriction
- FBZ
- FUA process
  - AUP/UUP
- Notification Process
  - EAUP/EUUP
  - ASM Booklet
- Contingency Procedures

4.2 FUA Concept

(1) The basis for the FUA concept is that airspace should no longer be designated as either military or civil airspace but should be considered as one continuum and used flexibly on a day-to-day basis. Consequently, any necessary airspace segregation should be of a temporary nature.

(2) Effective application of the FUA concept requires the establishment of a national High-Level Airspace Policy Body (HLAPB) in each of the ECAC States. This body is tasked with the continuous reassessment of national airspace, the progressive establishment of new flexible airspace structures and the introduction of procedures for the allocation of these airspace structures on a day by day basis. The States are required to establish adequate real time civil/military coordination facilities and procedures so as to fully exploit the FUA concept. The practical application of the FUA concept relies on National or sub-regional Airspace Management Cells (AMCs) for the daily allocation and promulgation of flexible airspace structures and on the Centralised Airspace Data Function (CADF) within the Network Manager (NM). NM is in charge for the dissemination of the daily availability/unavailability of ATS routes and daily allocation of areas, including associated information (e.g. restrictions,

mandatory intermediate points, etc.), particularly relevant in the Free Route Airspace. ATC Units, civil and military are responsible for the tactical management, including activation/de-activation, tactical re-routings and shortcuts through areas.

4.3 Airspace Structures

(1) In relation to flight planning processes, the basic airspace structures managed through the FUA process are ATS route and areas. In addition, the process implies the management of specific entities such as FBZ, treated as areas, and FUA/EU restrictions. They are described in specific chapters.

(2) For the publication of the upper and lower limits of ATS routes and military exercise and training areas and air defence identification zones (ADIZ) in their AIPs States should apply the criteria described in ERNIP Part 1, Chapter 9 . In specific for the areas, FLs should be used for the description of vertical limits above the Transition Altitude; the identified FLs should consider the local QNH variations historically registered.

(3) The publication of areas' activation time, the system used and means of activation announcements and whether AMC Manageable or not should be provided according to the guidelines described in ERNIP Part 1, Chapter 9.

(4) The publication of availability time for ATS routes in the national AIPs should apply the criteria described in ERNIP Part 1, Chapter 9. The aim is to provide clear and unambiguous information of the ATS route classification H24 (e.g. when permanent ATS, CDR1, etc.)

4.3.2 ATS Routes

(1) Under ICAO provisions, an ATS route is a specified route and for the provision of air traffic services.

(2) A Permanent ATS Route is therefore a permanently designated route, which is not subject to daily management at ASM Level 2 by AMCs. Nevertheless, a Permanent ATS Route can be temporary closed, but only under specific conditions specified at ASM Level 1 and published by AIS publication (e.g. NOTAM), e.g. for large scale military exercises. Its closure should be also notified via EAUP/EUUP.

4.3.2.1 Conditional Routes (CDR1s)

(1) A Conditional Route (CDR) is an ATS route or a portion thereof, which can be planned and/or used under certain specified conditions only. CDR1s permit the definition of more direct and alternative routes by complementing and linking to the existing ATS route network.

(2) CDR1s can be established at ASM Level 1:

- through areas of potential temporary reservations (e.g. TRA or TSA), with opening/closure conditions resulting from associated military activities; and/or
- to address specific ATC conditions (e.g. traffic restrictions or ATC sectorisation compatibility) with opening/closure conditions resulting from purely civil needs.

(3) The properties of CDRs, including their categories, alignment and route designator, are published in State AIPs.

(4) CDRs are divided into different categories according to their estimated availability and flight planning possibilities. A CDR can be established at ASM Level 1 in one or more of the three following categories:

a) **CATEGORY ONE (CDR1) - Permanently Plannable CDR**

- CDRs1 are available for flight planning during times published in the relevant State AIP.
- When a CDR is expected to be available for most of the time, it should be declared as permanently plannable for stated time periods and published as a CDR1 in AIPs. CDRs1 can either be established on an H24 basis or for fixed time periods or at fixed FL bands.
- The unavailability of a CDR1 (or any portion thereof) for flight plan purpose, has to be published via AUP/UUP and promulgated via EAUP/EUUP. It remains a State responsibility to decide whether an AIS notification (e.g. NOTAM) is required as additional publication. In case an additional AIS notification is published, States are responsible for ensuring consistency between relevant publications (e.g. NOTAM and AUP/UUP information). Any unavailability of a CDR1 not affecting flight planning can be treated tactically when appropriate. Even in case of notified unavailability of CDR1 for flight planning tactical utilisation may be granted, based on defined tactical coordination procedures between responsible ATS and/or controlling military units whenever applicable.

Notification

CDR1s are plannable as permanent ATS routes during the times published in AIPs. In the event of a short notice unavailability of a CDR 1, aircraft will be tactically handled by ATC. Aircraft operators should consider the implications of such a possible re-routing and/or use of the alternate ATS routes published for each CDR 1 in the “Remarks” column of the AIP.
Any CDR1 unavailability for flight planning is published in the AUP/UUP and notified to the operators by EAUP/EUUP, via NOP portal and eAMI for those using B2B service. In such case, any flight plan which uses the CDR1 portion during the affected period is to be cancelled or changed in accordance with the procedures laid down in the IFPS User’s Manual (rejection or FLOS messages are generated by IFPS to advise airspace users about the incorrectness of the routing described in the flight plan). It remains a State responsibility to decide whether an AIS notification (e.g. NOTAM) is required in addition. In this case, State is responsible to ensure consistent information. The most appropriate UUP should be used to publish the cancellation of the any CDR1 unavailability from list “BRAVO”. If any NOTAM has been published, it is a State responsibility to issue a new NOTAM to align the information with the UUP. Any additional closure of CDR1, after the AUP publication, is notified via UUP (inclusion in List BRAVO of UUP), respecting the lead-time of Three (3) hours before its validity.

CATEGORY TWO (CDR2) - Non-Permanently Plannable CDR -disbanded-

CDRs2 may be available for flight planning. Flights may only be planned on a CDR2 in accordance with conditions published daily in the EAUP/EUUP.

CDRs2 form part of predefined routeing scenarios depending on the allocation of associated AMC Manageable Areas or for addressing specific ATC conditions.

CDRs2 availability can be requested to adjust traffic flow, when a capacity shortfall has been identified and after consideration of relevant ATC factors by the FMPs/ACCs concerned.

CDR2 when not available according to EAUP/EUUP publication may also be managed tactically, whenever conditions allow short-notice usage, subject to preventive coordination between responsible ATS and/or controlling military units.

Notification

Flights on CDRs2 can only be planned when the CDRs are made available through AUP/UUP. In this respect, the UUP could also notify the closure of CDR2 declared available in AUP and/or previous UUPs. The CDR2 closure is notified by deleting the (available) CDR2 from the list “ALPHA” of previous AUP/UUP and notified to the AOs by EAUP/EUUP, via NOP portal and eAMI for those using B2B service.

Whenever an operator wishes to take advantage of particular available CDRs2 or is required by the ANM to use particular CDRs2, an individual flight plan should be submitted. It should contain in Item 15 the available CDRs2 to be followed.

The flight planning systems of aircraft operators or flight planning agencies should be able to process eAMI in AIXM format so as to automatically process the CDRs availability information (B2B service).

In addition, and in order to assist AOs in assessing the routeing options, an "Aircraft Operator What-if Reroute" function (AOWIR) has been established by the NM. For more details see ERNIP Part 3 – ASM Handbook chapter 4.7.5 and NM IFPS User manual chapter 70.

In case of an ATFCM slot that prevents the CDR2 usage, the flight plan is to be changed to use an available ATS route. The revised flight plan may result in a revised ATFCM slot.

CATEGORY THREE (CDR3) - Not Plannable CDR

CDRs3 are not available for flight planning. Flights must not be planned on these routes but ATC units may issue tactical clearances on such route segments, when made available.

CDRs3 are those CDRs that are expected to be available at short notice when the pre-notified activity in the associated AMC Manageable Areas has ceased, or for addressing specific ATC conditions.

After coordination with the ATS or controlling military unit(s) in charge of the associated AMC Manageable Area(s), the responsible controller may offer an aircraft a short-notice routing through the area using a predefined CDR3. CDRs3 are published in AIPs as CDRs usable on ATC instructions only and are not subject to allocation the day before by AMCs.

(5) Whenever the Path Generator (see more details in chapter 6) provide new rerouting based on the CDR1s availability, the information about the expiring validity of the proposed rerouting will take into consideration the CDR1s time window availability.

(6) In case of cross-border CDR1s, a Lead AMC should be identified, responsible for the publication of all segments across boundaries. These are classified in the CACD as "Related Routes". The Lead AMC creates their national AUP/UUP for all the cross-border CDRs according to the agreement, including the appropriate route extension within neighbouring FIR/UIR(s). Therefore, an AMC not designated as Lead AMC shall not include any information in its national AUP/UUP on a cross-border CDR1 for which a Lead AMC is defined.

(7) Being impossible to disable the allocation of the CDR1 segment within the NAS of the AMC not designated as Lead AMC, a warning message has been introduced to prevent double publication with potential inconsistencies. No matter which AMC starts the input (AUP/UUP) the other AMC will get a warning, who's ever AUP is in higher status will trigger the warning for the other AMC AUP/UUP when they will promote or validate theirs. In case the warning is received by Lead AMC, Lead AMC should take initiative and coordinate with AMC who changed availability of related route.

(8) In CACD, in addition to the ATS routes crossing the RSA, derived automatically by NM system (e.g. CIAM), there are 3 possibilities for the CDR1 Info. This data is provided by the lead AMC, normally through the National Environment Coordinator (NEC).

(9) The purpose of this data is to fine-tune the proposals of CDR expansion made by CIAM when the concerned RSA is allocated or expanded in the AUP/UUP.

Nearby CDRs

Nearby CDRs are:

- CDR1 or ATS route segments (Route, From PT, To PT, Lower FL, Upper FL) that CIAM will propose to close in the AUP/UUP when the RSA is allocated, in the same way as it proposes to close the crossing segments;
- Generally route segments preceding or following a crossing segment that it would not make sense to leave open when the crossing segment is closed, or route segments very close to the RSA but not effectively crossing it (in particular due to the fact that CIAM only considers the ATS route centreline, as if the ATS route was 0 NM wide…).

Excluded CDRs

Excluded CDRs are:

- CDR1 or ATS route segments (Route, From PT, To PT) physically crossing the RSA but that CIAM will consider as not crossing the RSA. As a consequence, CIAM will not propose to close these CDRs in the AUP/UUP when the RSA is allocated or expanded;
- Generally ATS route segments crossing the RSA but managed tactically by the AMC, and which do not require a closure by NOTAM.

Note that Excluded CDRs do not include a FL band, which means that the full vertical limits of the route overlapping with the concerned RSA are concerned.
An Excluded CDR can still be entered in the 'Manual CDRs' tab of the AUP/UUP if required.

Note: Offload CDRs - The offload route option becomes obsolete as all CDR2 have been removed.

4.3.3 Areas

(1) In CACD airspace volumes known as areas are named as Restricted Airspaces, coded by using abbreviation RSA, are divided into two system types: Elementary RSA (ERSA) and Composed RSAs (CRSA).

(2) Both ERSA and CRSAs are further divided into 9 RSA types, which correspond to the classification of these Airspaces according to the official State AIP publications (except MRA and MTA , used for CACD purposes and do not correspond to any guideline for AIP publication):

- Danger Area (D);
- Restricted Area (R);
- Prohibited Area (P);
- Temporary Reserved Area (TRA);
- Temporary Segregated Area (TSA);
- Reduced Coordination Airspace (RCA);
- Military Reserved Area (MRA);
- Military Training Area (MTA);
- Cross Border Area (CBA).

(3) Specific constraints for Composed RSAs (CRSAs):

- A Composed RSA (CRSA) must have the same RSA Type as one of its composing Elementary RSA (ERSA);

Note: For identification of airspace volumes refer to ERNIP Part 1, Chapter 9.

4.3.3.1 AUP Categories for RSA in CACD

(1) For all the areas inserted in the CACD, there are 4 possible values of Airspace Use Plan (AUP) category, which are derived from the FUA parameters:

- AMA (AMC manageable): areas which can be allocated in a flexible way under the responsibility of only one AMC at each time. These RSAs can be of two categories:
    - AMA with AMC Flag on (negotiable): areas which can be allocated in a flexible way after due coordination/negotiation between AMCs and relevant Approved Agencies. NM can provide advice on possible adaptation of the areas if relevant for the network.
    - AMA with AMC Flag off (not negotiable): areas which can be allocated in a flexible way but not subject to coordination/negotiation between AMCs and Approved Agencies. NM is not entitled to provide advice.

  Note: These categories are not applicable to those RSA types that in the table described in paragraph 4.1.4 with only "N" for FUA level 2 parameter, namely Prohibited areas (P) that can only be NAM.

- NAM (Non-AMC manageable): areas, which are allocated to interested airspace users without prior coordination/negotiation with the AMC.

- RCA (Reduced Coordination Airspace): airspaces in which civil air traffic control can allow flights to deviate from the published route structure (using a DCT) with limited or no prior coordination and owned by one and only one AMC.
- Blank: airspaces for which a standard coordination agreement exists and which are never mentioned in the AUP. These airspaces (Danger, Restricted and Prohibited Areas) shall be displayable in the CACD, but shall not be considered for AUP processing.[2]

  The first two categories are those managed via AUP/UUP end notified via EAUP/EUUP.

(2) Both AMA with AMC capability of negotiation and AMA with NO AMC capability of negotiation are AMA and SHALL be allocated daily via AUP, otherwise they will NOT be activated in the NM system, therefore flight plans will be accepted through those RSAs.

	Action	**AMA/AMC Negotiable**	**AMA/NOT AMC negotiable**	**NAM**	**NAM** activated by NOTAM[3]
1.	Area activation	AMC	AMC	by default	CADF Staff to insert availability time (on request from the AMC) or times delivered by AUP
2.	Area de-activation	AMC. (Do nothing if the RSA already not active)	AMC. (Do nothing if the RSA already not active)	CADF Staff to insert availability time as "empty" (on request from the AMC)	Do nothing if time availability is empty. If previously time availability inserted, CADF Staff to insert availability time as "empty" (on request from the AMC)
3.	FUA restriction from ON to OFF	AMC	AMC	AMC	AMC (once the area is active, see point 1.)
4.	Reduce availability time	AMC	AMC	AMC	AMC (once the area is active, see point 1.)
5.	Extend availability time	AMC subject to and in accordance with NOTAM (for temporary extension)	AMC subject to and in accordance with NOTAM (for temporary extension) CADF Staff according to AIRAC cycle (for permanent changes or	AMC subject to and in accordance with NOTAM (for temporary extension) CADF Staff according to AIRAC	CADF Staff (on request from the AMC) AMC subject to and in accordance with NOTAM (once the area is active, see

[2] Blank airspaces cannot have a FBZ nor a NPZ associated to them.

[3] Possibility to modify the NAM's which are likely to be activated differently from their default as AMA AMC Manageable Areas.

		CADF Staff according to AIRAC cycle (for permanent changes or temporary changes notified via AIP Supplement)	temporary changes notified via AIP Supplement)	cycle (for permanent changes or temporary changes notified via AIP Supplement)	point 1. For temporary extension) CADF Staff according to AIRAC cycle (for permanent changes)
6.	Reduce vertical limits	AMC	AMC	AMC	AMC (once the area is active, see point 1.)
7.	Extend vertical limits	AMC subject to and in accordance with NOTAM (for temporary extension) CADF Staff according to AIRAC cycle (for permanent changes or temporary changes notified via AIP Supplement)	AMC subject to and in accordance with NOTAM (for temporary extension) CADF Staff according to AIRAC cycle (for permanent changes or temporary changes notified via AIP Supplement)	AMC subject to and in accordance with NOTAM (for temporary extension) CADF Staff according to AIRAC cycle (for permanent changes or temporary changes notified via AIP Supplement)	AMC subject to and in accordance with NOTAM (once the area is active, see point 1. For temporary extension) CADF Staff according to AIRAC cycle (for permanent changes)
8.	Reduce horizontal limits	AD SPVR (AIRAC cycle)	AD SPVR (AIRAC cycle)	AD SPVR (AIRAC cycle)	AD SPVR (AIRAC cycle)
9.	Extend horizontal limits	AD SPVR (AIRAC cycle)	AD SPVR (AIRAC cycle)	AD SPVR (AIRAC cycle)	AD SPVR (AIRAC cycle)

Table 47: Comparison between AMA, AMA/NOT AMC negotiable and NAM in terms of management in NM System

Note: NOTAM publication and coordination via e-mail (ref nbr NOTAM) required with CADF position before updates will be done in CACD concerning NAM areas, see item 1 / 2 / 4 / 5 and 6 of table above.
Note: Publication in AIP to be updated and e-mail (using data-submission for for ASM related data) to request modification in CACD.
Note: As described in the table before, the processing of AMAs, AMC negotiable or NOT, is the same. The information is only to facilitate the CDM process.

4.3.3.2 RSA Data Management

(1) Manageable or Restricted Areas represent a part of the airspace where General Air Traffic (GAT) can be restricted. In practice, it corresponds in most cases with airspace where military operations may take place.

(2) CACD data only includes Restricted Areas (RSAs) after coordination with /request from the concerned AMC through the National Environment Coordinator (NEC).

(3) The coordination with the NEC depends on the internal agreement inside ANSP/STATE concerning the request of implementing RSAs in CACD. This coordination is needed to decide precisely which of the Restricted Areas published in AIPs are required in CACD, and to define CIAM-specific parameters for which the values are not published.

(4) For operational reasons, it could be possible to have in CACD RSAs data, namely vertical limits and time availability, different from those published in national AIS publications (e.g. AIP). This variation shall be officially requested by States concerned using the appropriate Template. This deviation is occasionally asked by States to facilitate the management of frequent temporary extension of vertical limits and time availability of related RSAs. According to the NM system business rules, AMCs are not allowed to allocate directly via AUP/UUP RSAs with different temporary limits without the modification (manually) of these limits in CACD by NM AD SVR. The procedures in place are complex and cumbersome due to the manual intervention required, with potential risks of mistakes. The adopted solution to have different limits by default aims to facilitate the coordination process between national AMCs and NM staff in case of frequent temporary modification of specific RSAs. It is important to highlight that these temporary extensions shall be supported by national AIS publications (NOTAMs). The NMOC staff is not performing the regular monitor of these AIS publications; therefore, States remain full responsible to ensure the proper required publication.

(5) It should also be noted that once Restricted Airspaces (RSAs) are defined in CACD database, an AUP is required daily for the concerned AMC.

4.3.3.3 RSA Allocation via AUP/UUP

(1) The RSA Activation includes a FL band (Lower/Upper FL), a start date and time, and the end date and time.

(2) RSA allocations from Released AUPs/UUPs are automatically propagated to the corresponding RSA Activation tables.

(3) It should be noted that RSAs with AUP category NAM (Non-AMC Manageable = Level 1 only) are generally not allocated explicitly in the AUP/UUP. In this case, the RSA is considered as implicitly allocated during its period of availability; in other words the RSA availability is the default allocation for a NAM.

For example, EGD26 is an RSA of type NAM (ASM Level 1 only) with an availability defined as H24 (as published in the State AIP or coordinated with the responsible AMC). It is normally not allocated in the AUP/UUP by the British AMC because it is not managed by them. However, implicitly this RSA appears in the each EAUP/EUUP as NAM, allocated from 06:00 to 06:00, according to the RSA Availability data.

(4) States in coordination with NM can identify those Non AMC manageable areas (P, D and R) they prefer to be regularly published via AUPs/UUPs. These areas should be published in the AUP/UUP list “DELTA”, with or without modifications compared with AIP publication. NM Systems retrieves automatically NAM information without modifications for the EAUP/EUUP publication.

(5) Remark 1. However, it should be noted that RSA activation alone in AUP/UUP does not ensure cross check and invalidation of the flight plans of the flights crossing the area volume of airspace when area is planned to be activated.

(6) Using CIAM CDR1 expansion function or a local ASM tool, AMC can identify and publish in AUP/UUP list of associated CDRs and define scenarios of their availability/unavailability in case the RSA is activated. Such scenarios should be defined well in advance, coordinated and pre-validated with CADF NMD.

(7) Remark 2. However, it should be noted that only those flight plans that consist of unavailable CDR1s (or portion of) in flight plan route description will be rejected or invalidated. The flight plans that do not consists of the unavailable CDRs (e.g. filing DCT trough active TSA/TRA) will not be captured by either two processes described above. For DCT described in RAD Annex 3B this is valid as well, unless a dependent applicability with the RSA is pre-defined. In this case, the flight plan filing the DCT will be rejected or invalidated. Even if the RSA will be partially allocated (level band), all the FLs of the DCT described in RAD Annex 3B will be affected.

(8) In order to ensure that the volume of the airspace of such TSA/TRA made active in AUP/UUP is effectively sterilised, AMC should coordinate with NMD CADF the implementation of required restrictions.

(9) As a result, the flight plan crossing the volume of the airspace of an active area will be rejected or invalidated in accordance with flight plan reprocessing process. More details about IFPS flight plan validation process are provided in chapter 5.

(10) There is a possibility to identify scenario for such area activations. By default, if no scenarios identified for the area, the relevant volume of the airspace will be fully sterilised.

(11) In areas where coordination procedures (including civil/military coordination procedures) and airspace crossing conditions permit, the airspace users are allowed to flight plan routeings through airspace reservations; therefore, no restrictions or ATS routes closure will be used.

(12) Even if allowed to file the flight plan through the RSAs, in some cases, tactical re-routeing could be provided if RSA is not available for crossing at that moment. The expected maximum additional length of a tactical re-routeing shall be promulgated through State AIS publications. In other cases, when such airspace is not available for crossing, alternative rerouting, including 5LNC (e.g. FRA environment) will be defined to facilitate flight planning clear of the airspace reservation and ensure required separation from the activity. The promulgation of these 5LNCs shall be ensured through State 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. 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.

4.4 FUA/EU Restrictions

4.4.1 Purpose

(1) FUA restrictions define the unavailability of airspace for flight planning, depending on the allocation of the respective airspace for military purposes.

(2) For ad hoc areas implemented for a temporary period (e.g. large scale exercises or special events), planned to be processed via AUP/UUP, an EU Restriction could be defined in the CACD system, if required. It will be managed as a FUA restriction.

4.4.2 Creation

(1) FUA restrictions are used for RSAs published in the AIP (i.e. AMA and NAM) and are only created by the CADF / AD Team on request of an AMC.

(2) The AMC shall pass the request for an FUA restriction to relevant State / FAB / ANSP National RAD Coordinator (NRC) for publication in the RAD Annex 2C.

(3) FUA restrictions are typically forbidden and the Forbidden Flow Routing is the same RSA used to define the Dependant applicability and used as Reference location. Military traffic is typically excluded, and Routes or DCTs across the RSA can also be excluded if required.

(4) EU restriction(s) shall be used as temporary ad-hoc solution for amendment of already published RAD annex 4, for:

- During the period when the NM RAD Team is not available; and
- When a new traffic flow rule and/or flight planning facilitation option is urgently required to be created.

4.4.3 Publication

(1) FUA TFRs are published as RAD Annex 2C.

(2) FUA restrictions as all other RAD traffic flow rules are published as xls file via NOP RAD Portal, RAD Home in accordance of ERNIP Part 1, Chapter 8 provisions. The xls file of RAD Annex 2C is the only official containing the correct information to be used in flight planning.

(3) RAD Annex 4 - Special Events and Crisis contains traffic flow rules and/or flight planning options of temporary nature. For the establishment of temporary areas (e.g. military exercise/activity) for which temporary restrictions are required, those shall be published in Annex 4 dedicated to the specific event. In these cases, the Annex can be published/updated up to D-2 before the event/s. “Last minute” changes will be managed through the “Increment File”.

(4) Information related to FUA/EU Restrictions established for temporary areas is published by AIP Supplement, AIC, or NOTAM and Annex 4 for Special Events. EU Restrictions are not published in the RAD, but are available via the NOP Portal on the NOP RAD Portal under “EU/EURO Restrictions” as an .xls file. The same information is also available via B2B.

(5) In case of urgent required FUA restrictions (Safety issue), an AMC can ask CADF to create an EU restriction, which will remain in CADF for 3 AIRAC’s (End date of requested EU restriction will be implemented). This will give the AMC the time to coordinate, if the request is a permanent FUA restriction, with the RAD coordinator for publication in the RAD document.

(6) The airspace allocation and associated FUA/EU restriction are also defined and published via the EAUP / EUUP.

4.4.4 Usage

(1) FUA/EU restrictions as all other RAD traffic flow rules are used by IFPS to validate/invalidate Flight Plans and by the Path Finder to generate valid routes. A basic FUA restriction will invalidate flight plans that have a profile calculated to be inside the airspace volume of the concerned area when it is activated in an AUP / UUP.

4.4.5 Specificities in Restriction Types

(1) An FUA restriction must have:

- A Reference location (an RSA or FBZ);
- Dependent applicability based on RSA or FBZ activation;
- A FUA Restriction ID starting with an RSA or FBZ ID and ending with the character 'R' (then S, T, U, V, W, X, Y. if there are multiple FUA Restrictions it should be followed by A,B,C..). (These letters won't be published in RAD Annex 2C).

The Flow Routing must equal the RL.

Note: In case of more than 8 FUA restrictions per RSA, the NM RAD team in coordination with the relevant NRC's and/or other NMOC Teams is authorised to use other letters starting with Q on reserved order (Q, P, M, N, etc…., but NO O and I).

(2) Note: For identification of FUA restrictions refer to ERNIP Part 1, Chapter 8.

(3) Due to their complexity of some FUA restrictions, for the implementation into the technical systems, a complex restriction requires the breakdown into basic restrictions utilising sub-codes for their identification. The RAD Annex 2C describes the complete FUA restriction using a single code.

(4) In the NM system (e.g. CACD) a complex FUA restriction is inserted as a list of sub-codes of the basic restrictions which together defines the complex restriction. These sub-codes will contain the FUA restriction code (e.g. EBTRA01S) followed by a letter starting from A (e.g. EBTRA01SA, EBTRA01SB, etc.). In these cases, the IDs of the areas/FBZs should be adapted to respect the maximum length of 10 characters including the letters for the associated restrictions.

(5) The main code and the related sub-codes shall be activated simultaneously by AMC and will be notified in EAUP/EUUP on the NOP Portal and via B2B (subject to technical change).

(6) IFPS validates the flight plans against all sub-restrictions. The rejection/suspension messages of flight plans infringing one or more sub-restrictions will report the related sub-code(s).

(7) As a special case of dependent applicability, the restricted object of a FUA restriction is the airspace volume which is at the same time the object for which determines the dependent applicability. These Traffic Flow Restrictions have a dependent applicability using an RSA activation, with Time and Vertical Limits calculated automatically (derived) by the system from the RSA activation.

(8) In the dependent applicability of the FUA restriction, the 'FUA Default Active' parameter (Yes/No) determines whether the FUA restriction is active by default when creating an AUP / UUP. If required, the resulting activation or non-activation of the FUA restriction in an AUP / UUP can be changed there by selecting or deselecting the corresponding checkbox.

4.4.6 Implementation of FUA / EU Restrictions in CACD and usage in CIAM

(1) RSA: FUA RS tab

In

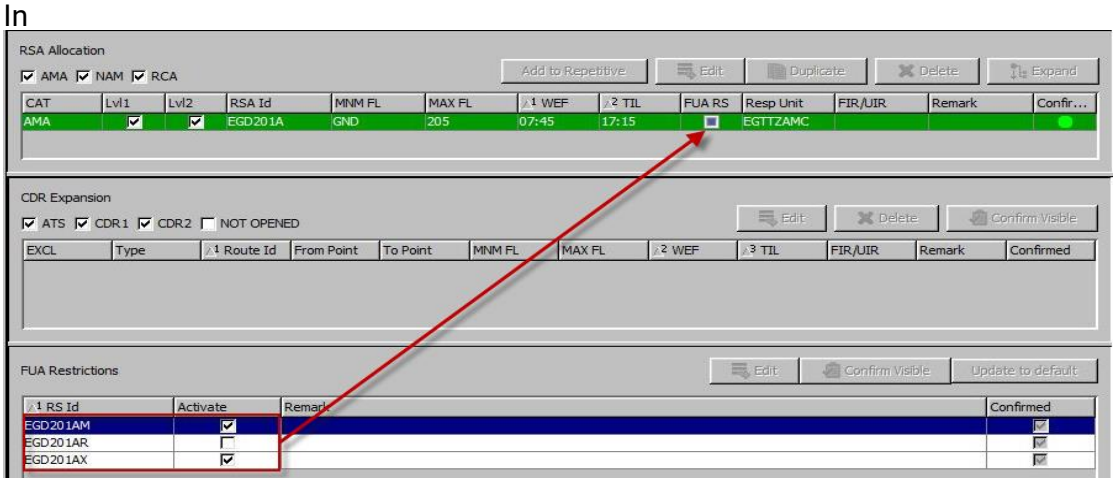


Figure 26 below, a FUA Restrictions have been created for the RSA EGD201E..

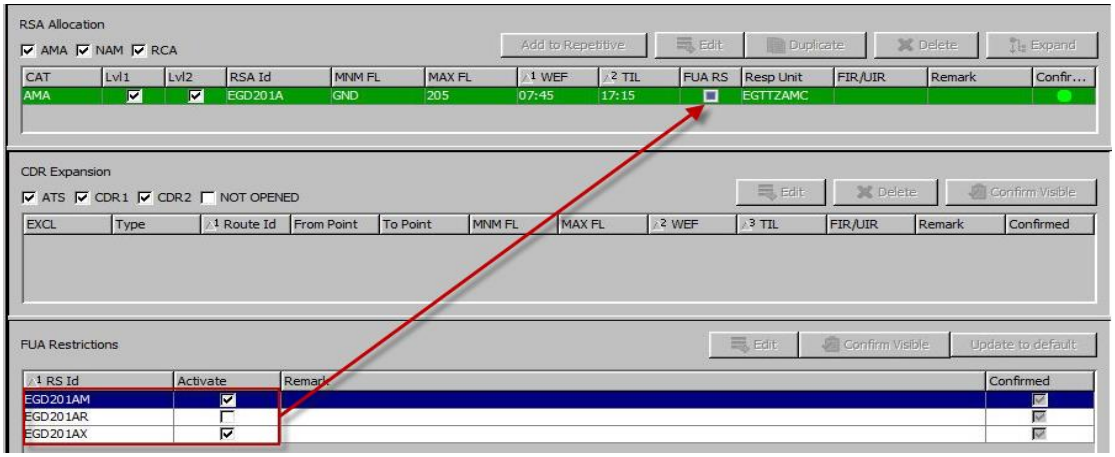


Figure 26: Example of FUA RS tab

(2) In the 'RSA Allocation' pane, the 'FUA / EU RS' column displays the following information:

- Blank: No FUA Restrictions associated with this RSA are active;
- Vink sign: FUA Restrictions associated with this RSA are active;
- Shaded square sign: Some, but not all, FUA Restrictions associated with this RSA are active.

(3) The activation of the FUA restrictions (as defined in the CACD) can still be overruled in CIAM or any other ASM tool by the AMC, and each restriction (even those not activated) must be confirmed by the AMC.

(4) FUA restrictions are also validated in CIAM, and warnings will appear if overlaps exist in 3D airspace volume or allocation time periods. This validation covers single AUP/UUPs and also cross-checks between multiple AUP/UUPs.

4.4.7 Multiple AS/RT for Restriction Dependent Applicability

(1) It is possible for a Restriction Dependent Applicability to reference more than 1 Restricted Airspace (TSA, TRA, CBA, D, R, P) or CDR.

(2) Addition of a composite dependent applicability table in Restrictions type H/S or PT.

4.4.7.1 How does it work?

- If FUA ='YES', no change, there can be only one Airspace allowed, it shall be the reference location of the Restriction (as per today)

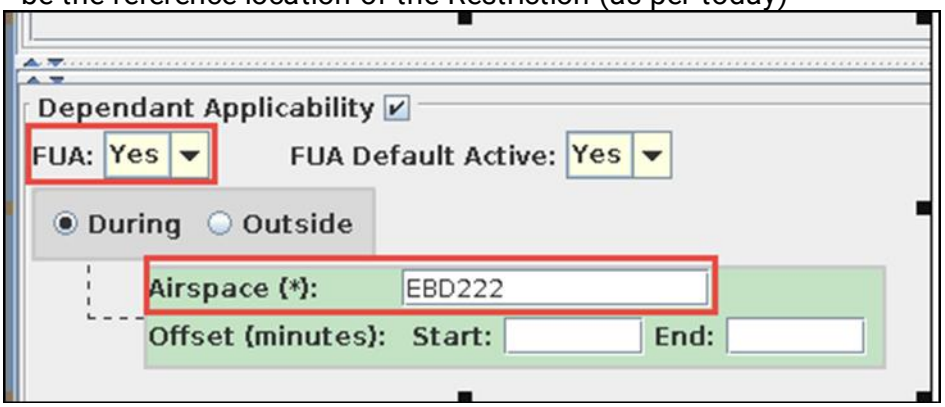


Figure 27: Example of FUA restriction with dependent applicability

- If FUA ='NO', there can be at least one airspace or at least one route

Note: in box Airspace, Airspace actually means "Airspace Activation"
In box Route Portion, Route Portion actually means "Route Portion Availability"

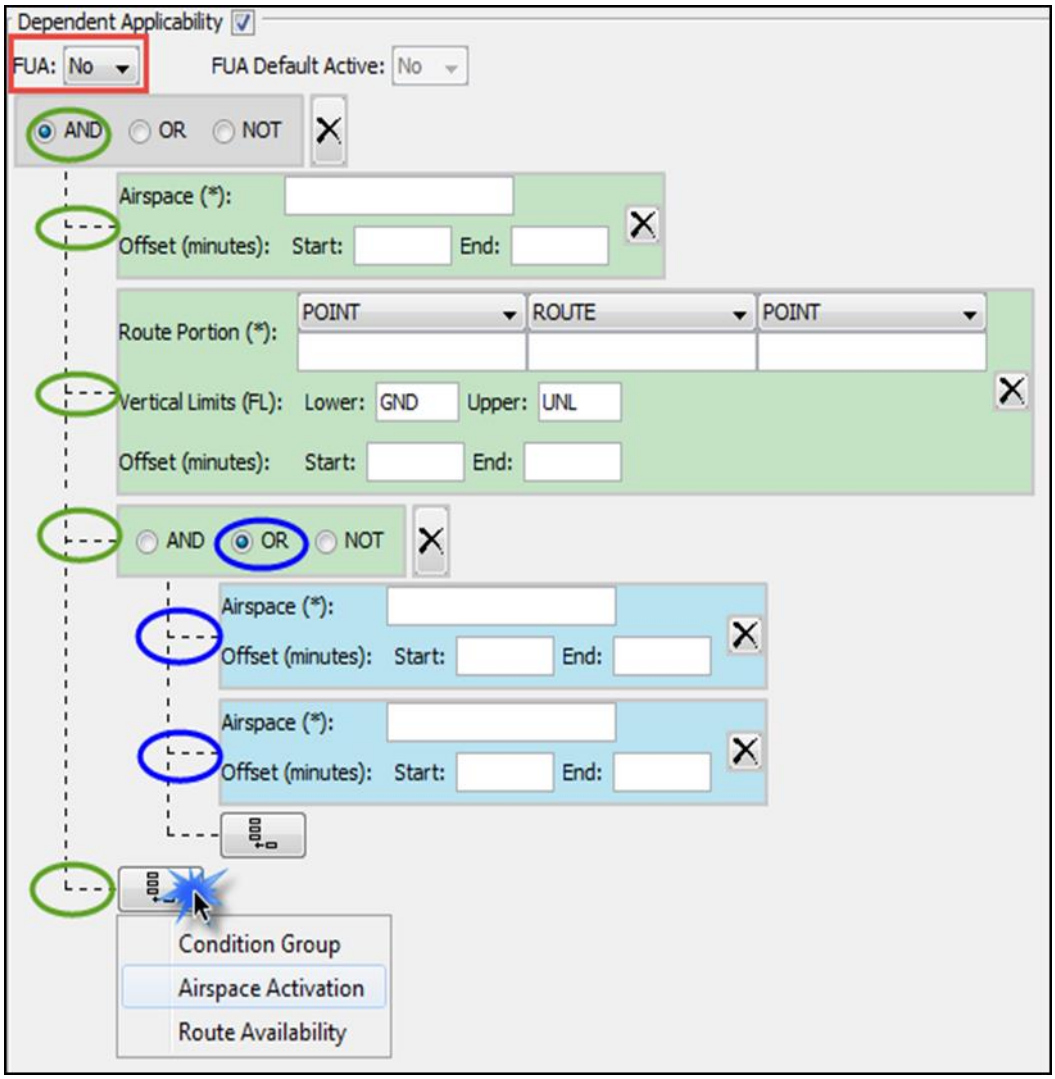


Figure 28: Example of FUA restriction with dependent applicability

- *When operation is 'AND', it means "active together", the dependent applicability corresponds to the intersection of the applicability derived for the combined element.*
- *When operation is 'OR', the dependent applicability corresponds to the union of the applicability derived for the combined element.*
- *When operation is 'NOT', it means "outside", the dependent applicability corresponds to the inversion of the applicability derived for the combined element.*

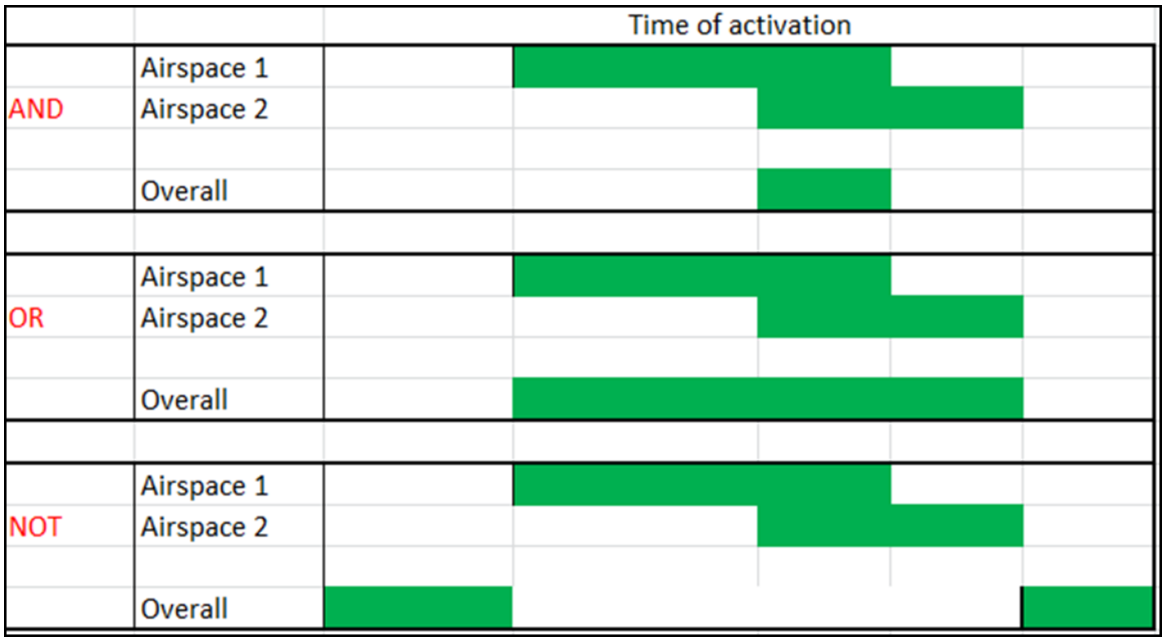


Figure 29: Example of FUA Airspace Activation

4.4.7.2 Specific constraints

(1) Vertical Limits within the Restriction are calculated automatically (derived) by the NM system ONLY if the Reference Location is the same RSA as used to define the Dependent Applicability.

4.5 FUA/RAD Restriction

4.5.1 Purpose

(1) FUA/RAD restriction is the restriction introduced in the CACD in order to manage the acceptance of flight plans *impacted* by the activation of a specific restricted/reserved area and/or associated FBZ.

4.5.2 Creation

(1) FUA/RAD restriction are published in RAD Annex 2A/2B/3A/3B, EU/EURO Restrictions and RAD Annex 4 – Special events and crisis, and are created for RSAs published in the AIP. They are only created by the CADF / AD Team on request of an AMC.

(2) The AMC shall pass the request for an FUA/RAD restriction to relevant State / FAB / ANSP National RAD Coordinator (NRC) for publication in the RAD Annex 2A/2B/3A/3B, EU/EURO Restrictions and RAD Annex 4.

(3) FUA/RAD restriction is a “Traffic Flow Restriction” managed via AUP/UUP for an associated RSA used to define the Dependant applicability.

4.5.3 Publication

(1) Whenever a State decide to establish a FUA/RAD restriction, the ID will be published in the RAD Annex 2A/2B/3A/3B, EU/EURO Restrictions and RAD Annex 4, according to the provision described in ERNIP Part 1, Chapter 8.

(2) FUA/RAD restriction established for temporary areas is/are published by AIP Supplement, AIC, NOTAM and Annex 4 on the RAD homepage, available via B2B and published via the NOP portal.

4.5.4 Usage

(1) FUA/RAD restriction as all other RAD restrictions are used by IFPS to validate/invalidate Flight Plans and by the Path Finder to generate valid routes.

4.5.5 Specificities in Restriction Types

(1) RAD Annex 2B/3B restrictions, which are associated to a FUA/RAD restriction, will have an identifier composed of maximum 9 digit alpha/numeric identifier which comprises the ICAO nationality letters for location indicators assigned to the State of origin or 2 letter Regional / FAB naming convention prefix code, together with an up to 5 digit number (LF50001, DU52345, RE54999, DSYX50000).

4.5.6 Difference between FUA Restriction and FUA/RAD Restriction and Dynamic RAD

FUA Restriction	FUA/RAD Restriction	AUP/RAD restriction
Airspace object • RSA • FBZ Note: traffic must cross the RSA/FBZ to be affected	Airspace object with dependant applicability • RSA • FBZ Note: traffic not necessarily crossing the RSA/FBZ is affected	Airspace object trigger zone used for time definition
Publication • RAD Annex 2C/4 • EU/EURO [4]	Publication • RAD Annex 2A/2B/3A/3B/4 • EU/EURO [2]	Publication • RAD Annex 2A/2B/3A/3B
Notification • AUP/UUP	Notification • AUP/UUP	Notification • AUP/UUP
Reference location • RSA • FBZ	Reference location • Point/s • Airspace	Reference location Everything except FBZ

[4] EU/EURO restriction publication is used as a last minute solution on D-1 or D-OPS. Later, these restrictions need to be transferred in accordance with the RAD publication process.

4.6 FUA Restrictions Group

4.6.1 Purpose

(1) FUA restrictions group is a combination of different types of TFR restrictions (i.e. FUA restrictions and FUA/RAD restrictions) with dependent applicability on the same RSA or multiple RSAs managed as a group and/or individually via AUP/UUP.

(2) The aim is to set a group of different restrictions associated to an RSA and managed them dynamically.

4.6.2 Creation

(1) FUA restrictions group are used for RSAs published in the AIP (i.e. AMA and NAM) and are only created by the CADF / AD Team on request of an AMC.

(2) The AMC shall pass the request for an FUA restrictions group to relevant State / FAB / ANSP National RAD Coordinator (NRC) for publication in the RAD Annex 2C.

(3) FUA restrictions are typically forbidden and the Forbidden Flow Routing is the same RSA used to define the Dependant applicability and used as Reference location. Military traffic is typically excluded, and Routes or DCTs across the RSA can also be excluded if required.

4.6.3 Publication

(1) Whenever a State decide to establish a restriction group, the ID will be published in the RAD Annex 2C, according to the provision described in ERNIP Part 1, Chapter 8.

(2) FUA restrictions group/s established for temporary areas is/are published by AIP Supplement, AIC, NOTAM and Annex for special events on the RAD homepage, available via B2B and published via the NOP portal.

4.6.4 Usage

(1) FUA restrictions group as all other RAD traffic flow rules are used by IFPS to validate/invalidate Flight Plans and by the Path Finder to generate valid routes. A basic FUA restriction will invalidate flight plans that have a profile calculated to be inside the airspace volume of the concerned area when it is activated in an AUP / UUP.

(2) The FUA restrictions group can contain or not a FUA restriction. This is relevant for FBZ. Indeed, due to the obligation to have at least a FUA restriction active when the FBZ is allocated, a FUA restrictions group (if it contains the FUA restriction) or a single FUA restriction (if not belonging to an active FUA restriction group) shall be activated.

FUA Restriction Group combinations		
FUA Restrictions	FUA Restrictions And FUA/RAD Restriction	FUA/RAD restrictions

4.6.5 Specificities in Restriction Types

Note: For identification of FUA restriction group refer to ERNIP Part 1, Chapter 8.

4.6.6 Implementation of FUA restrictions group in CACD and usage in CIAM

A Restriction Group can contain any combination of several types of Restrictions;

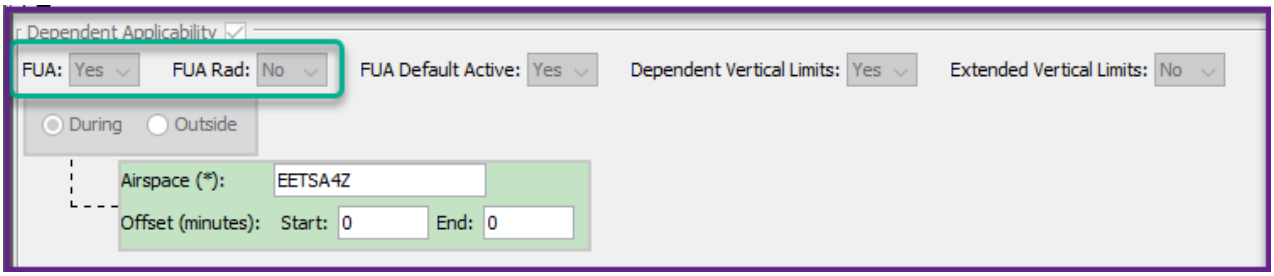
Category: FUA or FUA-RAD

- FUA can only group FUA restrictions
- FUA-RAD can group FUA restrictions and RAD traffic flow rules that have a dependant applicability referring the same RSA.

Note: Other potential future categories are:

- FRA: Restrictions that are part of a FRA definition
- RAD: Restrictions Units that can be grouped as they are part of a single RAD traffic flow rules.

A Restriction Grouping can be activated simultaneously in the AUP/UUP:



4.7 FPL Buffer Zone (FBZ)

4.7.1 Flight Planning Procedures around Active Reserved/Restricted Airspace

(1) The purpose of the following procedures is to enable a harmonised approach for IFR/GAT-iOAT flight planning around reserved/restricted airspace. These procedures will establish a more transparent process for the Flight plan acceptance by IFPS, both in fixed route and free route environments.

(2) The FPL Buffer Zone (FBZ) is the associated airspace, which may be applied to a reserved/restricted area defining the lateral and vertical limits for the purpose of submitting a valid IFR flight plan when such areas are active or planned to be active. Flight plans can be filed up to the boundary of the selected FBZ. The route described in flight plan route description, is to consider the nominal track between two points according to the great circle shortest route.

(3) For the submission of a valid flight plan (for an aircraft not engaged in an activity contained in the reserved/restricted airspace) the selected FBZ represent the totality of airspace to be avoided for flight planning purposes in accordance to the FUA/EU activated restriction.

(4) The State AIP, in addition to the publication of the reserved/restricted area, includes the associated "FBZ" when applicable. Multiple FBZs (e.g. different shape and/or location) can be published for the same restricted/reserved area.

(5) The activation of a selected FBZ is performed together with the associated restricted/reserved area. The time for the activation of the selected FBZ could differ from the activation time of the associated reserved/restricted area.

4.7.2 FPL Buffer Zone (FBZ) Types

(1) "Simple" FBZ is a single FBZ composed of only one airspace volume. Such FBZ in comparison to the area to which it is associated might have:

a) Different horizontal limits;

b) Same or different vertical limits.

(2) "Multiple" FBZ is a single FBZ composed of more than one airspace volume.

4.7.3 Publication

(1) Note: For identification of FBZ refer to ERNIP Part 1, Chapter 9.

4.7.4 FBZ Identification

(1) The identification of FBZ shall be composed of a group of letters and figures, added after the relevant area identification, as follows:

a) "Simple" FBZ:

- 1 (one) letter Z;

b) "Multiple" FBZ:

- 1 (one) letter Z; followed by
- 1 (one) number from 1 to 9.

(2) If, for any reason, a State needs to establish additional FBZs for an area with an already existing FBZ, then the provisions for "Multiple" FBZs are applied. In such cases the already existing FBZ will keep the existing identification. For example, the area EATSA20 has the associated FBZ identified as EATSA20Z. If the State decides to add two new FBZs, their identification will be in accordance with the "Multiple FBZ" provisions: EATSA20Z1 and EATSA20Z2.

FBZ associated to P, R and D area

(3) Each FBZ associated to prohibited area, restricted area, or danger area should be identified, by up to 9 (nine) characters, as:

- **EAR1AAAZ1** or **EAR1B1BZ** or **EAR1111Z**, etc.; or
- **EAR1AAAZ1** or **EAR1B1BZ1** or **EAR1111Z1**, etc.

Position	1	2	3	4	5	6	7	8	9
Character	E	A	P or R or D	1 - 9	-	-	-	-	Z
					A - Y or 0 - 9	-	-	-	
					A - Y or 0 - 9	A - Y or 0 - 9	-	-	
					A - Y or 0 - 9	A - Y or 0 - 9	A - Y or 0 - 9	-	
					A - Y or 0 - 9	A - Y or 0 - 9	A - Y or 0 - 9	A - Y or 0 - 9	
Explanation	Location indicator		Area ID letter	Area ID number	Area ID number or Area subparts indication				"Simple" FBZ

Position	1	2	3	4	5	6	7	8	9
Character	E	A	P or R or D	1 - 9	-	-	-	Z	1 - 9
					A - Y or 0 - 9	-	-		
					A - Y or 0 - 9	A - Y or 0 - 9	-		
					A - Y or 0 - 9	A - Y or 0 - 9	A - Y or 0 - 9		
Explanation	Location indicator		Area ID letter	Area ID number	Area ID number or Area subparts indication			"Multiple" FBZ	

Examples of identification structures of FBZ associated to P, R or D area

(4) If applicable, each FBZ associated to prohibited area, restricted area, or danger area should be named as EAR1AAAAZ1 TEST or EAR1111Z1 LEST. The name should be only in upper cases and should be separated by only one space from identification. As the name composition is free, it is not part of the 9 characters composing the identification.

FBZ associated to TSA, TRA and CBA

(5) Each FBZ associated to TSA or TRA or CBA should be identified, by up to 9 (nine) characters, as:

- **EATSA10AZ** or **EATR2D0EZ** or **EATAAA0AZ** or **EUCCCC0CZ**, etc.;
- **EATSA9WZ1** or **EATRR0RZ1** or **EATAA0AZ1** or **EUCCC0CZ1**, etc.

In order to comply with this requirement the relevant TSA, TRA or CBA shall be identified by up to:

a) 8 (eight) characters, when "Simple" FBZ is associated;

Position	1	2	3	4	5	6	7	8	9
Character	E	A	T C	S or R B	A	1 - 9	-	- or A - Y	Z
						A - Y or 1 - 9	0 - 9	- or A - Y	
Explanation	Location indicator		TSA or TRA or CBA			Area indication		Area subparts indication	"Simple" FBZ

Position	1	2	3	4	5	6	7	8	9
Character	E	A	T	S or R	1 - 9	-	-	- or A - Y	Z
					A - Y or 1 - 9	0 - 9	-	- or A - Y	
					A - Y or 1 - 9	A - Y or 0 - 9	0 - 9	- or A - Y	
Explanation	Location indicator		TS - TSA TR - TRA		Area indication			Area subparts indication	"Simple" FBZ

Position	1	2	3	4	5	6	7	8	9
Character	E	A U	T C	1 - 9	-	-	-	- or A - Y	Z
				A - Y or 1 - 9	0 - 9	-	-	- or A - Y	
				A - Y or 1 - 9	A - Y or 0 - 9	0 - 9	-	- or A - Y	
				A - Y or 1 - 9	A - Y or 0 - 9	A - Y or 0 - 9	0 - 9	- or A - Y	
Explanation	Location indicator		T - TSA T - TRA C - CBA	Area indication				Area subparts indication	"Simple" FBZ

b) 7 (seven) characters, when "Multiple" FBZ is associated.

Position	1	2	3	4	5	6	7	8	9
Character	E	A	T C	S or R B	A	1 - 9	- or A - Y	Z	1 - 9
Explanation	Location indicator		TSA or TRA or CBA			Area indication	Area subparts indication	"Multiple" FBZ	

Position	1	2	3	4	5	6	7	8	9
Character	E	A	T	S or R	1 - 9	-	- or A - Y	Z	1 - 9
					A - Y or 1 - 9	0 - 9	- or A - Y		
Explanation	Location indicator		TS - TSA TR - TRA		Area indication		Area subparts indication	"Multiple" FBZ	

Position	1	2	3	4	5	6	7	8	9
Character	E	A U	T C	1 - 9	-	-	- or A - Y	Z	1 - 9
				A - Y or 1 - 9	0 - 9	-	- or A - Y		
				A - Y or 1 - 9	A - Y or 0 - 9	0 - 9	- or A - Y		
Explanation	Location indicator		T - TSA T - TRA C - CBA	Area indication			Area subparts indication	"Multiple" FBZ	

Examples of identification structures of FBZ associated to TSA, TRA or CBA

4.7.5 Usage

(1) The allocated reserved/restricted area, the selected FBZ(s) and the associated FUA are notified to airspace users via EAUP/EUUP. The time and vertical dimensions of the selected FBZs could be different from those of the associated reserved/restricted area.

(2) AUP/UUP should be considered the primary means of notification of planned activation for reserved/restricted airspace. For non AMC manageable areas, States should consider their requirements for notification to airspace users also via AIS publications (e.g. NOTAM). In all cases, when FBZ is applicable, both reserved/restricted airspace and the FBZ should be notified, with identification, coordinates and time period of activation.

(3) When utilising the AUP/UUP, the required activation of FBZ, as described in AIP, will be properly notified via CIAM/ASM tools. Airspace users will be notified subsequently via EAUP/EUUP.

(4) When ad-hoc areas are established and the application of the horizontal/vertical FBZ is required, adequate publication (e.g. NOTAM or AIP Supplement) should be provided. The inclusion of the FBZ within the limits of the defined ad-hoc areas may be considered in order to simplify the publication. In case of partial vertical activation (level bands) of the reserved/restricted areas, the vertical FBZ should be considered within the vertical limits of the level bands required. Whereas one or more FBZs with different dimensions compared to the area are required, adequate publication is expected (e.g. NOTAM or AIP supplement).

(5) In case of modular areas, the combination of modules allocated should be notified via AUP/UUP, including the activation of FBZs, if required. IFPS will validate the flight plans against each module, including the associated FBZ, in order to detect whether the trajectory is passing through one or more of the modules, including the associated FBZs. In case of the trajectory is passing through a module and the overlapping FBZ of the adjacent module, IFPS will consider the interaction with both of them.

4.7.6 Flight Planning

(1) In relation to the flight planning processes, the following rules should be considered:

- When applicable, for each reserved / restricted area, one or more FBZs have been established for flight planning purposes. Flight plans can be filed up to the boundary of the FBZ when active.
- The route described in flight plan route description, shall consider the nominal track between two points according to the great circle shortest route.
- Reserved/restricted airspace and the FBZ are notified when active by… [insert appropriate promulgation means].

(2) These limits are used to check flight plan in a free route environment or DCT. For example, with an area activated from FL100 to FL230, all flight plans crossing the area between FL100 and FL230 inclusive will be rejected.

(3) Different is the case when a route (CDR1 or ATS) crossing the area is used for flight planning purposes. In this case, the above mentioned principles for the CDR1 publication are considered, "expanding" the area in order to match with the intermediate FLs. In general terms, the expansion is considered adding 5 or 10 (above FL410) at the upper limit and reducing 5 or 10 (above FL410) at the lower limit.

(4) Using the previous example, in case of activation of an area from FL100 to FL230, a CDR1 crossing an area will be available from FL235 and above and FL095 and below, therefore the first IFR FLs available will be FL240 and FL090. The intermediate FLs are relevant for the validation of climbing and descending flight profiles.

(5) In case of intermediate FLs used for the activation of the area (e.g. FL095 and FL235), the expansion is not required. If the allocation of the area is done via CIAM, it is possible to use the expansion function; in this case, the associated routes will be automatically processed according to the intermediate FLs. Acting directly on the opening or closure of CDR1s, intermediate FLs should be used, otherwise the system detects an error and blocks the allocation process.

4.7.7 Non-standard Planning Zone/s (NPZ) - see Chapter 3

4.8 FUA Process

(1) The FUA process is described in detail in ERNIP Part 3 - ASM Handbook. Hereafter, complementary information is provided for those elements more relevant for airspace users.

4.8.1 Airspace Use Plan/Updated Airspace Use Plan

4.8.1.1 Airspace Use Plan (AUP)

(1) The "Airspace Use Plan" (AUP) is the official medium for the daily notification by an AMC of the national airspace allocation for a reference day. An AMC shall release only ONE AUP per day.

(2) Changes to the AUP published at D-1 could be effected by the AMC through an "Updated Airspace Use Plan" (UUP) [see ERNIP Part 3, Annex 6].

(3) As AUPs are not sent individually to AOs, the information provided by AMCs on the airspace structures use plans in the ECAC area shall be disseminated by the NM/CADF via the NOP portal and via eAMI messages, to operators for awareness as well as for flight planning purposes.

4.8.1.1.1 Description of the AUP

(1) The elements included in the AUP are described below:

- Header

First Line	**Identification of the Type of Message** [e.g. Airspace Use Plan or Draft AUP]
Second Line	**Identification of the Sending Unit** [e.g. AMC: EDDAZAMC - GERMANY -]
Third Line	**Definition of the Validity Period of the Message** [e.g. 06/06/2008 06:00 - 07/06/2008 06:00] The validity period shall cover the 24 hour time period between 0600 UTC the next day to 0600 UTC the day after. This time period has to be considered for continuity purposes as a semi-open interval with the first limit included and the last one not.
Fourth Line	**Date and Time of Transmission of the AUP** [e.g. 05/06/2008 13:53] In addition to the type of message defined in the first line, the AUP is identified by the day and time of its transmission.

Table 48: AUP Header

- Lists ALPHA to FOXTROT

  For each allocated airspace structure listed in the AUP in the following sequence, the different columns will contain:

ALPHA	List of Permanent ATS Routes and CDR1s temporary unavailable for flight planning;	
BRAVO	List of Active areas, including NPZ, defined in NM system as AMC Manageable Area (AMA); List of active temporary AMC-manageable areas established via NOTAM/AIP Supplement/AIC, list of active FBZ areas linked to AMAs;	
CHARLIE	List of areas, including NPZs, defined in NM system as Non AMC-manageable areas (NAM); List of active temporary Non AMC Manageable areas established via NOTAM/AIP Supplement/AIC, list of active FBZ areas linked to NAMs;	
DELTA	List of SIDs and STARs temporary unavailable for flight planning due to areas activations as appropriate;	
ECHO	AUP/RAD Restrictions	
FOXTROT	Additional Information	
First Column	**Number** [e.g. 1] Each airspace structure shall be listed with a sequence number and shall contain only **one** "Validity Period" and **one** "Flight Level Block" per number element. For each list ALPHA to FOXTROT, the sequence number shall start with [1] for the first item of the list in alphanumeric order. Upper and lower ATS routes having the same generic name shall be placed one above the other. In order to meet requirements of various readers of the AUP, the different lists ALPHA to FOXTROT can be divided by FIR/UIR, but in keeping their unique sequence number of the alphanumeric order to allow their identification in the UUP in case of cancellation or reallocation.	
Second Column	**Designator** [e.g. UR 80 PERDU TBO or LF-D 31 CAZAUX or UF REIMS] Each airspace structure shall be identified as follows:	
	For Lists ALPHA	with the AIP ENR 3-2 route designator followed by the two ICAO identifiers of the first and last points of the portion of the CDR1/ATS route concerned.
	For Lists BRAVO and CHARLIE,	with the AIP ENR designator followed, if needed, by the name of the airspace or portion thereof concerned; With the ID of the temporary areas published by States via NOTAM/AIP Supplement/AIC. Designator of any FBZ or NPZ.
	For List DELTA,	with the AIP AD 2 airport designator + the designator used for SID/STAR.
	For List ECHO	AUP/RAD designator according to RAD document

	For List FOXTROT	Not Applicable (N/A)
Third Column	**Flight Level Block** [e.g. F110 - F240 or F250 - UNL or GND or SFC - 900M AGL] Each airspace structure shall be described vertically as follows:	
	For List ALPHA,	with the upper and lower limits of the ATS route and CDR1 or portion thereof unavailable inclusive of the IFR flight levels given;
	For Lists BRAVO and CHARLIE	with the upper and lower limits of the affected airspace expressed either in flight levels, altitudes or heights inclusive of the figures given.
	For list DELTA,	due to the different altitudes/FLS used in the descriptions of SID/STAR, "Not Applicable (N/A)" should be used.
	For list ECHO	Not Applicable (N/A)
	For list GOLF	Not Applicable (N/A)
	Note: due to the technology used by NM system, the EAUP published on the NOP portal will use intermediate FL.	
Fourth Column	**Validity Period** [e.g. 12:05 - 06:00] For each allocated airspace structure listed in ALPHA to GOLF, the "Validity Period" shall not exceed the 24 hours period of the AUP. The AUP shall repeat daily all data affecting more than one day. The "Validity Period" expressed with date/time groups indicating the start and the end of the period means variously:	
	For List ALPHA,	the "Period of unavailability for flight planning";
	For List BRAVO,	the "Period of Use";
	For List CHARLIE,	the "Period of Use";
	For List DELTA	the "Period of unavailability for flight planning";
	For List ECHO	the "Period of AUP/RAD Restriction applicability".
	For List FOXTROT	Not Applicable (N/A).
	This time period has to be considered for continuity purposes as a semi-open interval with the first limit included and the last one not. Date will be referred to the day only and time will be expressed in hours and minutes.	
Fifth Column	**Restrictions** This column will allow the AMC to indicate when an NM restriction is required according to the follow:	
	For List ALPHA,	Not Applicable (N/A)
	For List BRAVO and CHARLIE,	FUA Restriction/ FUA/RAD restrictions / FUA restrictions group/ Airspace Scenarios Restriction Group is required for a permanent area and/or temporary area;
	For List DELTA	Not Applicable (N/A)

	For List ECHO	Not Applicable (N/A)
	For List FOXTROT	Not Applicable (N/A)
	FUA Restriction/ FUA/RAD restrictions / FUA restrictions group / Airspace Scenario Restriction Group should be available in the CACD. Coordination with national responsible Authority is required for their definition.	
Sixth / Seventh Columns	**Responsible Unit and/or Remarks Field** [e.g. For continuation see AUP Germany EDFFFIR or ETNT BOMBING 3 /F4] For each allocated airspace structure listed in ALPHA to GOLF, the "Remarks Field" may be used to input any specific comments.	
	For List ALPHA,	when the ATS route closure information needs to be repeated in the EAUP for safety repetition, the word "NOTAM" shall be included without any reference;
	For List BRAVO,	the column dedicated to the responsible unit shall contain the indication "AMC" for those areas subject to negotiation. In case of airspace reservation made outside the AIP published times/vertical limits according to temporary modifications published via NOTAM, the NOTAM ID shall be specified in the Remarks column. The same information shall be repeated in the EAUP.
	For List CHARLIE	the unit responsible may be indicated for the concerned airspace during the time specified by the Validity Period; then the remarks field may be divided into two parts separated by a tab to indicate additional information, such as FUA restrictions/ FUA/RAD Restrictions/ FUA restrictions groups ID codes / Airspace Scenario Restriction Group ID codes, the type of activity and the number and type of aircraft concerned. In case of airspace reservation made outside the AIP published times/vertical limits according to temporary modifications published via NOTAM, the NOTAM ID shall be specified in the Remarks column. The same information shall be repeated in the EAUP.
	For List DELTA	Not Applicable (N/A)
	For List ECHO	the FMP unit responsible for the AUP/RAD Restriction management.
	For List FOXTROT	Not Applicable (N/A)

Table 49: List ALPHA to FOXTROT

- Additional Information

  Finally, any additional information may be added in plain language at the end of the message (LIST FOXTROT).

4.8.1.2 Updated Airspace Use Plan (UUP)

(1) After the AMC has completed the allocation process and published accordingly the modifications to the airspace allocation might be necessary in order to take advantage of the cancellation of any previously reserved airspace structure or to provide information of new allocation of areas. Changes to the airspace allocation will be promulgated by the AMC through an "Updated Airspace Use Plan" (UUP).

(2) The CDR1s new availability/unavailability described in UUPs, will be published via the EUUP on the NOP portal and the CACD database will be updated accordingly.

(3) UUPs shall consist of alterations to the current AUP. In particular, UUPs will contain details of:

- The cancellation of areas allocated in the current AUP;
- The cancellation/relaxation of FUA restrictions/ FUA/RAD Restriction / FUA restrictions group;
- The new allocation of RSAs;
- The new/more constraining activation of FUA restrictions/ FUA/RAD restriction / FUA restrictions group;
- New CDR1s unavailability due to new allocation of areas and/or new/more constraining activation of FUA restrictions/FUA restrictions group;
- Modifications made to CDR1s already listed in the current AUP;
- Alterations to, or cancellations of, unavailable ATS routes or CDRs1, RSAs and FUA restrictions/ FUA/RAD restriction / FUA restrictions group listed / Airspace Scenario Restriction Group listed in the current AUP;
- Extension or new relaxation of the AUP/RAD restrictions;
- Reduction of flight planning opportunities offered by the AUP/UUP restrictions previously published or cancellation of AUP/RAD relaxation.

4.8.1.2.1 General case with additional route or airspace availability

(1) Each UUP can contain the following information:

a) **Allowed**

- Cancellation of RSA allocation;
- Reduction (in time and/or FL) of RSA allocation;
- Cancellation of CDR1/ATS route unavailability;
- Reduction (in time and/or FL) of CDR1/ATS route unavailability;
- Reduction or cancellation of restrictions associated to RSA/s;
- Extension or new relaxation of the AUP/RAD restrictions.

There is one additional exception to the above limitations: in case the UUP concerns the correction of erroneous data published by mistake in the AUP, and this corrected data is available in due time for publication as part of one of the UUP06.

In such a case, the CADF may decide to publish an AIM to attract the attention of airspace users on the potential impact of the concerned UUP.

4.8.1.2.2 Specific UUPs with additional route or airspace closures

(1) Additional route unavailability or airspace allocation requested at D-1 for D-OPS can use the UPP 17.00 UTC (summer 16.00 UTC) up to 20.00 UTC (summer 19.00 UTC) every hour.

(2) The day of OPS, each UUP from 07.00 UTC (summer 06.00 UTC) until 20.00 UTC (summer 19.00) can include the following additional information:

- Additional RSA allocation;
- Extension (in time and/or FL) of RSA allocation;
- Cancellation of CDR 2 availability published in previous AUP/UUP;
- Additional CDR1/ATS route unavailability;
- Extension (in time and/or FL) of CDR1/ATS route unavailability;
- Additional/more restrictive FUA restriction/s / FUA restriction group;
- Reduction or cancellation of AUP/RAD restrictions;
- Extension or new AUP/RAD restrictions.

(3) For the choice of the convenient UUP, it should be considered the required lead time of Three Hours (3H) before its validity (i.e. procedure 3). In case the request does not respect the three hours (3H) lead time, NM should inform AMC that the reject the request to promulgate the draft UUP is rejected, unless specific contingency situation requires an exception (e.g. correction of previous erroneous publication).

(4) The additional activations of RSAs or additional/more restrictive restrictions or unavailability of CDRs/ATS routes requested at D-OPS can be part of these UUPs, if they comply with the 3-hour lead time. In case of the request does not respect the three hours (3H) lead time, NM (MILO) shall inform AMC that the request to promulgate the draft UUP is rejected, unless specific contingency situation requires an exception (e.g. correction of previous erroneous publication). Where required, relevant AAs, RSAs users, FMPs concerned and adjacent AMCs should acknowledge the reception of a Draft UUP.

(5) For all UUP's Day-1, this lead time is guaranteed by the UUP validity, starting only the next day at 06:00 UTC.

(6) The UUP represents a snapshot and contains full information on airspace allocation for the reference validity time. As consequence, an ATS route or CDR1 becoming available will disappear from List ALPHA and an ATS route or CDR1 becoming unavailable will appear in List ALPHA. The released RSAs will disappear from the Lists BRAVO and CHARLIE and the new RSAS allocation will appear in the Lists BRAVO and CHARLIE. The change of FUA/EU restrictions / FUA/RAD Restrictions / FUA restrictions group / Airspace Scenario Restriction Group will update the related column and the information in the remark field. The SIDs and STARs becoming available due to the release of the areas, they will disappear from list DELTA. The SIDs and STARs becoming unavailable will appear in List DELTA. The AUP/RAD restrictions will appear in list ECHO in case of new relaxation. The AUP/RAD restrictions will disappear from list ECHO in case of cancellation. Lastly, reduction of the flight plan opportunities offered by the AUP/RAD restrictions previously published.

Note: The function "Compare" of the CIAM application will visualise the differences from the previous AUP/UUPs.

4.8.1.2.3 Preparation, Publication and Distribution of the UUP

(1) The UUP shall be prepared by the AMC in the same common format as the AUP and distributed to the NM.

(2) The UUPs information will be used by NM/CADF to produce eAMI messages as well as available on the NOP portal.

4.8.1.2.4 Description of the UUP

(1) The UUP shall contain lists in the same sequence as for the AUP and for easy reference, the number element of each amended route/airspace in the UUP shall be the same number as the item in the corresponding AUP it is amending.

(2) The elements included in the UUP are described below:

- Header

First Line	**Identification of the Type of Message** [e.g. Updated Airspace Use Plan]
Second Line	**Identification of the Sending Unit** [e.g. AMC: EDDAZAMC - GERMANY]
Third Line	**Definition of the Validity Period of the UUP** [e.g. 08/06/2008 12:00 - 09/06/2008 06:00] The validity period of an UUP shall not exceed the validity period of the AUP it is amending and shall end at the same time. As for the AUP, this validity period has to be considered for continuity purposes as a semi-open interval with the first limit included and the last one not.
Fourth Line	**Date and Time of Transmission and "With Effective From (WEF)" Time of the UUP** [e.g. 08/06/2008 08:53 10.30]

Table 50: UUP Header

In addition to the type of message defined in the first line, it is important to identify the day and time of transmission and the WEF Time. The WEF Time is the time when the UUP will be published. The time sequence is: 1) Time of Transmission; 2) WEF Time, and 3) the start of the Validity Period of the UUP.

Note: An AMC could prepare multiple draft UUPs with different WEF Time.

- Lists ALPHA to FOXTROT

The UUP shall contain lists in the same following sequence as for the AUP:

ALPHA	Amended List of Permanent ATS routes and CDR1s temporary unavailable for flight planning;
BRAVO	Amended List of Active areas defined in CACD as AMC Manageable (AMAs). Amended List of temporary AMC-manageable areas established via NOTAM/AIP Supplement/AIC, active FBZ areas linked to AMAs; active NPZs classified as AMA.
CHARLIE	Amended List of Active Non AMC-Manageable areas (NAM's); Active temporary Non AMC-manageable areas established via NOTAM/AIP Supplement/AIC, active FBZ areas linked to NAMs; active NPZs classified as NAM.
DELTA	Amended List of Unavailable SIDs and STARs, as appropriate.
ECHO	Amended List of AUP/RAD Restrictions.
FOXTROT	Additional information.

Table 51: List ALPHA to GOLF

For each amended airspace structure listed in the UUP, the different columns will contain:

First Column	**Number** [e.g. 3] For ease of reference, the number element of each amended route/airspace in the UUP shall be the same number as the item in the corresponding AUP it is amending. For the new airspace structures made available, a sequence number following the last number element of the corresponding list in the AUP shall be used so as to avoid any confusion. Where two or more airspace structures in the AUP are being replaced by one in the UUP, the second and following airspace structures must also appear in the UUP, but with only the word "deleted" in the Remarks field. In order to meet requirements of various readers of the UUP, the different lists ALPHA to FOXTROT can be divided by FIR/UIR, but in keeping their unique sequence number of the alphanumeric order in the original AUP.	
Second Column	**Designator** [e.g. UR 80 PERDU TBO or LF-TSA 42 or UF REIMS] Each amended airspace structure shall be identified as follows:	
	For Lists ALPHA,	the AIP ENR 3-2 route designator followed by the two ICAO identifiers of the first and last points of the portion of the CDR1/ATS route concerned.
	For Lists BRAVO and CHARLIE,	with the AIP ENR designator followed, if needed, by the name of the airspace or portion thereof concerned; With the ID of the temporary areas published by States via NOTAM/AIP Supplement/AIC; Designator of any FBZ or NPZ
	For List DELTA,	With the AIP AD 2 airport designator + the designator used for SID/STAR

	For List ECHO	AUP/RAD Restrictions according to RAD document
	For List FOXTROT	Not Applicable (N/A)
Third Column	**Flight Level Block** [e.g. F110 - F240 or F250 - UNL or GND or SFC - 900M AGL] Each amended airspace structure shall be described vertically as follows:	
	For List ALPHA,	with the upper and lower limits of the ATS route and CDR1 or portion thereof unavailable inclusive of the IFR flight levels given;
	For Lists BRAVO and CHARLIE,	with the upper and lower limits of the affected airspace expressed either in flight levels, altitudes or heights;
	For List DELTA,	Due to the different altitudes/FLs used in the descriptions of SID/STAR, "Not Applicable (N/A)" should be used.
	For List ECHO	Not Applicable (N/A)
	For List GOLF	Not Applicable (N/A)
	Note: Due to the technology used by NM system, the EAUP publish on the NOP portal will use intermediate FL.	
Fourth Column	**Validity Period** [e.g. 12:05 - 06:00] For each amended airspace structure listed in ALPHA to GOLF, the "Validity Period" shall not exceed the validity period of the UUP. The "Validity Period" expressed with date/time groups indicating the start and the end of the period means variously:	
	For List ALPHA,	the "Period of unavailability for flight planning";
	For List BRAVO,	the "Period of Use";
	For List CHARLIE,	the "Period of Use";
	For List DELTA,	the "Period of Use";
	For List ECHO,	Updated "Period of AUP/RAD Restrictions applicability";
	For List FOXTROT,	Not Applicable (N/A)
	This time period has to be considered for continuity purposes as a semi-opened interval with the first limit included and the last one not. Date will be referred to the day only and time will be expressed in hours and minutes.	
Fifth Column	**Restrictions** This column will allow the AMC to indicate when an NM restriction is required according to the follow:	
	For List ALPHA	Not Applicable (N/A)
	For List BRAVO and CHARLIE	FUA Restriction/ FUA/RAD restriction / FUA restrictions group / Airspace Scenario Restriction Group is required for a permanent area and/or temporary area. FUA Restriction/ FUA/RAD restriction / FUA restrictions group should be available in the CACD. Coordination

		with national responsible Authority is required for their definition.
	For List DELTA	Not Applicable (N/A)
	For List ECHO	Not Applicable (N/A)
	For List FOXTROT	Not Applicable (N/A)
Sixth / Seventh Columns	**Responsible Unit and/or Remarks Field** [e.g. Deleted or ETNT BOMBING 3 /F4] For each amended airspace structure listed in ALPHA to ECHO, the Remarks field may be used to input any specific comments.	
	For Lists ALPHA	when continuation of the ATS route has been coordinated with (a) neighboring State(s) in (an) adjacent FIR/UIR(s), [*the following information shall be given "For continuation see AUP + country name + FIR designator"*] or [*the information on the consolidated CDR1 portion commonly accessible shall be given only once in the AUP of the designated Lead AMC*];
	For List BRAVO	the column dedicated to the responsible unit shall contain the indication "AMC" for those areas subject to negotiation; In case of airspace reservation made outside the AIP published times/vertical limits according to temporary modifications published via NOTAM, the NOTAM ID shall be specified in the Remarks column. The same information shall be repeated in the EUUP.
	For List CHARLIE	the unit responsible may be indicated for the concerned airspace during the time specified by the Validity Period; then the remarks field may be divided into two parts separated by a tab to indicate additional information, such as FUA restrictions/ FUA/RAD Restrictions/ FUA restrictions group ID codes, the type of activity and the number and type of aircraft concerned. In case of airspace reservation made outside the AIP published times/vertical limits according to temporary modifications published via NOTAM, the NOTAM ID shall be specified in the Remarks column. The same information shall be repeated in the EUUP.
	For List DELTA	Not Applicable (N/A)

	For List ECHO	the FMP unit responsible for the AUP/RAD Restriction management
	For List FOXTROT	Not Applicable (N/A)

Table 52: UUP Airspace Structure

- Additional Information
  Finally, any additional information may be added in plain language at the end of the message (List FOXTROT)

4.8.2 Preparation, Publication and Distribution of the AUP/UUP

(1) The AUP shall be prepared by the AMC and distributed to the NM via CIAM or via authorised ASM tools using B2B service.

(2) During the pre-AUP coordination procedure, draft AUPs will be used and identified as “Draft AUP”. Draft AUPs will be available to each AMC. At any time, there will be only ONE stored AUP per day and per AMC in “Airspace Use Plan” or "Draft" form identified in the first line of the header as "Draft AUP" or "Airspace Use Plan" respectively. The D-1 “Airspace Use Plan” content will be decided by the AMC itself at D-1 1400 UTC at the very latest or if none, automatically by the NM system, unless the AMC informed the NM of a late release of the AUP.

(3) The NM collects and consolidates the D-1 AUP, publishes the EAUP on the NOP portal and produces eAMI messages for the B2B service.

(4) Each AMC must produce a READY AUP for each day, even when no openings or closures have to be done. In the latter case, a NIL AUP shall be made.

This implies that for an AMC not manned during weekend or bank holidays or longer holiday periods, the READY AUPs for those days shall be made at least on the last day before the AMC closes down its operations for the period.

(5) The DRAFT AUPs available from D-6 to D-2 are published on the NOP Portal[5]. Due to the fact that they are not mandatory, no EAUP is expected.

[5] *Technical capability is not yet available.*

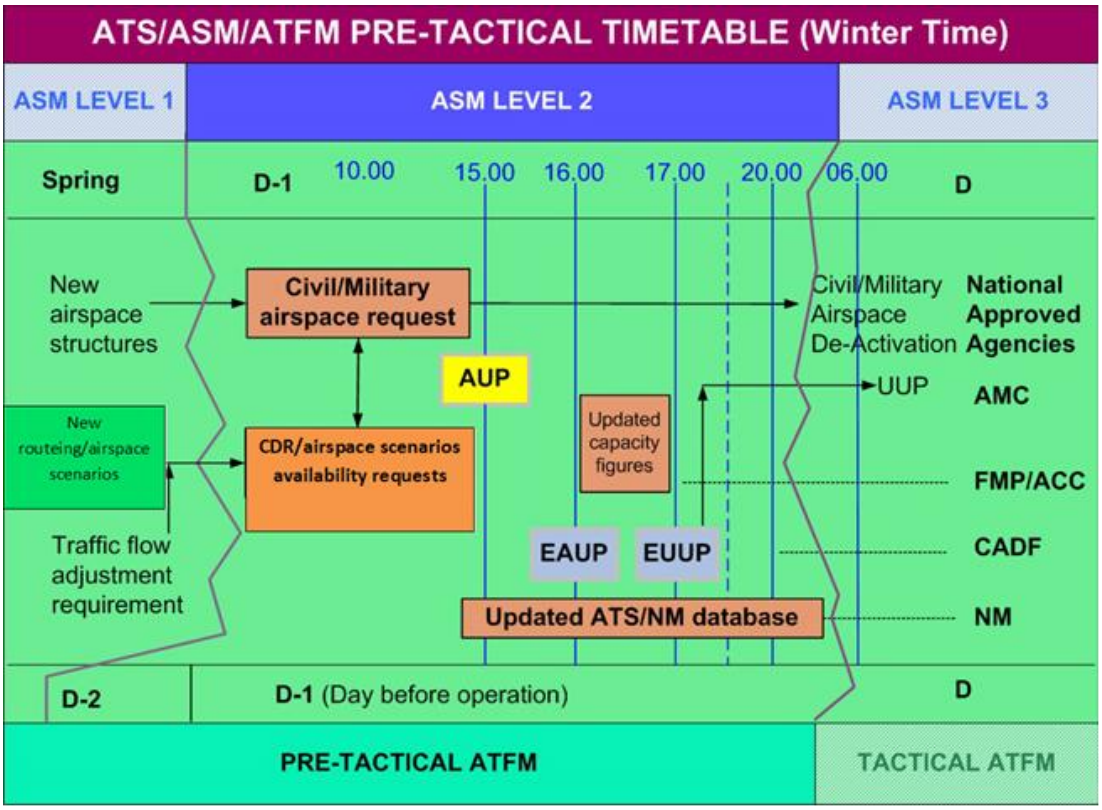


Figure 30: Example of ATS / ASM / ATFM pre-tactical timetable

4.8.2.2 Timing

(1) Technically, CIAM allows the publication of a UUP for a validity starting at any time between 06:00 UTC and 06:00 UTC the next day. The 'Next UUP time' is set by CADF.

(2) The UUPs shall be prepared by means of the CIAM software set up in NM terminals.

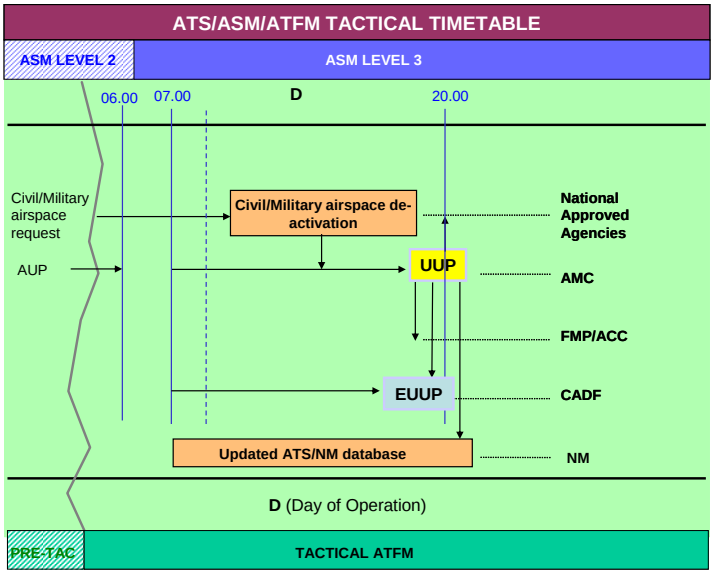


Figure 31: Example of ATS / ASM / ATFM tactical timetable

It is planned to have up to 31 UUPs (4 on D-1 + 27 on D) at fixed times as follows:

AUP/UUP	Ready before	Released before	Valid from	Valid until
AUP	D-1 15:00	D-1 16:00	D 06:00	D+1 06:00
UUP06/17	D-1 16:50	D-1 17:00	D 06:00	D+1 06:00
UUP06/18	D-1 17:50	D-1 18:00		
UUP06/19	D-1 18:50	D-1 19:00		
UUP06/20	D-1 19:50	D-1 20:00		
UUP07	D 06:50	D 07:00	D 07:00	D+1 06:00
UUP07:30	D 07:20	D 07:30	D 07:30	D+1 06:00
UUP08	D 07:50	D 08:00	D 08:00	D+1 06:00
UUP08:30	D 08:20	D 08:30	D 08:30	D+1 06:00
UUPhh	*D hh - 10'*	*D hh:00*	*D hh:00*	*D+1 06:00*
UUPhh:30	D hh + 20'	D hh:30	D hh:30	D+1 06:00
UUP20	D 19:50	D 20:00	D 20:00	D+1 06:00

Table 53: Example of ATS / ASM / ATFM pre-tactical WINTER timetable

AUP /UUP	Ready before	Released before	Valid from	Valid until
AUP	D-1 14:00	D-1 15:00	D 06:00	D+1 06:00
UUP06/16	D-1 15:50	D-1 16:00	D 06:00	D+1 06:00
UUP06/17	D-1 16:50	D-1 17:00		
UUP06/18	D-1 17:50	D-1 18:00		
UUP06/19	D-1 18:50	D-1 19:00		
UUP06	D 05:50	D 06:00		
UUP06:30	D 06:20	D 06:30	D 06:30	D+1 06:00
UUP07	D 06:50	D 07:00	D 07:00	D+1 06:00
UUP07:30	D 07:20	D 07:30	D 07:30	D+1 06:00
UUPhh	*D hh - 10'*	*D hh:00*	*D hh:00*	*D+1 06:00*
UUPhh:30	D hh + 20'	D hh:30	D hh:30	D+1 06:00
UUP19	D 18:50	D 19:00	D 19:00	D+1 06:00

Table 54: Example of ATS / ASM / ATFM pre-tactical SUMMER timetable

(3) After each publication of the EAUP or EUUP, the start time of the next UUP has to be set manually in CIAM by the CADF.

(4) In accordance with the changes introduced by Simultaneous UUP's, an AMC can already start the creation of a draft UUP for a given start time at any time before the time indicated in the 'ready before' column corresponding to that given start time.

Example: Draft UUP08 (valid from 08:00 UTC) can be created at any time before 07:50 UTC, so no need to wait for the publication time of the previous EUUP (Release UUP 07:30UTC).

(5) If the CADF has not set a 'next UUP time', the AMCs are not able to create any UUP and will get an error message.

(6) Considering UUP publication is not mandatory, CADF will not systematically set the 'Next UUP time' for all possible UUP times. Therefore when intending to create an UUP, an AMC should first check the next UUP time in CIAM. If no 'next UUP time' is set, the AMC should contact the CADF and ask them to set the next UUP time as required, according to the tables above.

(7) Coordination procedures must exist or be established between neighbouring AMCs (lead AMC concept, Cross Border Area concept).

(8) CIAM accepts consecutive UUPs with the same start time.

(9) The draft AUP will also be used to support coordination with the NM as required.

(10) Once the coordination between neighbouring AMCs as well as the NM is finalised, the AMC will promote the AUP before 15:00 UTC (14:00 UTC summer) from DRAFT to READY.

4.8.2.3 AUP/UUP warnings

(1) The aim of these warnings is to ensure correct information is propagated for the final publication of EAUP/EUUP

a) **No NOTAM closure**

- There is no NOTAM closure corresponding to the AUP/UUP closure (Route ID: Route portion);
- This warning indicates that NO NOTAM closure was manually input in CACD. NOTAM could have been overlooked by CADF staff or no NOTAM was published. The CDR1/ATS route closure will be applied to the NM systems according to the AUP/UUP data;
- Actions:
  - CACD: No action;
  - AMC: Depending on internal ANSP/State agreement, NOTAM publication or no NOTAM publication, the AMC is to coordinate with responsible services for the publication of a NOTAM. The AMC is to decide the way of closing routes they prefer: NOTAM or AUP closures or combination of both.

b) **AUP/UUP closure**

- (Route ID: Route portion) is only partially covered by NOTAM closure(s);
- This warning indicates that a NOTAM was implemented by CADF staff, but the closing time via AUP/UUP of the mentioned route(s) in

the NOTAM is longer then published on the NOTAM. The CDR1/ATS route closure will be applied to the NM systems according to the AUP/UUP data;

- Actions:
  - CACD: No action;
  - AMC: Depending on internal ANSP/State agreement, NOTAM update publication, the AMC is to coordinate with responsible services for the publication of a NOTAM or UUP to adapt according NOTAM publication.

```
------------------------|          AUP/UUP
01:00        19:00
------------------------|          NOTAM
01:00        18:00
```

c) **NOTAM closure**

- (Route ID: Route portion)"is only partially covered by AUP/UUP closure(s);
- This warning indicates that a NOTAM was implemented by CADF staff, but the closing time via AUP/UUP of the mentioned routes in the NOTAM is shorter then published on the NOTAM. The CDR1/ATS route closure will be applied to the NM systems according to the AUP/UUP data;
- Actions:
  - CACD: No action;
  - AMC: Depending on internal ANSP/State agreement, NOTAM update publication, the AMC is to coordinate with responsible services for the publication of a NOTAM or UUP to adapt according NOTAM publication.

```
|-------------------------          AUP/UUP
01:00                17:00
|-------------------------          NOTAM
01:00                18:00
```

d) **Warnings II and III**

- A combination of these warnings will indicate a warning as well;
- A NOTAM was implemented by CADF staff. The CDR1/ATS route closure will be applied to the NM systems according to the AUP/UUP data.
- Actions:
  - CACD: No action;
  - AMC: Depending on internal ANSP/State agreement, NOTAM update publication, the AMC is to coordinate with responsible services for the publication of a NOTAM or UUP to adapt according NOTAM publication.

```
|------------------------|          AUP/UUP
04:00        19:00
|------------------------|          NOTAM
01:00        18:00
```

e) **Other**

- RSA allocation (RSA ID) is less then 3 hours after planned UUP publication;
- CDR1/ATS route closure (Route ID: Route portion) is less than 3 hours after planned UUP publication;
- Warning: the above 2 messages indicate that the agreed 3 hour lead time for the procedure 3 application is not respected in an UUP;
- Actions:
  - CACD: Report to Airspace Data Domain;
  - AMC: Report to CADF staff reason (typing error, safety issue, etc.).
    Remark: CADF staff still monitors CDR1/ATS route closures and implement the route closures manually in the CACD, based on the published NOTAMs and before AUP/UUP validation in CIAM.

(2) The AUP/UUP procedure should be used for those areas classified as manageable; otherwise NOTAM publication should be followed. The publication of a NOTAM and usage of UUP is always required for the procedure 3 process.

4.8.3 Airspace reservation outside the published times/vertical limits

(1) NM Systems allows airspace reservations outside the AIP published times/vertical limits according to temporary modifications published via NOTAM. CACD staff is not responsible for checking existence as well as content of the NOTAM (AMC responsibility).

(2) A NOTAM notified airspace reservation outside the published times/vertical limits, the NOTAM number shall be described in the Remark column of the AUP/UUP.

(3) The reservation outside the published times/vertical limit will apply to the following:

- FUA Restrictions will apply to the modified limits.
- Automatic Route CDR expansion will apply to the modified limits.

(4) Temporary expansion of RSA limits will not modify the limits of the permanent RSA in NM System for download.

(5) Extended limits and the NOTAM reference will be published in the EAUP/EUUP on the NOP portal and processed via B2B.

(6) The flight plans will be validated according to the temporary extension of the RSAs as published in EAUP/EUUP.

4.8.4 Early Access to Weekend (EAW)

(1) Each ECAC State wishing to participate in the international agreement set-up to facilitate the EAW process across Europe notifies its decision to NM by a request at existing working arrangements in place.

(2) The decision may be supported by a written request and, if deemed necessary by the state, an appropriate AIS publication (e.g. AIP Supplement). This notification will clarify the selected Busy Friday during the summer season and CDRs, if not all, for which early access from 10:00 UTC is granted. The

notification could also include additional busy days and related CDRs, if not all, for which early access from 10:00 UTC is granted.

(3) Consolidated information of Busy Fridays and selected CDRs, if not all, will be provided on the NOP Portal (Strategic web page) at least one AIRAC cycle before summer season. Daily Information on airspace and/or CDR status is notified via AUP/UUP, and it will cover the extended availability agreed within the frame of the EAW arrangements.

(4) For FRA areas the flight plan process will consider the ASM Manageable Areas (AMA) which are concerned by Early Access arrangements. For other AMA not covered by these arrangements the planned routes will take into account the avoidance procedures in place.

4.8.5 Extended and Public Holiday

(1) When military operations are foreseen to be significantly reduced e.g. during a long holiday period, States should publish relevant airspace and route availability information via AUP/UUP.

(2) In addition to that, or in case AUP/UUP is not used, states, at their discretion, may publish relevant information in their AIP or through appropriate AIS publications (e.g. NOTAM below). In case of NOTAM, a pre-notification period of 7 days is required.

Filing time: 01/12/08 10:51
Origin time: 011045
Destination:
AFTN Originator:
Message text:
(A____/01 NOTAMN
Q)
A)???? B) 0112211500 C) 0201020600
E) THE CDR1 ROUTES LISTED HEREAFTER ~~ARE CONSIDERED CDR1 AND~~ WILL BE PERMANENTLY AVAILABLE FOR FLIGHT PLANNING DURING THE ABOVE MENTIONED PERIOD.)

UG109	KOK/DIK/KHR	195/460
UJ158	BAM/LNO	250/460

Figure 32: Example of NOTAM

(3) Public holiday list for which the States re-categories their CDRs is annually published in the ASM Booklet.

(4) Public holiday list for which the States re-categories their CDRs is annually published in the ASM Booklet.

4.9 Notification Process

(1) This chapter focuses on those elements of the FUA process aiming to disseminate airspace structures information to airspace users.

4.9.1 European AUP/European UUP

(1) The Network Manager collects the national AUP/UUPs and produces the European Airspace Use Plan (EAUP) and European Updated Airspace Use Plan (EUUP). The EAUP/EUUPs are the common harmonised format to share on

network level the planned and consolidated information with regard to airspace allocation. The EAUP/EUUP are daily published on the NOP Portal and used via B2B service to provide information to Aircraft Operators (AOs) for flight planning purposes.

(2) The content of the EAUP/EUUP is divided in three tabs:

- ATS Route and CDR Type 1 Closure
- RSA Allocations
- AUP RAD Activations

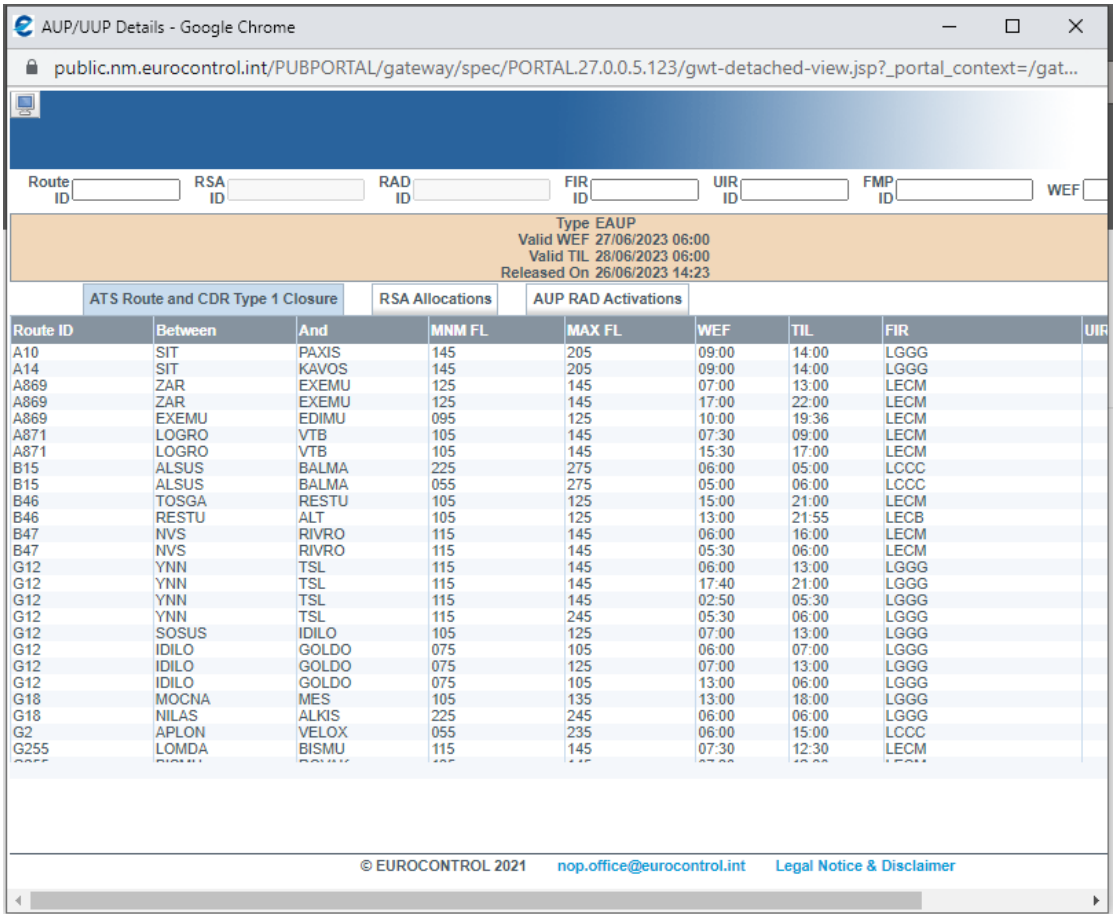


Figure 33: Example of EAUP

(3) "ATS Route and CDR Type 1 Closure" tab contains the route ID and the closed segments for the respective ATS Route and CDR1 for a given flight level band and period. AOs would not be able to flight plan along those routes indicated in this tab.

(4) "RSA Allocation" tab contains the ID of the RSA that have been allocated for a given flight level band and period. There is a column "CAT" which indicates if the RSA is AMC Manageable (AMA) or Non-AMC Manageable (NAM). For those RSAs that have a FUA/EU/EURO restriction activated, those are also published in a dedicated column "FUA/EU RS".

4.9.2 EAUP/EUUP Publication

(1) The CDRs unavailability and/or new/more constraining areas activations, FBZs and/or FUA/EU restrictions information relevant for flight planning should be disseminated by NM through:

- the NOP portal; and
- eAMI.

(2) Dissemination of information via eAMI should be done through the posting of CDR availability or airspace status and/or new/more constraining FBZs and/or FUA/EU restrictions updates onto FTP server in the same way as is being done by NM for e-RAD promulgation. Such a process would allow AO stakeholders using B2B service to upload the updates.

(3) The EAUPs/EUUPs update automatically the CACD database, therefore its information are used by IFPS for flight plan validation purposes. AUPs/UUPs are not planned to replace, unless a State decision, AIS notifications (e.g. AIP supplements, NOTAMs) that remains a national responsibility according to ICAO provisions. Nevertheless, focusing on the flight planning process, States should provide coherent information to the airspace users whenever both notification means are used. In this respect, airspace users should consider AUP/UUP information as the reference source for filing flight plans.

(4) EAUP/EUUP should be considered the main source, for flight planning purposes, to notify airspace users about the status of airspace structures managed via AUP/UUP as described in ERNIP Part 3, Annex 5 and 6. The EAUPs/EUUPs update automatically the CACD database, therefore its information is used by IFPS for flight plan validation purposes. EAUPs/EUUPs are not planned to replace, unless a State decision, AIS notifications (e.g. AIP supplements, NOTAMs) that remains a national responsibility. Nevertheless, focusing on the flight planning process, States should provide coherent information to the airspace users whenever both notification means are used. In this respect, airspace users should consider EAUP/EUUP information as the reference source for filing flight plans. States should ensure that AIS notification constantly reflects the EAUP/EUUP information. In case of the information is published before via AIS notification, the most appropriate EAUP/EUUP should be used accordingly in order to ensure consistency in the NM CACD database for flight planning purposes. With specific regards to the notification of reserved/restricted areas activation, EAUPs/EUUPs provide information on associated restrictions (FUA/EU restrictions) relevant for flight planning purposes.

4.9.3 ASM Booklet – Conditional Routes (CDRs) Catalogue

(1) The ASM Booklet contains information on conditional routes as collected from national AIPs and it is updated every AIRAC cycle. The ASM Booklet is for information purposes only.

(2) This booklet provides some more information that cannot be displayed on the ERC/ERN charts such as time and level restrictions for Conditional Routes (CDRs). It also contains a list of national holidays relevant for the CDR classification per State.

(3) The ASM Booklet is published on the external EUROCONTROL website prior to each AIRAC cycle. Upon request the data contained in the ASM Booklet can be made available in .xls format.

4.10 Single CDR Category Environment

(1) As from 31 December 2022, Single CDR Category (SCC) environment, namely use of CDR1 only, has been implemented in IFPZ. The aim is to clearly distinguish what is available and what is not available for flight planning and promulgated through AUP/UUP.

4.11 Contingency

4.11.1 Contingency procedure

Note: For the complete CADF contingency procedure refer to ERNIP Part 3 – ASM Handbook – Annex 10.

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5 NM system - Flight Planning

5.1 Purpose

(1) The purpose of this Chapter is to describe the expression of the main rules and procedures in flight plans and associated messages processing by NM systems.

(2) It summarizes already known and explained NM features of the IFPS with the aim to present them to the Operational Stakeholders for proper understanding of the NM flight plans processing.

(3) It also describes some of the IFPS capabilities with regard to the way of processing flight plans in FRA.

(4) More details on flight plans processing by IFPS is available in the IFPS User's Manual.

(5) In this section of the document, although the terminology refers to ICAO FPL2012 format, it also includes all other formats (ADEXP/FIXM), and the equivalences shall be considered accordingly. Additional information on FF-ICE flight plans and iOAT flight plans processing is presented in Chapters 5.6 and 5.7.

(6) The requirements for submission of the flight plans and associated messages to IFPS are applicable for:

- Flights that operate inside IFPZ as IFR/GAT wholly or partly (mixed IFR/VFR or entering/leaving the IFPZ)
- Flights that operate within the iOAT airspace as IFR/iOAT wholly or partially (mixed GAT/iOAT)

Where IFR/GAT-iOAT is mentioned in this document, it refers to those flights that operate under these requirements.

5.2 Integrated Initial Flight Plan processing system (IFPS)

5.2.1 General Description

5.2.2 A centralised flight plan processing and distribution service has been established by EUROCONTROL and operates under the authority of the Network Manager (NM). The service is provided by the Integrated Initial Flight Plan Processing System (IFPS) and covers that part of the ICAO EUR Region known as the IFPS Zone (IFPZ). For complete list of counties see IFPS Users manual.

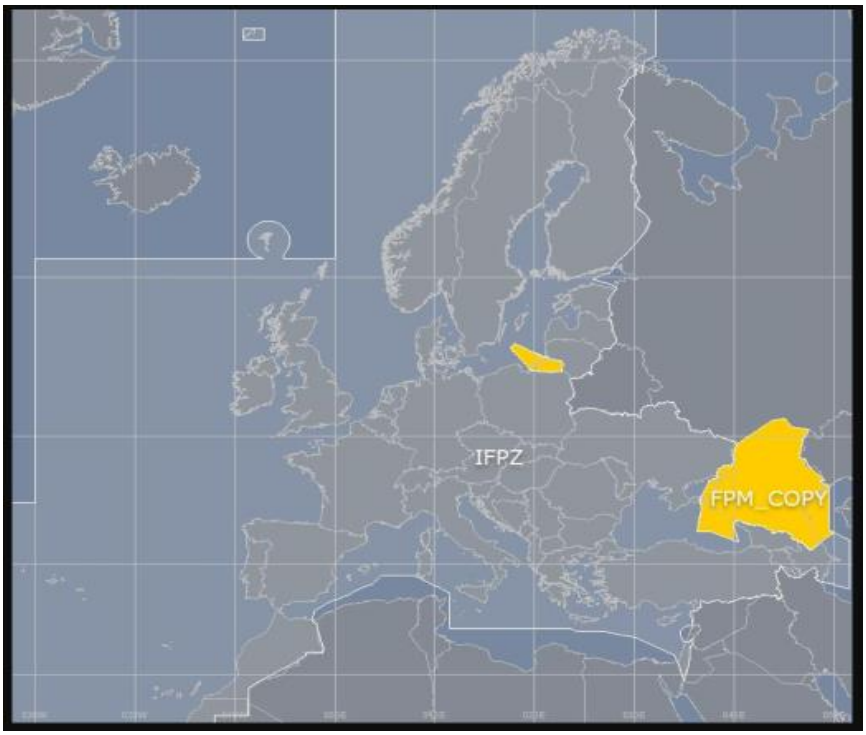


Figure 34 : IFPS Zone

(1) The IFPS checks the flight plans and subsequent associated messages, which it receives and corrects them in accordance with the CACD. The validation of flight plans and associated messages takes place automatically but may also require manual input. During the process of checking and correction, the IFPS extracts the data from the message, including the route description.

(2) After the completion of checking, correction and extraction process, the IFPS disseminates the accepted flight plans to the appropriate ATS units and the NM systems for the IFR/GAT-iOAT flights. By using the calculated flight profile IFPS automatically determines the required addresses for the messages within the IFPZ.

(3) For flight plans which include a portion outside the IFPZ (or iOAT airspace) or which are not IFR/GAT-iOAT, the IFPS does not perform the addressing or dissemination for that portion. In this case, the message originator is required to use the IFPS re-addressing function which provides a mechanism to ensure consistency between the flight plan distribution inside the IFPS Zone and the flight plans distributed outside the IFPS Zone. Alternatively, AOs can address the corresponding parts of the flight plan message directly to the ATC units involved.

5.2.3 IFPS processing features

(1) One of the aims of the IFPS is to reduce the number of sources of flight plan data within the IFPZ (or iOAT airspace) to a single point, thus maximizing the consistency of flight data available operationally. To achieve this, all IFR/GAT-iOAT flight plans and associated messages intending to operate within the IFPZ (or iOAT airspace) are submitted to the IFPS for processing. In addition, IFPS provides ATC units with flight plan data that can be automatically processed. In addition, IFPS feed the Enhanced Tactical Flow Management System with a copy of the flight plan data.

(2) IFPS calculates a 4 dimensional (4D) flight profile based on the Estimated Off-Block Time (EOBT), aircraft type, filed route and requested level. In the presence of constraints such as Profile Tuning Restrictions (PTR), the profile may be optimised against multiple weighted parameters. The tuning of parameters is performed in close co-operation between NMOC and the NM technical division. In eFPLs and FPLs submitted with trajectory data, the trajectory is also evaluated against the weighted parameters, and trajectory data that falls outside the parameters is dropped. This profile is used to generate the address list for distribution of the flight plan to ATC Units within the IFPZ/FPM distribution area. Any General Air Traffic / Instrument Flight Rules flight operating within the area where NMOC is responsible for FPM distribution needs to be filed to IFPS. If an Operational Air Traffic (OAT) portion is received as part of the flight plan, IFPS does not calculate any addresses for that portion of the flight, unless it is an iOAT portion (see chapter 5.7).

(3) Flight plans must be submitted to the IFPS for processing at least 3 (three) hours before the EOBT where possible to, if required, allow a timely CTOT distribution.

The IFPS also accepts for processing those messages that are, for operational reasons, filed less than three hours before the EOBT of that flight. Flight plans may be submitted up to a maximum of 120 hours (5 days) in advance of the EOBT of that flight plan. The flight plans that are submitted more than 24 hours in advance of the flight must include the Date Of Flight (DOF). This requirement is not relevant in the eFPLs related cases since the date of flight is always present with the EOBT (represented as a combined date/time) where the EOBT is mandatory. Any changes of more than 15 minutes to the EOBT of a filed flight plan must be submitted to the IFPS. If the modification relates to the introduction of the earlier EOBT of a flight, that flight must be cancelled and new flight plan should be submitted.

(4) The IFPS shall also send a copy of each processed message to the ETFMS in order that any relevant flow management restrictions may be applied to that flight as appropriate. The time parameter specified by the ETFMS for distribution of messages by the IFPS is set at 48 hours in advance of EOBT.

(5) When a flight plan is sent to the IFPS, it will perform following actions:

a) **Checking, Correction (if needed) and Extraction**

- Most flight plans are sent to the IFPS in ICAO FPL2012 format (but also in ADEXP, via XML NM B2B or FIXM FF-ICE).
- In IFPS the flight plans are converted to an ADEXP format.
- The IFPS checks the messages that it receives and corrects them as far as possible within its knowledge of the ATS environment. Correction of messages is done automatically as far as possible, but may also require manual input in some cases. During the process of checking and correction, the IFPS extracts the data in the message, including the route description/trajectory, and calculates 4D flight profile.
- The IFPS checks that only one flight with the same aircraft identification is operating at the time. It checks for duplicates and overlapping times for aircraft with the same aircraft identification and same aircraft registration. IFPS discards duplicate (exact character match) flight plans from the same originator (within a specific time parameter) with no further processing or outputs.

Matching with other flight plans are dependent on ARCID, EOBT, airport of departure and airport of destination and for eFPLs with the GUFI. Also, IFPS rejects a duplicate flight plan from a different originator.

- Once an flight plan has been accepted for processing as a new flight plan, IFPS carries out initial syntax and semantics validation checks. Possible errors may be automatically or manually corrected.
- When IFPS has completed the syntax and semantic checks, it checks the route/trajectory provided in the flight plan. The checks it carries out are the following:
  - that equipment corresponds to the airspace requirements;
  - that the 4D flight profile is possible (i.e. airways/level/speeds/directions are available);
  - that the Flight Profile is available (i.e. timings for positions correct).

b) **Operational Replies to the Message Originator**

- The IFPS sends an Operational Reply Message (ORM) to the message originator after the completion of all checks, which indicates whether or not the message has been accepted. Messages sent to FP staff for manual processing may be corrected with or without reference to the message originator in accordance with operational procedures.
- If the flight plan is correct, an ACK (Acknowledge) feedback is sent to the message originator. If the flight plan is incorrect:
  - a REJ (Reject) feedback which includes errors (and in most cases a field POSRTE (Possible Route) which is an IFPS compliant route suggestion), or
  - a MAN (manual) message is sent, which means that an FP staff will attempt to correct it according to set procedures.

Additionally, in the eFPL related cases, as the submission is done via B2B, feedback via B2B is provided. The feedback is composed of a Submission Response (ACK, MAN, REJ) and in some cases of a Filing Status. For more details see IFPS Users Manual.

- There are 4 main classes corresponding to the type of error found by the IFPS in a flight plan or associated message:
  - Syntax (SYN) - occurs when data does not adhere to the prescribed formats;
  - Extended Flight Plan Message (EFPM) - when data in the submitted message is inconsistent either with other Items in that message or with the existing IFPS flight plan database, or there is insufficient data to create a flight plan;
  - Route (ROUTE) - when the data format and content in the route portion of the submitted message do not adhere to the prescribed formats and manner of specifying data, or are inconsistent with the NM CACD;

- Profile (PROF) - occurs when data inconsistencies or violations are found during the calculation of the 4D flight profile.

c) **Storage**

- The data from all messages which are accepted is stored in the IFPS Database set (IFPD).

d) **Distribution**

- The IFPS distributes the accepted messages to the ATS Units and the ETFMS for the IFR/GAT-iOAT flights. It automatically determines the required addressing for the messages within the IFPS distribution area, by use of the calculated flight profile. For flights which include a section outside the IFPS Zone or a section which is not IFR/GAT-iOAT, the IFPS does not automatically perform the addressing or distribution for that section.

e) **Re-processing**

- Each flight plan held in its valid flight plan database shall be re-processed against the CACD at certain time parameters. This process is intended to accommodate the on-line input of dynamic environment data such as RAD traffic flow rules and updates, or, route closures and openings, etc.
- Re-processing for each of the valid flight plans will occur automatically between EOBT-12 hours and EOBT. It will occur every 30 minutes starting at EOBT–X hours, (X is between 12 and 0, e.g. 12, 11.5, 11, 10.5, etc.).

(6) All IFR/GAT-iOAT flight plans and associated messages intending to operate within the IFPZ (or iOAT airspace) shall be submitted to the IFPS for processing. This shall include those flights where the flight rules are indicated as mixed IFR and VFR, shown as Y (IFR then VFR) or Z (VFR then IFR) in the Flight Rules of the flight plan and where all or part of the flight is operating within the IFPZ (or iOAT airspace) under IFR/GAT conditions or as iOAT flight plans.

(7) Any intended change of flight rules shall be associated with a significant point. The point at which the change of flight rules is intended to take place shall be a specified ICAO-named designator, a set of geographical co-ordinates, or a bearing and range from a named navigation beacon.

(8) The IFPS fully process only the IFR/GAT-iOAT portions of the flight plan and distribute the message to those ATC Units handling the IFR/GAT-iOAT portions of the flight plan.

(9) The IFPS undertakes only minimal processing of any VFR and OAT portion of a flight. The IFPS does not distribute the message to those parts of the flight indicated as VFR unless the message originator makes use of the re-addressing function. It shall remain the responsibility of the message originator to ensure distribution of the message to all those addresses requiring the message for any VFR portion(s) of the flight.

(10) It is a responsibility of the message originator to ensure that any VFR portion of a flight is filed in accordance with any requirements outlined by the relevant State.

(11) It is not allowed to fly VFR above FL195. When a flight transitions from VFR to IFR and the RFL for the VFR portion is 'VFR' and the RFL for the IFR portion is above FL195, the IFPS calculates the flight to be at maximum FL195 at the transition point (depending on the distance from the ADEP and the transition point).

(12) The IFPS checks the route of a submitted flight plan for the indicators "IFR" and "VFR".

(13) The IFPS confirms that the filed flight rules and any change of flight rules indicated in the route correspond. Where they do not, that message shall fail automatic processing and be passed for manual treatment by the FP (Flight Planning) staff.

(14) Any change of flight rules are processed automatically by the IFPS where these indicators are associated with a significant point.

5.3 Route and Profile Analysis process

(1) The full route extraction is only carried out for IFR/GAT-iOAT flight plans thereof intending to operate within the IFPZ. However, a profile calculation is carried out by the IFPS where data within the VFR portion of the route is syntactically correct. These data items are used in the calculation of the total estimated elapsed time and any speed/level changes at these data items shall also be taken into account.

(2) The IFPS calculates distribution of that flight plan and associated messages only for that part or parts of the flight operating under IFR/GAT-iOAT flight plan conditions. Where any portion of the flight operates under VFR conditions or as OAT within the IFPZ, the addressing for that part of the flight plan and any associated messages is not undertaken by the IFPS. Any necessary addressing for those VFR or OAT portions of that flight shall be carried out by the message originator or the aircraft operator, and such addressing may be included in the re-addressing function.

(3) Where a flight intends to change to/from IFR/VFR, this shall be indicated in the Flight Rules and in the route.

Note: Y in the Flight Rules indicates that the flight shall commence under IFR conditions and shall change to VFR. Z in the Flight Rules indicates that the flight shall commence under VFR conditions and shall change to IFR.

(4) Where required by the State, the message originator may include an indication of the speed and level of the flight at the point at which the change in flight rules takes place.

Examples
N0487F330 BUZAD T420 WELIN/N0430F190 N57 TNT/N0245A050VFR ……
N0487F330 BUZAD T420 WELIN/N0430F190 N57 TNT/N0245VFR VFR……
N0487F330 BUZAD T420 WELIN/N0430F190 N57 TNT/N0245VFR ……
(while not being ICAO compliant, this format is accepted by IFPS and the output will be as follows : …UN57 TNT/N0245VFR VFR…The first VFR indicates the FL and the second VFR indicates the change of flight rules).

Example
N0330VFR DCT POL/N0330F230 IFR N601 GRICE P600 GLESK
IFPS shall calculate the profile to be at POL at maximum F195 and no error is raised. Whenever the RFL for a VFR portion is above F195, then the message shall fail automatic processing and shall be passed for manual processing by the FP staff.

Examples
Y flight: N0330F230 BCN N864 NITON P17 POL/N0310F175 VFR …
Y flight: N0330F230 BCN N864 NITON P17 POL/N0310VFR …
Y flight: N0330F230 BCN N864 NITON P17 POL VFR …
Are not valid because the previous RFL before the VFR portion (upstream of POL) is higher than F195 (F230).
Solution: indicate a change of RFL below F195 at a point upstream of the point at which the transition to VFR is planned:
N0330F230 BCN N864 NITON P17 BARTN/N0330F190 P17 POL VFR …

Z flight: N0330F225 BCN/N0330F240 IFR N864 NITON P17 POL GRICE P600 GLESK
Is not valid because the RFL for the VFR portion is higher than F195.
Solution: indicate an RFL at or below F195 for the VFR portion:
N0330F195 BCN/N0330F240 IFR N864 NITON P17 POL GRICE P600 GLESK

(5) The flight profile is a representation of the 4D path that a flight is expected to follow between departure and arrival aerodrome. The profile calculation is required to validate the route of that flight, to determine the address list for the distribution of messages and to facilitate air traffic forecasting.

(6) All IFR/GAT-iOAT flight plans and associated messages for flights operating within the IFPZ (or iOAT airspace) shall be submitted to the IFPS for processing.

(7) The profile for any given flight must provide the means to determine the FLs and times at which it is expected to enter/overfly/exit any significant point that may be used as a potential parameter for validation, distribution and forecast.

(8) The IFPS checks all those messages submitted for processing. As far as possible, those messages shall be processed automatically, but some messages may require manual treatment by the FP staff. During the process of checking against the CACD and any resulting necessary automatic correction, the IFPS extracts the data in each message, including the route description and trajectory/profile elements if provided, and shall calculate a 4D profile for that flight based on that extracted information.

Note: The profile calculation does not take into account weather data or individual flight characteristics such as load sheets for individual aircraft (except when they are reflected in the trajectory/profile elements, EET), as it is the case with profiles calculated by aircraft operators.

(9) For profile calculation and route analysis, the IFPS uses the following items/ elements from the flight plan or associated message:

- Flight rules and flight type;
- Aircraft type and the corresponding performance data from the CACD;
- Aerodrome of departure and estimated off-block time;
- Initial speed and RFL;
- Route elements including change of speed/level;
- Aerodrome of destination, total estimated elapsed time;
- PBN, EET, DOF, DLE, RMK
  Trajectory/profile elements

(10) For FPLs and IFPLs:

In order to improve the IFPS profiles accuracy compared with the profiles as calculated by aircraft operators it is possible for message originators to include profile data in the sub-field RMK/.

The profile data that may be provided is:

- Taxi (taxi time): for IFPS profile calculation, a standard taxi time dependent on the aerodrome of departure is used. If the airline operator considers holding a more accurate taxi time, then it may be inserted.
- Take-off weight (TOW): for each aircraft type, the NM CACD has 3 performance tables: low, nominal and high. By default, the nominal data is used. The provision of the take-off weight may result in IFPS using another table when calculating a profile.
- Distance at location (DAL).
- Top of climb (TOC): position for every transition from a climb phase to a cruise phase.
- Top of descent (TOD): position for every transition from a cruise phase to a descent phase.
- Bottom of climb (BOC): position for every transition from a cruise phase to a climb phase.
- Bottom of descent (BOD): position for every transition from a descent phase to a cruise phase.

(11) Normally profile data shall be automatically generated by the CFSPs used by the operator. Profile data should not be created manually except for TAXI and TOW.

(12) Whenever present in a message, TAXI, DAL, TOW, TOC, TOD, BOC BOD shall be used by the IFPS for the profile calculation, providing that they do not contain errors in format or discrepancies in content. The IFPS does not raise any error for syntactically incorrect elements with the RMK/ sub-field or in the specific ADEXP fields. Such syntactically incorrect elements shall be ignored by the IFPS.

(13) The message originator may indicate the SID and STAR designators (for aerodromes inside the IFPZ) in the flight plan route submitted to the IFPS. Whenever present, such designators shall be used by the IFPS for the profile calculation.

(14) For the profile data provided within the sub-field RMK/ the following format shall be used:

- TAXI: Estimated TAXI time at the aerodrome of departure. Format: TAXI: <hhmm>. Example: RMK/TAXI: 0012. Maximum value accepted is 1 hour and 30 minutes.
- TOW: Actual Take-Off Weight. Format: TOW:<weight> weight to be expressed in kilograms. Example: RMK/TOW:137500

  Note: DAL is only supported for the aerodrome of destination and when the route does not contain any OAT, VFR or STAY portions.

(15) For eFPLs: See chapter 5.6

(16) The 4D flight profile calculated by the IFPS for each IFR/GAT-iOAT flight plan thereof within the IFPZ (or iOAT airspace) shall be based on the on the data contained in the flight plan. In case of eFPLs, if the trajectory/profile elements provided is/are found to be inconsistent when compared to the profile as calculated by the IFPS, then it is discarded.

(17) In case of eFPL If the trajectory/profile elements provided is/are found to be consistent when compared to the profile as calculated by the IFPS, then it is used for the profile calculation.

(18) For those flights that are flying across two AIRAC (EOBDT in one AIRAC and landing in the following AIRAC), IFPS checks the profile against the constraints of both AIRAC. However the IFPS cross AIRAC check applies only to the flight

plan initial validation and subsequent associated messages (delay and modification) and does not apply to IFPS revalidation.

(19) In addition, whenever present in a message, the estimated elapsed time(s) (EET) shall be used by the IFPS for profile calculation, together with the total elapsed time (Item 16B). Prior to using the EET information, the IFPS validates it against its own calculated EETs allowing for the provided EETs to be within a pre-defined window around the EETs as calculated by the IFPS. In the case the provided EET information is found to be outside this window, the message shall not be invalidated. In this case the IFPS shall retain its own calculated EETs.

(20) It should be noted that IFPS will use EET given at significant points (providing that those points are on the route) as well as EET given at FIR boundaries.

Note: Whenever a flight plan route is modified, the message originator shall ensure that the estimated elapsed times (EET) are also modified in order to be consistent with the new route and also any profile data if provided in the original message.

(21) Whenever present in flight plan messages submitted to the IFPS, TAXI, DAL, TOW, TOC, TOD, BOC and BOD elements shall be removed from messages transmitted to external addresses.

(22) The profile shall be a calculated point profile, where the level and time of that flight for each specific point along the route shall be calculated by the IFPS. The profile shall consist of a departure phase, an en-route phase and an arrival phase.

(23) Although it may not be required by State AIP publication, the message originator may indicate the full SID and STAR designators in the flight plan route submitted to IFPS. Whenever present, such designators shall be used by the IFPS for the profile calculation. The IFPS ensures that in messages distributed to ATC, the SID and STAR designators will not be present when they are not required.

(24) A taxi time shall be included in the profile calculation (either when provided within the flight plan data or else, the taxi time held in the NM CACD).

(25) The estimated elapsed time(s) (EET in Item 18) shall be used by the IFPS for profile calculation, together with the total elapsed time (Item 16b). IFPS compares the calculated total EET to the total EET indicated in the message. Prior to using the EET information, the IFPS shall validate it against its own calculated EETs allowing for the provided EETs to be within a pre-defined window around the EETs as calculated by the IFPS. In the case the provided EET information is found to be outside this window, the message shall not be invalidated. In this case the IFPS shall retain its own calculated EETs. It should be noted that IFPS will use EET given at significant points (providing that those points are on the route) as well as EET given at FIR boundaries.

(26) The calculated point profile shall be the basis for further checking of the route and shall be used to determine the point of entry to or exit from the IFPZ (or iOAT airspace) where applicable.

(27) The profile shall be used to check the flight path against the published requirements including, ATS Route, Terminal Procedure, DCT, FRA and Airspace requirements (these requirements are published in AIPs, RAD appendices, EAUP/EUUP and NOTAMs).

(28) Where the IFPS calculates a flight to violate airway availability or RAD conditions, or where a flight is not compliant with 8.33 kHz or RVSM requirements, that message shall fail automatic processing and may be passed for manual processing by the FP staff.

(29) The IFPS identifies a list of those ATS units to which that message shall be sent, based on the calculated profile. The profile calculation shall produce a list containing all airspaces crossed by the flight path. It shall contain only those airspaces calculated to be entered by any portion of an IFR/GAT-iOAT flight plans within the IFPZ (or iOAT airspace).

Note: The use of either IFPSTOP/IFPSTART or VFR/IFR and OAT/GAT has an influence on the profile calculation. IFPSTOP/IFPSTART is a manual processing function that results in many, but not all, errors being ignored by the IFPS. That portion of a route within an OAT or VFR designation is considered only as text, except where a STAY designator is found after the first point of a VFR/OAT portion (in such a case, the STAY information is taken into account).

5.3.1 Route Analysis

(1) Route Analysis process is consisted of four sub-processes:

- Parsing of route description, calculation and validation of Track 2D;
- 4D flight profile calculation;
- 4D flight profile validation (RAD, DCT, …);
- Adapting 4D flight profile to that of the AO provided AO 4D (AO4D), within a predetermined tolerance.

(2) Route Analysis is responsible for analysing the route description given in either:

- Item 15 from ICAO messages;
- The ROUTE field for ADEXP messages;
- Route/Trajectory information for FF-ICE FIXM messages.

(3) Route Analysis processes the route field provided in an EFPM (Extended Flight Plan Message) and outputs an EFPM, possibly with modified route information and an address list. Processing status is set to OK or FAIL.

(4) Any errors marked in the EFPM to be ignored are recorded and ignored at the appropriate places.

5.3.2 Route Extraction

(1) If Route Extraction successful further processing is performed:

- Profile Generation takes place for the EFPM including its extracted route;
- Message distribution is carried out to involved stakeholders.

(2) If Route Extraction is unsuccessful one or more errors are raised and added to the error list component of the EFPM.

(3) Route Extraction expands the route produced by Route Analysis so that all points along the route are derived. The extracted route will identify all points on the IFR/GAT-iOAT portion of the route in the IFP_DIST contained in the EFPM.

5.3.3 Route processing

(1) Route processing performs parsing, validation and processing of route information. The result of this process (when valid) is the curtain. It contains the 2D-track and time and level information for the complete flight. It also contains all geometric and volumetric information about airspace penetration.

(2) Route processing requires the following time related data:

- ETOT (Estimated Take Off Time, or time at first point when no ADEP);
- EET at oceanic boundary if present in the flight plan.

(3) The Taxi Time may come from one of three sources and should be selected in the following order of priority, depending on the availability of the information:

- (in ETFMS only) Taxi time information from REA or DPI message
- Updated taxi time when available for the ADEP runway (from CACD);
- Supplied in the flight plan or updated message
- Default runway taxi time at the aerodrome of departure (from CACD).

In case of eFPL, taxi time will be calculated based on the ETOT and EOBT.

(4) The IFPS does not cater for the processing of pure VFR flights. If a flight plan has the 'VFR' flag set from analysis of the flight rules field, then an error status is raised (because the flight plan is not of concern to the IFPS) and the message is automatically rejected, unless the modification message contains change to pure VFR.

(5) Profile Generation calculates a 4D flight profile from an expanded route produced by the Route Extraction process. This consists of a list of points with estimated times and levels.

(6) The 4D flight profile is a list of all SPs presented in chronological order, starting with the ADEP or the first SP (when the departure is outside the IFPS Zone, or ZZZZ or AFIL), and terminating with the ADES (when it is inside the IFPS Zone and not ZZZZ) or the last SP. Each point has an associated level and time-over.

(7) Once the aircraft has taken off, there may be minor deviations in the flight path actually taken compared to the original plan, e.g. a different FL may be required because of local congestion. For this reason, the IFPS does not attempt to derive a precise profile such as that implemented for the ETFMS. Instead, it determines a band around an estimated profile and ensures that all ATC Units intersected by the band are notified of the flight. This can result in a slight over-delivery of flight plans, but results in a safer ATC situation.

5.3.4 Aerodrome of departure

(1) The IFPS checks the departure aerodrome in all submitted messages. The system first checks to identify the ICAO aerodrome code, ZZZZ or AFIL; where such identification cannot be made, that message shall be passed for manual processing. Those flight plans containing ZZZZ with no sub-field DEP information shall fail automatic processing and be passed for manual processing.

(2) When the sub-field DEP is a unique geographical coordinate, that information will be inserted at the beginning of the route field.

(3) In the event that flight plans containing ZZZZ and a known ICAO aerodrome designator in the sub-field DEP are submitted for processing, the IFPS automatically replaces the ZZZZ indicator with that known ICAO designator give in the sub-field DEP.

(4) When the departure aerodrome has been identified, the EOBT is checked against the current time in the IFPS and against any DOF given in that message.

(5) The IFPS accepts flight plans that do not contain a DOF (Note eFPL always has DOF embedded in the date/time group). In such cases, the IFPS shall automatically assume that the flight is to take place in the 24 hour period starting 30 minutes in the past when compared to the current time, and shall add the appropriate DOF to that message.

(6) Where a DOF is included in the flight plan, the IFPS takes that information into account when processing the EOBT.

(7) For practical reasons it shall be possible for the IFPS to process those flight plans that contain an EOBT of more than 30 minutes in the past compared to the current IFPS system time. This is only possible where the EOBDT (i.e. the combination of the EOBT and DOF) is not more than 12 hours in the past when compared to the current IFPS system date/time. The flight plan fails automatic processing but may be manually forced through processing by the FP staff.

(8) It is not possible to alter the departure aerodrome by means of a message.

5.3.5 Aerodrome of destination

(1) The IFPS processes those IFR/GAT-iOAT flight plans and associated messages or parts thereof intending to operate wholly or in part within the IFPZ.

(2) In order to help determine whether a flight operates wholly or in part within the IFPZ, the IFPS shall identify the geographical location of the destination aerodrome, where that aerodrome of destination is given as a known ICAO code.

(3) Where no ICAO designator exists for the aerodrome or point of destination, that aerodrome or point shall be given as ZZZZ with corresponding details, where known, in the sub-field DEST.

(4) The total Estimated Elapsed Time (EET) given is considered by the IFPS to be the total time calculated for that flight from departure to the point at which that flight lands at the aerodrome or point of destination.

(5) Where:

- An alternate destination aerodrome is given, that aerodrome shall be given as a known ICAO code, otherwise ZZZZ shall be used.
- ZZZZ is used; the corresponding details shall be given in the sub-field ALTN. It is possible to indicate more than one sub-field ALTN. The IFPS checks Item 16 in all submitted messages. The system first checks to identify any known ICAO aerodrome codes or ZZZZ that shall be present; where such identification cannot be made, that message fails automatic processing and be passed for manual treatment by the FP staff.
- ZZZZ is found for the destination aerodrome, the IFPS checks for the sub-field DEST giving the name of the destination. Should no sub-field DEST information be given when ZZZZ is used for the destination aerodrome, the message fails automatic processing and is presented for manual treatment by the FP staff.
- ZZZZ is used for the destination aerodrome and a known aerodrome of destination is used in the sub-field DEST the IFPS replaces ZZZZ by the known DEST. Where the sub-field DEST is a unique geographical co-ordinate, that information will be inserted at the end of the route field.
- ZZZZ is found for the alternate aerodrome, the IFPS checks for the sub-field ALTN giving the name of the alternate destination aerodrome. Should no sub-field ALTN information be given when ZZZZ is used for the alternate aerodrome, the message fails automatic processing and is presented for manual treatment by the FP staff.
- ZZZZ is used for the alternate aerodrome and a known alternate aerodrome is used in the sub-field ALTN the IFPS shall replace ZZZZ by the known ALTN.

Note: The IFPS shall not distribute any flight plans or associated messages to the alternate or en-route alternate aerodromes given in the flight plan. It shall remain the responsibility of the message originator to ensure the distribution of the flight plan and all subsequent associated messages to the alternate or en-route alternate aerodromes.

(6) It is possible for the message originator to use the Re-addressing function to ensure message distribution to any alternate aerodromes.

(7) Following the destination and alternate aerodrome checks, the IFPS checks the time given for the total EET, against the profile calculation made by the IFPS. Should there be a discrepancy of more than 40%, 120% or 200% (depending on the length of that flight) between the given and calculated total EETs, that message fails automatic processing and is passed for manual treatment by the FP staff. This check is not performed for those flights with a flight type given as 'X'.

Note: Where the Ignore function is used against a total EET error to manually force a message through processing, the total EET of that message calculated by the IFPS shall be used to calculate the flight profile.

5.3.6 Terminal Procedure (TP)

Aerodrome requires a TP to be included in the IFPS flight plan distribution

(1) When a TP is specified in the filed route of a flight plan or associated message received, the IFPS checks the validity of that TP.

- Where the TP is valid, the IFPS shall accept and transmit that TP in the distributed message.
- Where the TP is not valid, the IFPS shall propose a valid TP where existing that shall be included in the distributed flight plan after validation by the FP staff.
- Where no valid TP can be proposed, the message will be presented with the error message: 'TP not valid, DCT is assumed, other possibilities are NONE' to the FP staff for manual correction. Connecting points should be found, to allow valid TP to be included by the IFPS in the distributed messages.

(2) When a TP is not specified in the filed route of a flight plan or associated message received, the IFPS:

- Checks that the first/last point extracted from the filed route is a connecting point (CP) from a valid TP for that aerodrome and if so, insert in the distributed message a valid TP.
- Where the first/last point extracted from the filed route is not a CP from a valid TP for that aerodrome, raise a SID/STAR DCT limit for that aerodrome and present the message for manual correction in order for the FP staff to find a CP that connects the route to a valid TP.

Aerodrome does not require a TP to be included in the IFPS flight plan distribution

(3) When a TP is specified in the filed route of a flight plan or associated message received, the IFPS checks the validity of the TP:

- Where the TP is valid, the IFPS shall use it for its internal profile, but shall not transmit it in the distributed message.
- Where the TP is not valid, the IFPS shall use a valid TP where existing for its internal profile but shall not transmit it in the distributed message.

- Where a TP exists for that aerodrome, the route field should be corrected to connect that aerodrome with a CP of that valid TP.
- Where no TP exists, but CPs from a DCT route segment is defined for the aerodrome, one of those CPs should be inserted.
- Where no CPs are defined for that aerodrome, a point that is within the SID/STAR DCT limit should be inserted.

(4) When a TP is not specified in the filed route of a flight plan or associated message received, the IFPS accepts the flight plan where the first/last point extracted from the route field is within the maximum SID/STAR DCT limit for that aerodrome providing that it is compliant with the DCT cross-border restriction and:

- Where the first/last point of the route field exceeds the maximum SID/STAR DCT limit, check that the first/last point specified in the filed route is a CP from a valid TP. If so, the TP will be used in its internal profile but not transmitted in the distributed message.
- When the first/last point specified in the filed route is not a CP from a valid TP, raise a SID/STAR DCT limit for that aerodrome and present the message for manual correction by the FP staff.
- Where a CP exists for that aerodrome, it should be inserted.
- Where no CP exists for that aerodrome, a point that is within the SID/STAR DCT limit should be inserted.

(5) To be considered valid, a terminal procedure must:

- Not have any active TP restrictions (type of flight, aircraft type and equipment); and
- Be available in time and level (the minimum level on the first/last route segment is ≤ to the RFL); and
- Connect to the route; and
- Belong to the aerodrome.

5.3.7 Speed / Level

(1) The IFPS verifies that the speed and level in the route corresponds to the aircraft performance of the indicated aircraft type of the flight plan or associated message. Where the required format is not followed, or the indicator is beyond the performance of that aircraft type, or the RFL in a visible portion (GAT, IFR, IFPSTART) does not end with a zero, the message shall fail automatic processing and shall be passed for manual processing by the FP staff.

(2) Where a speed indicator is not present in a flight plan or associated message submitted to the IFPS for processing, the IFPS shall automatically insert a given average speed, in knots, for that aircraft type at the indicated level.

(3) The IFPS uses the indicated speed and level given in any flight plan or associated message submitted to the IFPS for processing to calculate the profile of that flight, and to verify the availability of the route as filed. An appropriate error shall be raised when any portion(s) of that route are calculated as being not available for that flight. The profile shall be adapted with a performance factor, which expresses the difference between the requested speed and the optimal speed (taken from the performance table) at RFL. This factor is applied to the climb and descent speed. In case of eFPL, the calculated profile can be adjusted to

match the AO 4D if the difference between the calculated profile and the AO profile is within a predetermined tolerance.

(4) The IFPS takes the point at which a change in speed/level is indicated to be the point at which the change in speed and/or level is to commence, and the profile shall be calculated accordingly.

Note: It is recognised that a number of aircraft operator flight planning systems do not interpret speed level change information in accordance with the ICAO interpretation. This may give rise to flight plans being invalidated where a flight plan indicates a change of level at a point from which a RAD level restriction or unavailable route applies. In order to ensure that the constraint is fully respected (and thus ensure automatic processing by IFPS) flight plan originators should submit flight plans that adhere to the ICAO interpretation of a speed and level change.

(5) Where a flight plan or associated message submitted to the IFPS for processing relates to a flight entering the OCA Oceanic Airspace, the IFPS shall check for the required speed and level conditions at that Oceanic entry point.

(6) Where for westbound traffic the speed at the Oceanic entry point is not given as a Mach number, the IFPS shall automatically convert any given value to a Mach number, and output such.

(7) Where for westbound traffic no speed and level indication at the Oceanic entry point is given, the IFPS shall automatically insert such, basing the values on the last given speed and level indications in the route field of that flight.

5.3.8 Point / Significant Point

(1) The IFPS requires that all flight plans or associated messages submitted to the IFPS for processing shall contain details of the route intended to be flown by that flight.

(2) Where a route is made up of more than a direct (DCT) route between the departure and destination aerodromes, that route shall give details of any relevant significant geographical points.

(3) Where a flight intends to fly on an airway, the route given in the flight plan shall indicate the point at which the flight intends to join that airway and the point at which the flight intends to leave that airway.

(4) Any flight intending to enter or leave the European RVSM airspace from or to non-RVSM airspace within the vertical limits of the RVSM airspace is required to indicate in the route of the flight plan or any associated messages the RVSM entry/exit point plus the planned speed and level at that point.

(5) Where a navigation aid name is given in the route of a message submitted to the IFPS for processing, the IFPS confirms that the name given is correct and unambiguous. In the event that the IFPS cannot clearly identify a navigation aid, that message fails automatic processing and is passed for manual treatment by the FP staff.

(6) Where a navigation aid is indicated as being a portion of an airway or a terminal procedure in a message submitted to the IFPS for processing, the IFPS verifies that the navigation aid is a portion of that airway or terminal procedure. Where a navigation aid inside the IFPZ (or iOAT airspace) cannot be identified by the IFPS, the IFPS fails the automatic processing of that message and passes it for manual treatment by the FP staff.

Note: Where geographical coordinates are given in a route, the IFPS checks those coordinates against the coordinates of the known navigation aids held in the NM CACD, and subsequently carry out the processing described above.

(7) When there are several same coded designators of navigation aids, the CACD creates homonyms in order that the IFPS is able to unambiguously identify those points when they are given in the routes of messages submitted to the IFPS for processing.

(8) Where a navigation aid is preceded or followed by another navigation aid without the indication of either DCT or an airway, the IFPS checks if an available airway exists between those two points..

(9) Where the IFPS cannot determine an airway between two navigation aids, then DCT shall be assumed and checked against DCT/FRA rule..

5.3.9 Airway / ATS route / Route

(1) The IFPS requires that all flight plans or associated messages submitted to the IFPS for processing shall contain details of the route intended to be flown by that flight. Where the IFPS cannot determine an airway between two navigation aids, the message fails automatic processing and is passed for manual correction by the FP staff.

(2) The minimum possible for the route is a direct (DCT) route between the departure and destination aerodromes; the availability of that direct route, and any other routes mentioned shall be verified by the IFPS. Where a flight intends to fly on a route, whether a named airway, or a direct routeing, the route given in the flight plan or any associated messages shall indicate the points at which the flight intends to join and leave that route.

Note: Where a flight intends to fly only on a DCT route between the departure and the destination aerodrome, the IFPS may accept this route as the only route entry.

(3) In non FRA environment, the IFPS verifies the DCT against any cross border or maximum DCT limit requirements (both en-route and aerodrome). In FRA, it will be checked against FRA requirements/restrictions. Additionally a State may declare specific DCT portions as forbidden or allowed, regardless of the DCT limit of the airspace. The allowed maximum DCT length may be defined per airspace slice and type of flight. The relevant State may declare the crossing of an international boundary on a DCT routeing to be forbidden or allowed.

(4) The designator T for truncated route is not accepted by the IFPS.

(5) The route information is used in the profile calculation for that flight. The IFPS does not check the cruising levels against the FLOS defined for the flown segment except for the entry and exit requirements of the EUR RVSM airspace.

(6) The IFPS checks the route details in any message submitted to the IFPS for processing, and where a route designator is found, the IFPS confirms that the given designator matches that one given in the CACD as being the correct route between the given points. Where no such match is found, the IFPS invalidates those messages.

(7) The IFPS uses an algorithm to determine which point to extract for the profile calculation and terminal procedure checking.

- If the route starts with a route rather than a point - the first point of the route;
- If the route ends with a route rather than a point - the last point of the route.

(8) The IFPS verifies that the given point preceding the ATS route and the given point following the ATS route are portion of that ATS route.

(9) Where:

- An airway is preceded or followed by another airway without the indication of a point at the intersection of those airways, the IFPS checks if an available point exists between those two airways. The IFPS uses an algorithm to determine if the point shall be inserted automatically between those two airways.
- The IFPS cannot determine a unique intersection between two airways, the message is invalidated.
- When a DCT is filed between two points, the IFPS confirms whether there is an available airway between those two points. Where such is found, the IFPS validates the segment and maintains the DCT in the flight plan distribution.
- The airway between the two points is not available; the message fails automatic processing and is invalidated.
- No unavailable route is found between those two points, the availability of the filed DCT is confirmed against the unavailable DCTs and the maximum allowed DCT length for that airspace. If the DCT fails either of these checks, the message fails automatic processing and is passed for manual correction by the FP staff.
- A DCT is filed across an international boundary; the IFPS confirms whether or not the relevant States / FABs / ANSPs permit the use of cross-border DCT routes. If the DCT fails this check, the message fails automatic processing and is passed for manual correction by the FP staff.

(10) The IFPS calculates the profile of the flight and check the availability of the requested route in respect to time, level and any other restriction detailed in the RAD document.

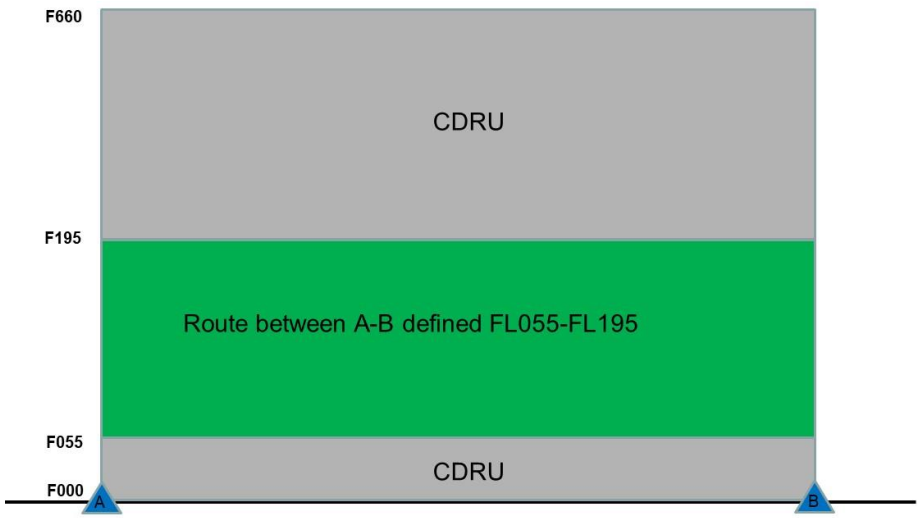
(11) The IFPS drops any repetitive ATS routes and outputs the route in a simplified form.

Example
Submitted to the IFPS: LATEK UN871 OBUTO UN871 GONUP UN871 TOU UN871 GIPNO
Output by the IFPS: LATEK UN871 GIPNO

5.3.10 CDR Undefined (“undefined airspace”)

(1) In NM systems, CDR U, indicates a route which is not defined H24. When the route is undefined it means that it does not exist.

Example: between two points, a lower route is defined from FL055 (first available level is FL060) until FL195 (last available level is FL190), and there is no co-located upper route.
Then from FL000 until FL055 and from FL195, the “non-defined” route is considered to be CDRU.



CDRU

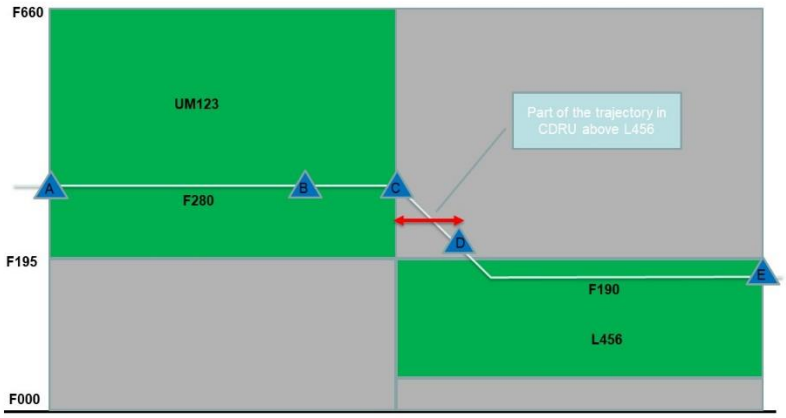
Figure 35: Example of CDRU

(2) In order to ease flight planning, IFPS has a tolerance that allows some portion of the trajectory to be in CDRU.

(3) Without this tolerance, numerous flight plans would fail IFPS checking without any possibilities to re-route the flight in order to have an error free flight plan.

(4) This is an example that explains why that tolerance is needed:

ROUTE…F280 A UM123 C/N0425F190 L456 E…



Tolerance for part of the trajectory in CDRU

Figure 36: Example – why tolerance is needed in CDRU

(5) According to ICAO and as per IFPS calculation, RFL of F190 indicated at C means that the flight reaches C at F280 and starts its descent to F190 from the point C.

(6) Above L456, between C and D there is no upper route defined. Below UM123, between A and B and B and C there is no lower route defined. This is considered to be CDRU by IFPS.

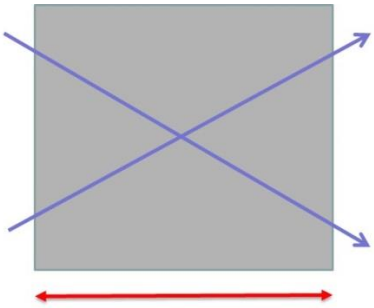
(7) Without that tolerance, the flight trajectory would have to transition from UM123 to L456 exactly at FL195 (at the corner of the two green blocks). To achieve this, the descent would need to be indicated at an upstream point from C. This is

virtually impossible to have a point (in this example B) that would be at the exact distance from C and based on the aircraft performance, would guarantee the transition between the two routes, exactly at FL195.

IFPS parameters for the tolerance:

(8) IFPS has two parameters to define the tolerance.

- Maximum length in climb or descent in CDRU portion*: 40 NM.
  *: portion means a section of a profile that uses a given route. It can be composed of one or more route segments.

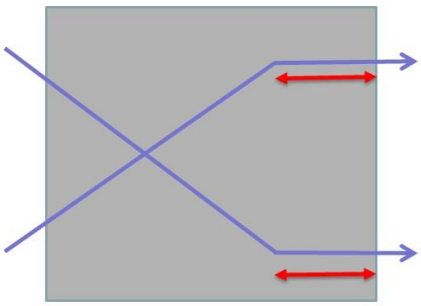


Flight portion fully in climb or fully in descent (this represents one or more route segment of the same route):
- Portion length is less than 40 NM: no error
- Portion length is more than 40 NM: error

Maximum Length climb/descent in CDRU

Figure 37: Example of maximum length in climb/descent parameter

- Maximum length of the cruise portion of a segment* (percentage of the segment length): 40%.
  *: segment means a section of a profile made of two consecutive points.



Flight segment of a route (two consecutives points) with a partial cruise:
- Cruise length is less than 40% of the total distance of the segment: no error
- Cruise length is more than 40% of the total distance of the segment: error

Maximum Length cruise in CDRU

Figure 38: Example of maximum length of cruise of segment parameter

5.3.11 Estimated Elapsed Time

(1) The IFPS shall check any sub-field EET entries in messages submitted to the IFPS for processing. Where such entries are found, the IFPS shall check for

compliance with the required format, and pass those messages for manual processing by the FP staff where the required format is not followed.

(2) The IFPS shall use the values given in EET entries for calculating the flight profile when such are found to be within an acceptable window compared with the EET calculated by IFPS.

(3) It shall be possible for a message originator to remove the EET indicators from the sub-field EET by sending a modification message. The modification message shall contain all the previous Item 18 sub-fields except the EET sub-field.

5.3.12 Aircraft type

(1) The IFPS shall accept the approved ICAO designators for aircraft types in a flight plan or associated message. Where an aircraft does not have such a designator, or the aircraft type is not known, the message originator shall insert 'ZZZZ' in the flight plan or associated message. The message originator shall also then include the sub-field TYP that shall contain details of the aircraft type, preceded by the number of aircraft, as necessary.

(2) As unique resource of the aircraft performances, NM systems are utilising Aircraft Performance Model (APM) with corresponding database - the Aircraft performance data of BADA (Base of Aircraft DAta).

(3) BADA is being maintained and developed by the EUROCONTROL.

5.3.13 Anticipated climb and descent

(1) When a climb/descent is planned to commence at certain point, the flight must already have achieved previous FL specified in the flight plan. In some cases, NM system will try to achieve this requirement by using different climb/descent rate. If, even when using an aggressive climb/descent rate it is not possible for the profile to achieve previous FL by the point where new change would commence, NM system will start climb / descent earlier on the previous route segment (starting somewhere on the previous route segment).

Example:

....N0389F190 SAU G39 SECHE/N0444F360 UT122 NARAK/N0440F380....
To commence a climb at NARAK to FL380, the flight must already be at FL360 at that point. As this is not the case, climb to FL 360 starts before point SECHE.

5.3.14 PBN Specifications

(1) In respect to Performance-based Navigation (PBN), AOs are to indicate PBN (RNAV and/or RNP) capability in the flight plan only if the aircraft and flight crew are appropriately certified and operationally approved.

(2) In that case, AOs should file an "R" (PBN) together with the navigation sensor(s) in Item 10A (Equipment and Capabilities) and list the approved PBN capabilities under the PBN/ indicator in Item 18 (Remarks).

(3) The following table includes the PBN descriptors, which the AOs should file in the flight plan for relevant PBN specification/s:

NAV SPEC	Permitted Sensors	Item 10A	Item 18 PBN/
RNAV 10	GNSS	R, G	**A1**
	INS/IRS	R, I	**A1**

	GNSS & INS/IRS	R, G, I	**A1**
RNAV 5	INS or IRS	R, I	**B5**
	VOR/DME	R, D, O(1)	**B4**
	DME/DME	R, D	**B3**
	GNSS	R, G	**B2**
	All sensors above	R,D, I, G, O(1)	**B1(4)**
RNAV 2	DME/DME/IRU	R, D, I	**C4**
	DME/DME	R, D	**C3(5)**
	GNSS	R, G	**C2**
	All permitted sensors	R, D, I, G	**C1(4)**
RNAV 1	DME/DME/IRU	R, D, I	**D4**
	DME/DME	R, D	**D3(5)**
	GNSS	R, G	**D2**
	All permitted sensors	R, D, I, G	**D1(4)**
RNP 4	GNSS	R, G	**L1**
RNP 1(2)	DME/DME/IRU	R, D, I	**O4**
	DME/DME	R, D	**O3(5)**
	GNSS	R, G	**O2**
	All permitted sensors	R, D, I, G	**O1(4)**
RNP APCH	LNAV	R, G	**S1(6)**
	LNAV/VNAV	R, G	**S2**
	LPV	G, B(3)	
RNP AR APCH	LNAV/VNAV with RF	R, G I(7)	**T1(6)**
	LNAV/VNAV without RF	R, G I(7)	**T2**

Table 55: PBN Specifications

Notes:

1. *In Item 10A, the letter "O" does not need to be filed in if letter "S" for standard equipment is already used.*
2. *The RNP 1 specification is based on GNSS. Although some aircraft are capable of RNP 1 with DME/DME, the suitability of the DME infrastructure for RNP 1 applications needs to be carefully demonstrated before this is approved by a State and published in the AIP. The publication of DME/DME based RNP 1 applications is therefore expected to be very limited and AOs should be aware that filing other than O2 or O1 in Item 18 is unlikely to enable them access to RNP 1 routes/procedures.*
3. *Contrary to other PBN capabilities, the RNP APCH to LPV capability does not require the use of the letter "R" in Item 10 or the use of a PBN code Item 18. AOs should indicate LPV capability in Item 10A with letter B.*
4. *Where applicable, B1, C1, D1 or O1 should be used instead of listing each individual sensor code for that certified specification.*
5. *If C4, D4 or O4 are used, C3, D3 or O3 respectively should not be used in addition.*
6. *If either S2 or T1 is used, S1 or T2 respectively should not be used in addition.*
7. *If the procedure requires the carriage of an INS/IRS for extraction, then "I" should be filed in Item 10A.*

(4) The AOs should indicate all applicable PBN specifications following the PBN/ indicator in Item 18. The PBN/ indicator can contain up to a maximum of 8 entries (PBN descriptors), i.e. a total of not more than 16 characters. The most relevant descriptors for the intended flight should be put as a priority under the PBN/ indicator in Item 18. Other codes can be filed under the NAV/ indicator in Item 18 (together with Z in item 10a).

(5) Operators of State aircraft not approved for RNAV 5 or RNAV 1 operations shall not insert any of the "B" or "D" descriptors within the PBN/ indicator of Item 18 of the flight plan. Instead, the letter "Z" shall be inserted in Item 10a and NAV/RNAVX shall be inserted in Item 18 of the flight plan.

(6) Where a failure or degradation results in the aircraft being unable to meet the RNAV 5 functionality and accuracy requirements before departure, the operator

of the aircraft shall not insert any of the "B" descriptors within the PBN/ indicator of Item 18 of the flight plan. Since such flights require special handling by ATC, the letter "Z" shall be inserted in Item 10a and Item 18 shall contain NAV/RNAVINOP.

5.4 Common Flight Planning Processing

5.4.1 IFPS Proximity Check to an AUA Border

(1) The IFPS check known as "flying along the border" is done to avoid flight planning on or adjacent to, an AUA border. This IFPS check is performed only when flying along lateral AUA borders and applies across the whole IFPZ. This IFPS check is also done in Free Route Airspace but is not a check limited to FRA.

(2) The IFPS detects and invalidates trajectories (filed as DCT) which are "aligned" with operational airspace borders. Operationally, these trajectories are not acceptable and force additional coordination between ATC Units.

(3) A trajectory (filed as DCT) shall be "aligned" with an AUA border if it is **too close** to the airspace border **for a considerable distance** where:

- "Too close" parameter is within 0.5NM from the AUA border; and
- "Considerable distance" parameter is 15NM or more.

Flight plan invalidation

The IFPS error is raised when a trajectory between two points filed as DCT (A DCT B) is within 0.5NM of an AUA border for at least 15NM (see Figure 39). The error (PROF53) states that the DCT segment is not allowed due to "distance" exceeding along airspace border between AUA1 and AUA2.

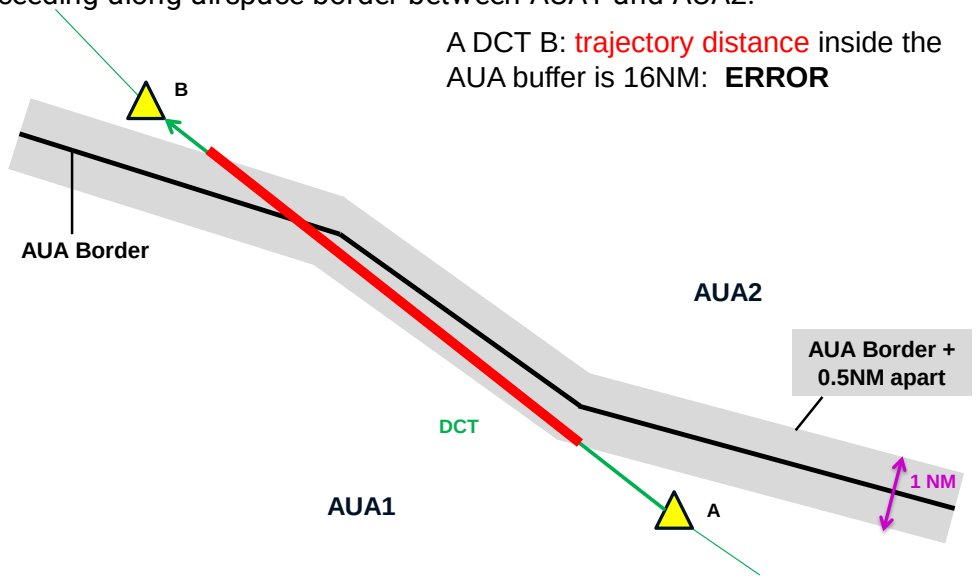


Figure 39: Example trajectory of DCT in close proximity to AUA border - Flight plan is invalidated

Flight plan validation

The IFPS error will not be raised whenever the:

- Trajectory between two points filed as DCT (A DCT B) is within 0.5NM of an AUA border for less than 15NM (see Figure 40 and Figure 41).

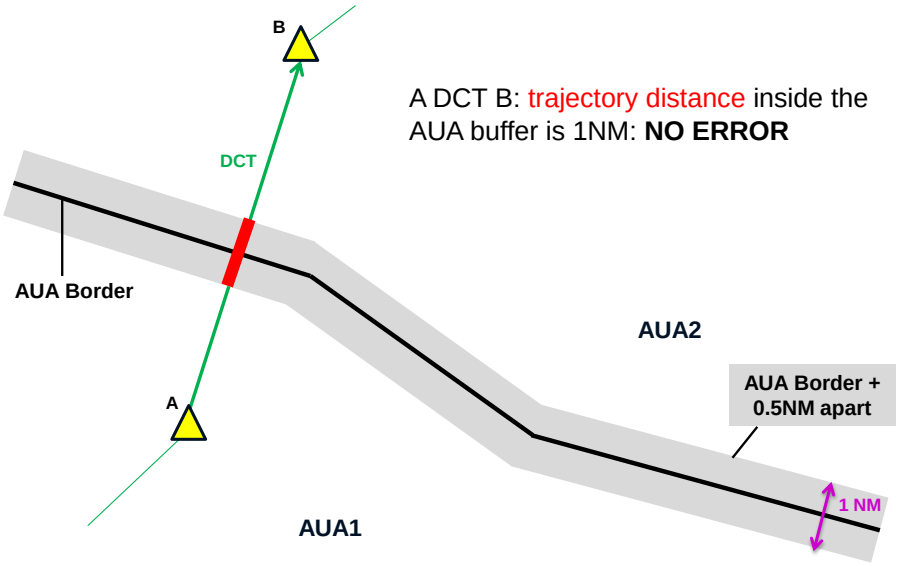


Figure 40: Example trajectory of DCT in close proximity to AUA border - no error

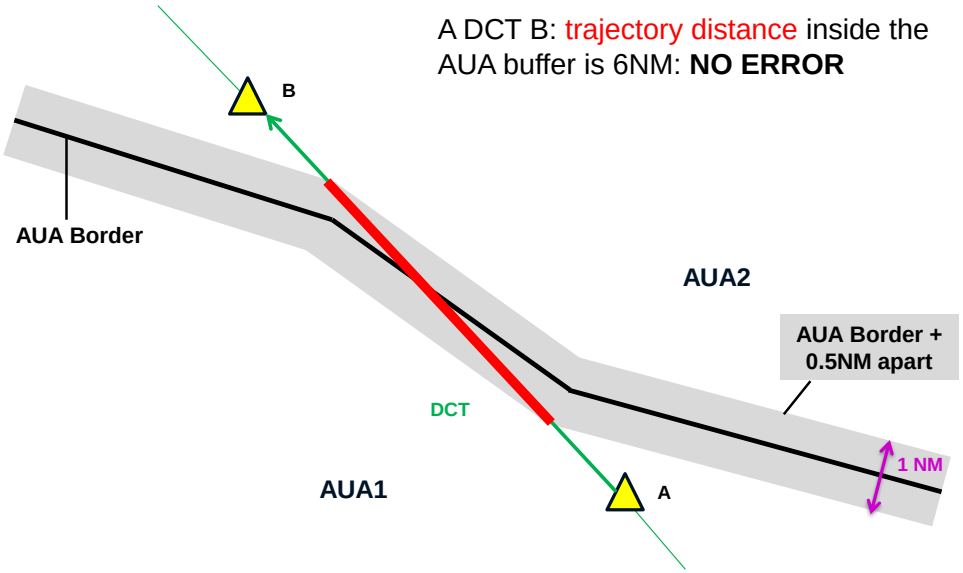


Figure 41: Example trajectory of DCT in close proximity to AUA border - no error

- **Two** AUAs belong to the same State / ANSP (same first two letters. Example: **LF**MM and **LF**BB);
- **Two** AUAs are of type **OCA** (Oceanic AUAs);
- **One** AUA is of type **OCA** (Oceanic AUA) and the **other** is of type **NON IFPZ** (non-IFPZ AUA).

(4) Currently IFPS is not checking any other filed DCTs that may be in close proximity to either AUA borders or elementary AUA sector borders or collapsed AUA sector borders.

5.4.2 IFPS ATS / DCT Segments Checking

5.4.2.1 Details of the segment check

(1) This IFPS check is valid when the ATS route network remains available and when a relevant DCT is within the vertical limits of the co-located ATS route.

(2) If the relevant ATS route segment is closed, then the IFPS raises an error indicating the closure. If that airway is open and the message acknowledged, maintain "DCT" between the two points in the flight plan message output.

(3) Where a flight plan message contains the ATS route designator, if the relevant ATS route segment is restricted by a mandatory DCT RAD unit, then the IFPS raises RAD errors. For this reason, mandatory DCTs should not normally be implemented in the RAD on the same trajectory as an existing closed ATS route segment.

(4) All ATS routes are introduced in CACD as they are published in State AIPs. For NM system purposes only, each unidirectional ATS route segment, which states the opposite non-existing / non-available direction as the Route Designator, is defined as closed.

5.4.2.2 DCT replacement

(1) DCT replacement is an IFPS function that checks whether or not there is a co-located not available route in between two consecutive points filed as POINT DCT POINT. If there is a co-located not available route then IFPS raises an error. If there is a co-located available route then IFPS does not raise an error and the IFPS output maintains DCT in between the two points.

5.5 FRA Flight Planning

5.5.1 Section Specificity

(1) This Section covers the FRA models in CACD and the corresponding flight planning possibilities in IFPS, procedures for checking flight plans horizontally and vertically crossing a FRA area, taking the FRA "balcony effect" into account.

(2) In this Section the FRA significant point relevance as defined by ERNIP Part 1 is used only in supporting figures while in the text it is adapted to reflect the relevant NM system requirements. For example the "system FRA Entry point" coincides with "FRA Horizontal Entry point" for the purpose of "horizontal" FRA entry by crossing the FRA lateral limit or with either "FRA Intermediate point" or "FRA Departure Connecting point" for the purpose of "vertical" FRA entry by crossing the FRA area vertical limit, etc.

5.5.2 Definition of FRA area in NM system (CACD)

(1) In NM system (CACD) the FRA can be defined by the following operational airspaces which might or might not include cross-border airspace ATS delegations:

- RAS.

(2) See Chapter 3.4 FRA DCT Restriction for additional details.

(3) The NM system validates for:

- no overlaps between FRA area definitions in 3D volume and time;
- no gaps in the FRA area border definition.

(4) A FRA Airspace shall be used to define the FRA area when the FRA Concept implementation is based on ATC sectors belonging to an AUA and even on partial ATC sectors.

(5) In short to medium term period the transition from AUA/AUAG to RSA based FRA shall be performed by NM. The FRA area of any new FRA project will be defined as RSA while existing AUA/AUAG FRA Areas will be re-defined as RSA when change is planned in NMOC system by States / FABs / ANSPs. The final goal is for all FRA projects only RSA to be used in NM system as definition of FRA area.

5.5.3 FRA Models and corresponding flight planning possibilities

(1) In CACD, two models of FRA can be implemented with the following common features:

- Flights can proceed from a FRA Entry point to a FRA Exit point;
- Flights can proceed via one or several FRA Intermediate points;
- FRA Intermediate points are optional in a flight plan;
- Flights can use either FRA or the ATS route network, if the ATS route network remains available.

(2) "Full FRA" is a model where:

- As FRA Intermediate points can be used:
  - All published points;
    These are all published points by States in AIPs and properly defined in CACD with their "Significant Point Type". It is not required to define in CACD relevant FRA significant points as Intermediate. IFPS allows in en-route portion of the flight plan only those published points defined in CACD as Significant Point Types "PWP" - Waypoint, "NVA" - Navigation Aid and "COR" - Coord Point. As there is no categorisation in CACD within the point description IFPS allows all these Significant Point Types, including defined FRA (E), FRA (X) and/or FRA (EX), without checking the real usage of the points and points used for terminal/aerodrome purposes to be used in "Full FRA" model.
    Important Note: For further clarification and details see Chapter 2.
  - Unpublished points, defined by geographical coordinates;
- DCT limit in the FRA area is set in CACD to **N/A = Unlimited (UNL)**; meaning that outside the ATS route network the airspace can be crossed on a DCT via whatever FRA Intermediate point.

(3) "FRA with Intermediate points (FRA - IP)" is a model where:

- As FRA Intermediate points can be used only published and properly defined in CACD FRA Intermediate points;
- As FRA Intermediate points cannot be used unpublished points, defined by geographical coordinates;
- DCT limit in the FRA area is set in CACD to **0NM**; meaning that outside the ATS route network the airspace can be crossed on a DCT only from FRA Entry point to a FRA Exit point or via the specifically allowed FRA Intermediate points.

(4) In both models:

- Flight Plan Procedures are applied and segments between FRA Entry, FRA Intermediate and FRA Exit points are to be indicated by DCT in route description

  Example: [Entry Point] DCT [Intermediate point] DCT [Intermediate point] DCT [Exit Point].
- It is possible to make some FRA Intermediate points mandatory, for example flights entering via A and exiting via B shall proceed via C. This shall be done via RAD traffic flow rules.

5.5.4 FRA Vertical Connectivity

5.5.4.1 Definition

(1) The term "vertical connectivity" defined by IFPS shall be understood in the following manner:

- Expresses how to enter or exit FRA area by crossing the FRA area vertical limit;
- Refers to departing and arriving traffic;
- Refers to traffic changing cruising level, only if the change triggers an entry or an exit of the FRA area;
- Does not refer to cruising traffic that remains within the FRA area vertical limits.

(2) The "vertical connectivity" process in IFPS is related to the two following cases:

- FRA co-exists with ATS route network;
- FRA without the ATS route network.

In all cases within the AUA below the FRA area the ATS route network exists and ways of processing are based on DCT limits allowed within that AUA.

5.5.4.2 FRA area with ATS route network

5.5.4.2.1 Departing traffic

(1) For departing traffic there are two possible ways to "vertically" enter the FRA area, by using:

- ATS route network; or
- Relevant SID.

(2) When the ATS route network is used to enter the FRA area there is no requirement to use a FRA Entry point. In the example below (see Figure 42) B is a FRA Intermediate point and C is a FRA Exit point. Flight plan filing tip: The ATS route network is used to the first valid FRA Intermediate point at which the level is higher than the minimum level of the FRA area.

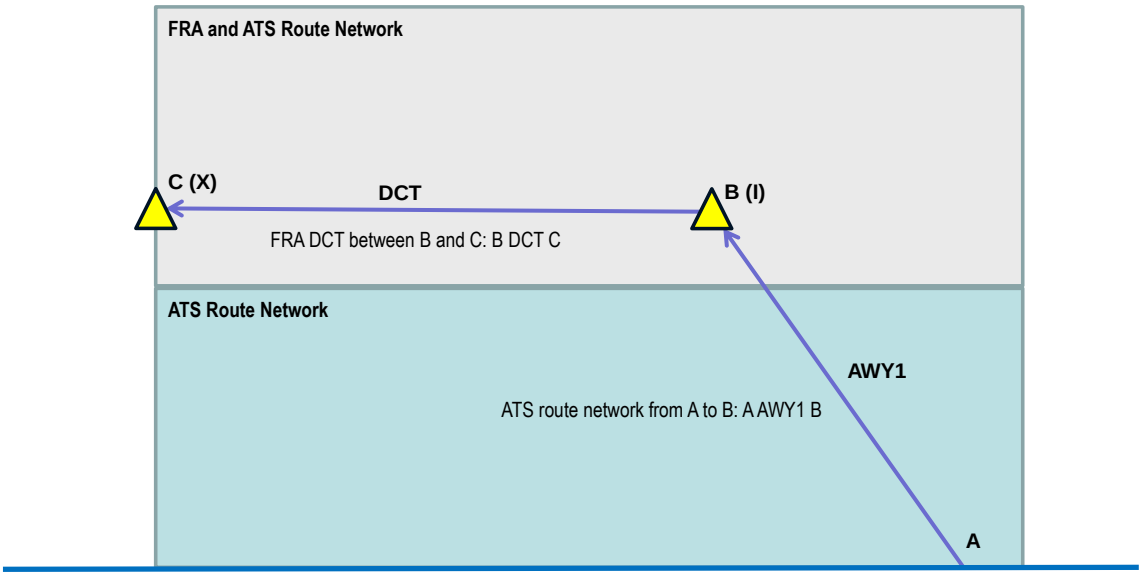


Figure 42: Example trajectory of departing traffic in FRA area with ATS route network entering via airway

(3) As SID is portion of the ATS route network, it can be used to enter the FRA area. The possibility to enter is dependent on the minimum level of the FRA area as well as the maximum level of the SID. In the example below (see Figure 43) these levels overlap allowing airspace connectivity, A is a FRA Departure Connecting point and B is a FRA Exit point.

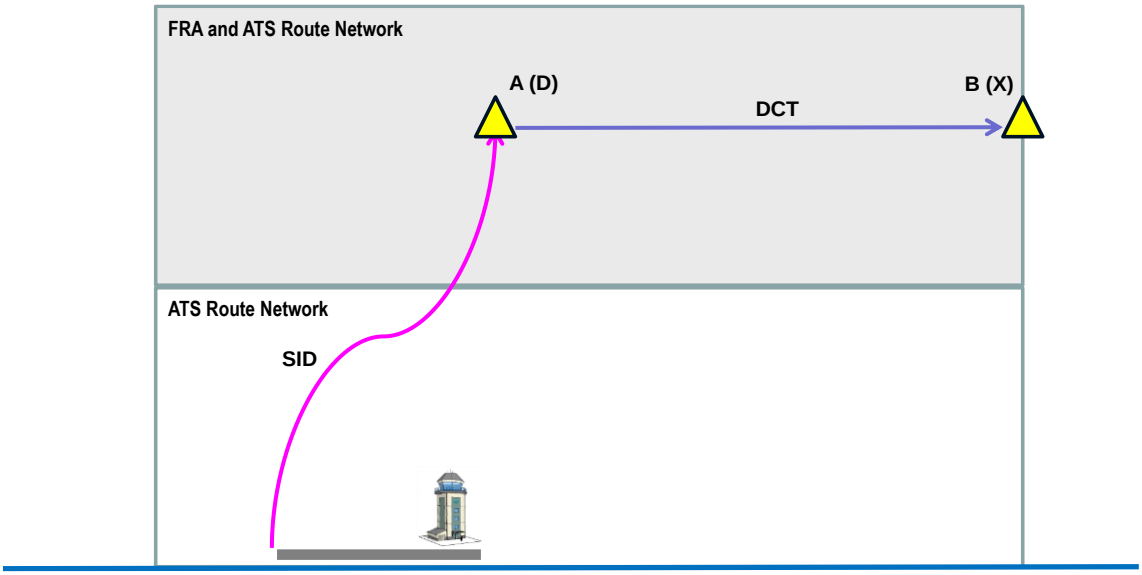


Figure 43: Example trajectory of departing traffic in FRA area with ATS route network entering via SID

5.5.4.2.2 Arriving traffic

(1) For arriving traffic there are two possible ways to "vertically" exit the FRA area, by using:

- ATS route network; or
- Relevant STAR.

(2) When the ATS route network is used to exit the FRA area there is no requirement to use a FRA Exit point. In the example below (see Figure 44) A is a FRA Entry point and B is a FRA Intermediate point. Flight plan filing tip: The ATS route

network is used until a valid FRA Intermediate point at which the level is still higher than the minimum level of the FRA area.

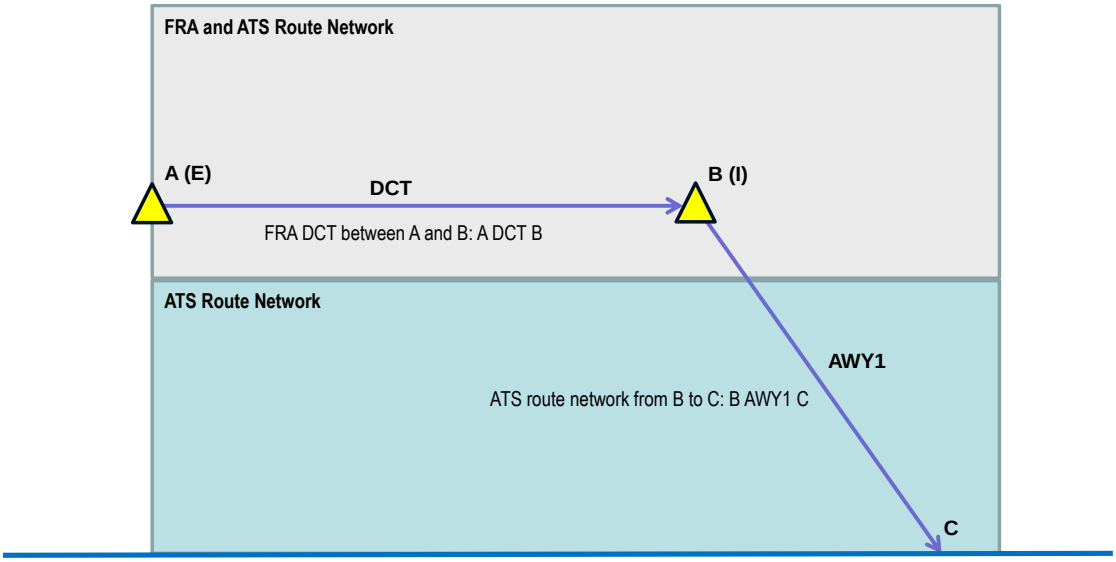


Figure 44: Example trajectory of arriving traffic in FRA with ATS route network exiting via airway

(3) As STAR can be used to exit the FRA area. The possibility to exit is dependent on the minimum level of the FRA area as well as the maximum level of the STAR. In the example below (see Figure 45) these levels are overlapped allowing airspace connectivity, A is a FRA Entry point and B is a FRA Arrival Connecting point.

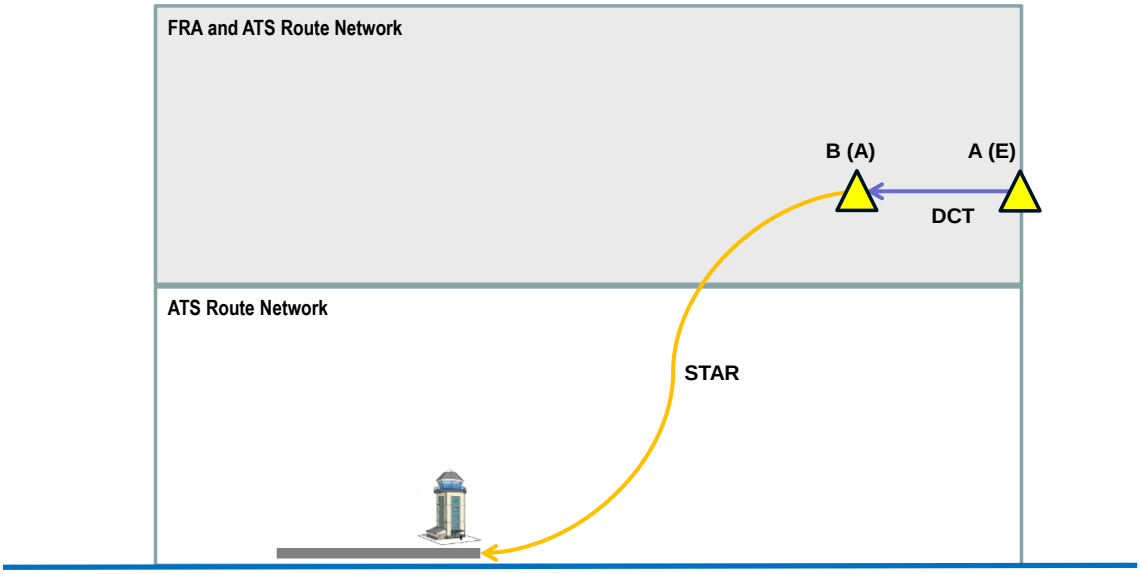


Figure 45: Example trajectory of arriving traffic in FRA with ATS route network existing via STAR

5.5.4.2.3 Overflying traffic (see Figure 46)

(1) For overflying traffic the same principles apply for leaving or joining the FRA following a change of the Requested FL (RFL). The term Requested FL is used for IFPS and RAD purposes and refers to the actual requested cruising level as specified in the route description.

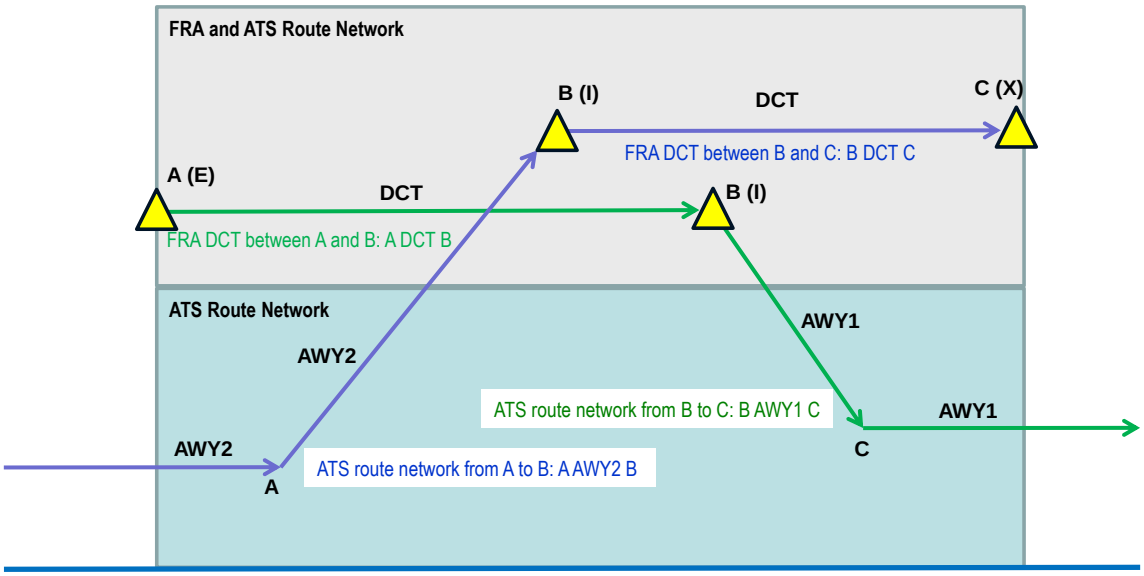


Figure 46: Example trajectory of overflying traffic in FRA area with ATS route network

5.5.4.3 FRA area without ATS route network

(1) The entry to, or exit from, any FRA area depends on the length of "Direct" flight planning option allowed by the States / FABs / ANSPs. This section fully covers the flight plan processing when the FRA area DCT limit is UNL ("Full FRA" model). Provisions for FRA Vertical Connectivity when the FRA area DCT limit is 0NM ("FRA with Intermediate points" model) are also presented in this Chapter.

(2) In Full FRA, there are two possible ways of processing based on DCT limits allowed within the AUA below the FRA area:

- xxxNM; or
- 0NM.

The DCT limit of xxxNM is usually related to the size of the AUA.

5.5.4.3.1 Full FRA: DCT limit xxxNM below the FRA area

a) Departing or Climbing traffic (see Figure 47*)*

When the AUA DCT limit below the FRA area is for example 300NM, option B DCT C is accepted by IFPS despite the fact that the level at the first point of the DCT (B) is below the FRA minimum level. Point B is inside an AUA where the DCT limit is 300NM and as long as B DCT C is <300NM, it is accepted by IFPS. This means that B DCT C could enter the FRA area from below, if the allowed AUA DCT limit permits. If the FRA area has an entry "from below" restriction then point B needs to be defined as FRA Entry point in relevant FRA DCT restriction.

The option to enter the FRA area via a SID is also available when the FRA minimum level and SID maximum level overlap, allowing airspace connectivity. If there is no level overlapping, the ATS route network is used to enter the FRA area.

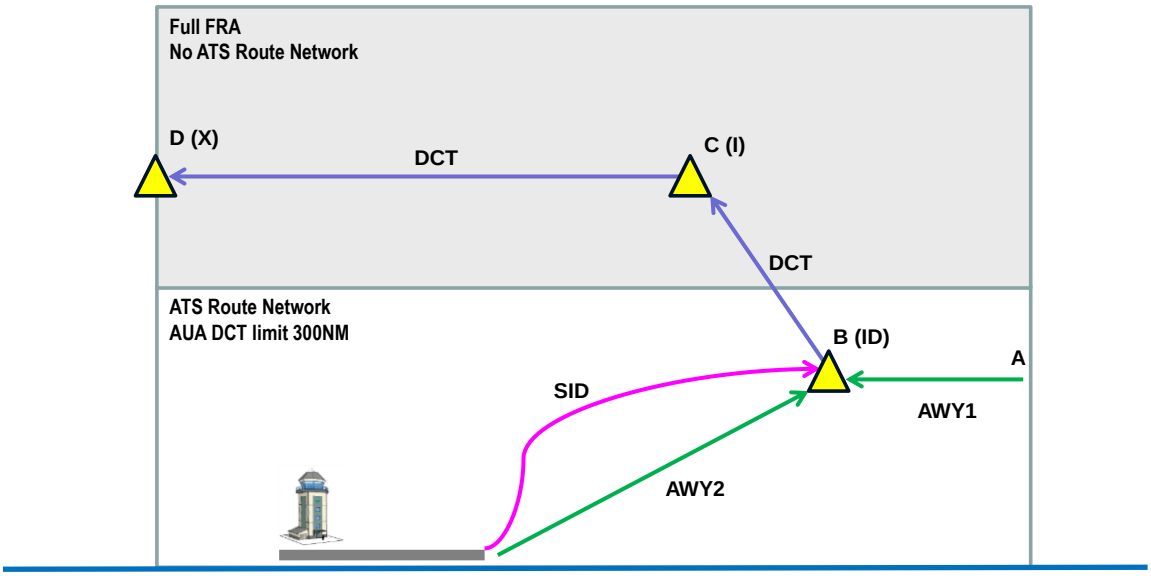


Figure 47: Example trajectory of departing and overflying traffic in FRA area without ATS route network with AUA DCT xxxNM

b) Arriving or Descending traffic

When the AUA DCT limit below the FRA area is for example 300NM, option C DCT B is accepted by IFPS despite the fact that the level at the last point of the DCT (B) is below the FRA minimum level. Point B is inside an AUA where the DCT limit is 300NM and as long as C DCT B is <300NM, it is accepted by IFPS. This means that C DCT B could leave the FRA area from above, if the allowed AUA DCT limit permits. If the FRA area has an entry "from above" restriction then point B needs to be defined as FRA Exit point in relevant FRA DCT restriction.

The option to exit the FRA area via a STAR is also available when the FRA minimum level and STAR maximum level overlap allowing airspace connectivity. If there is no level overlapping the ATS route network is used to exit the FRA area.

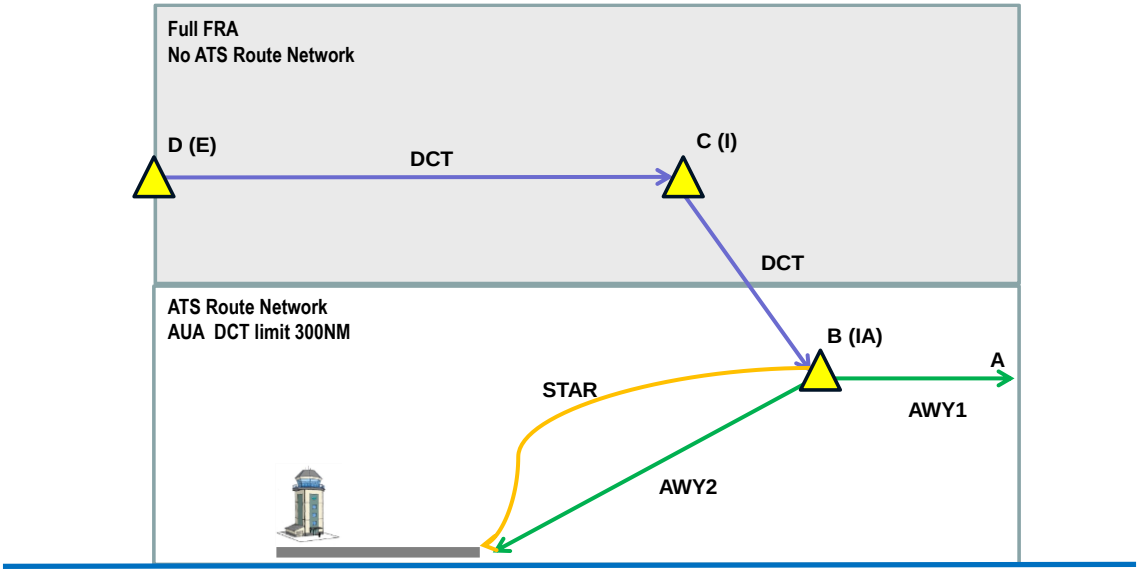


Figure 48: Example trajectory of arriving and overflying traffic in FRA area without ATS route network with AUA DCT xxxNM

5.5.4.3.2 Full FRA and FRA - IP: DCT limits 0NM below the FRA area

(1) For flight planning purposes, some FRA significant points can be defined as "vertical" Exit or Entry points out of the AUA to facilitate the vertical connectivity. This can be done by "vertically" expanding the lower vertical limit of required points.

a) Departing or Climbing traffic (see Figure 49*)*

The first point of the DCT going to FRA area shall be a FRA Intermediate point as published in State AIP but defined in CACD by relevant FRA DCT restriction as "system FRA Entry point" and shall pass through level band FLxxx - FLyyy. Option A DCT B or A DCT C is accepted by IFPS despite the fact that the level at A is below the FRA minimum level. It overrides the AUA DCT limit below FLyyy which is 0NM.

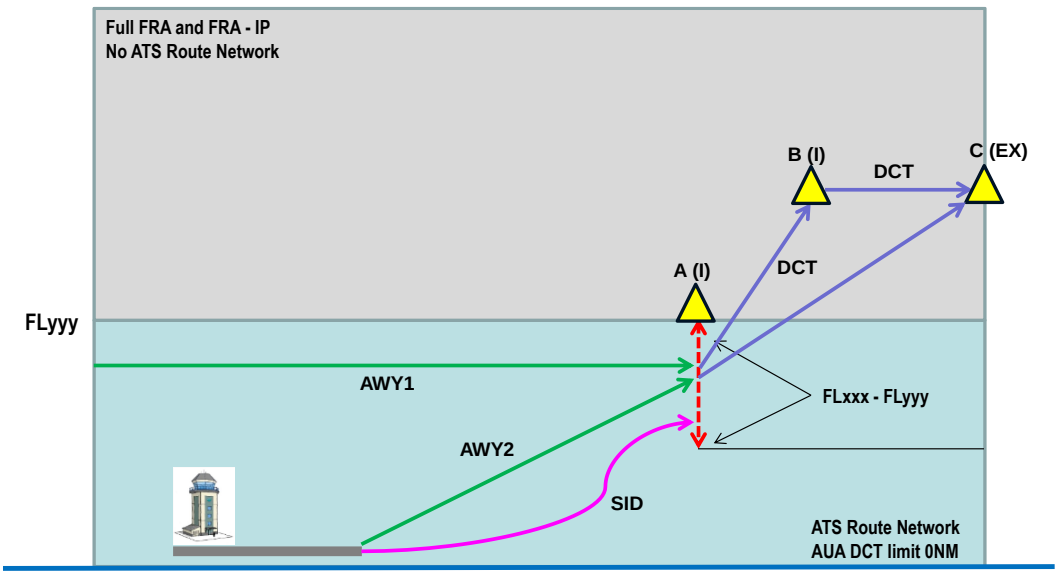


Figure 49: Example of trajectory of departing and overflying traffic in FRA without ATS route network with AUA DCT 0NM

b) Arriving or Descending traffic (see Figure 50*)*

The last point of the DCT coming from FRA area shall be a FRA Intermediate point as published in State AIP but defined in CACD by relevant FRA DCT restriction as "system FRA Exit point" and shall pass through level band FLxxx - FLyyy. Option B DCT A or C DCT A is accepted by IFPS despite the fact that the level at A is below the FRA minimum level. It overrides the AUA DCT limit below FLyyy which is 0NM.

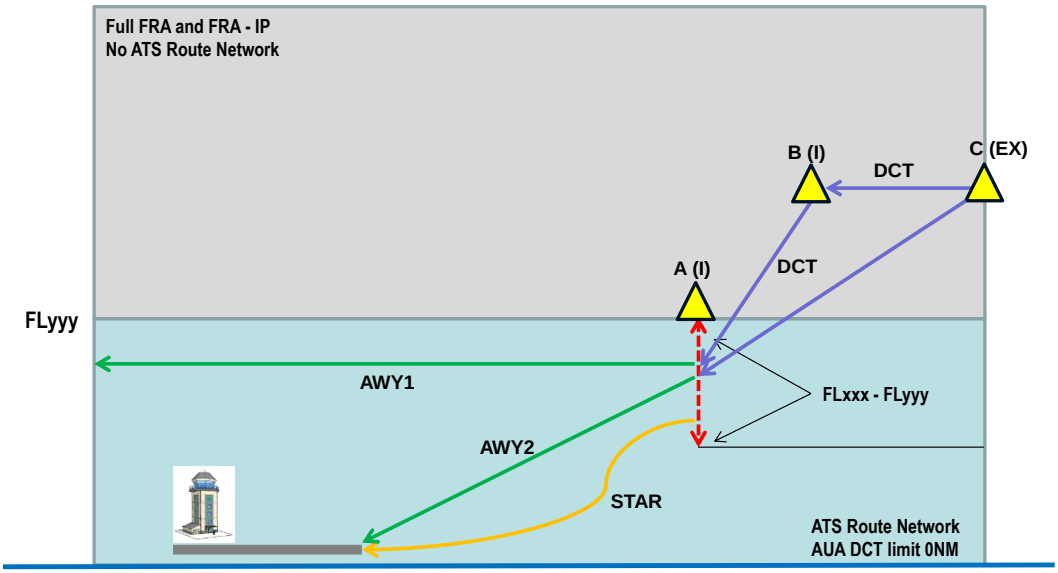


Figure 50: Example trajectory of arriving and overflying traffic in FRA without ATS route network with AUA DCT 0NM

Whenever a FRA Intermediate point ("system FRA Entry or Exit or Entry / Exit point") is used to enter or exit the FRA outside the level band FLxxx - FLyyy, IFPS reports two errors, for example:

- ROUTE165: stating that the DCT is too long for relevant AUA. This is the normal AUA DCT checking with DCT limit 0NM below FLxxx;
- ROUTE29: stating that it is forbidden to cross the border between relevant AUA. IFPS gives an indication that the point is not an "all allowed" FRA Entry or Exit at the calculated level, which means the point is allowed a "some levels".

(2) IFPS Distance checking in FRA: distance FRA Entry or Exit point to FRA area border

5.5.4.4 Details of the distance check

(1) There is a maximum allowed distance that an aircraft can fly between a FRA Entry / Exit point and a border of an FRA area. This maximum allowed distance is different for every FRA Entry / Exit point and associated FRA area border and is independent from flight plan trajectories. It is calculated by solely taking the location of the FRA area Entry / Exit point and the location and shape of the AUA into consideration.

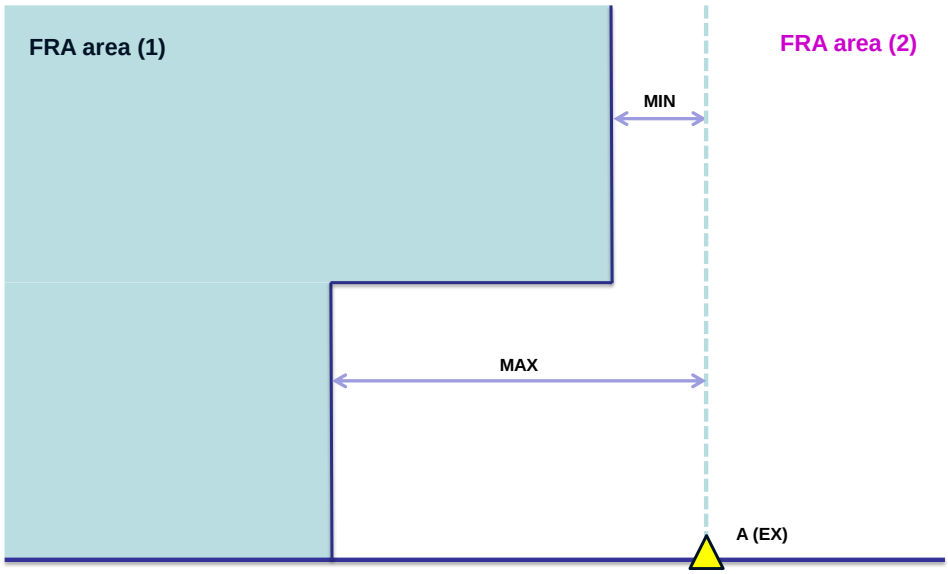


Figure 51: Example of how the maximum allowed distance is calculated.

(2) If the difference between MIN and MAX is higher than 50NM, then the allowed distance to fly between FRA significant point and FRA area border will be:

((MIN + 50) * 2 + 5) NM

(3) If the difference between MIN and MAX is lower than 50NM, then the allowed distance to fly between FRA significant point and FRA area border will be:

(MAX * 2 + 5) NM

(4) The MIN and MAX are the smallest distances between FRA significant point and FRA area border in all directions for a given level.

(5) Graphical explanation is given in Figure 52 below.

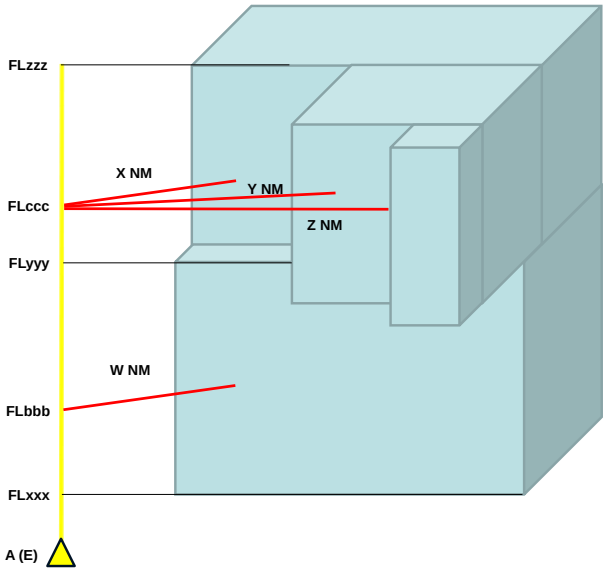


Figure 52: Example of how the maximum allowed distance is calculated

5.5.4.5 Reason for the distance check

(1) This is to ensure that flight enters and/or exits FRA area on a trajectory that States / FABs / ANSPs expect (see Figure 53).

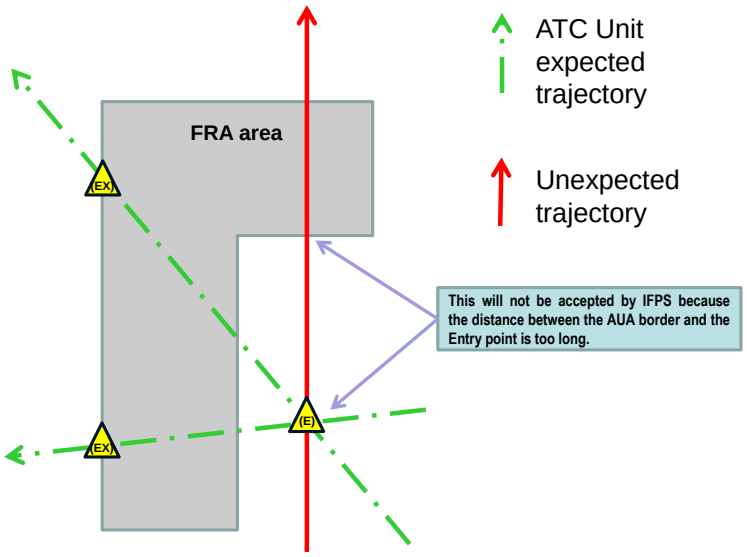


Figure 53: Example of the reason of the distance check

5.5.4.6 FRA area border shape and consequences on the check

5.5.4.6.1 FRA area vertical border - straight "wall"

(1) In the case of an FRA area having a straight vertical border (wall) the minimum distance between a FRA Entry / Exit point and the border is constant at all levels.

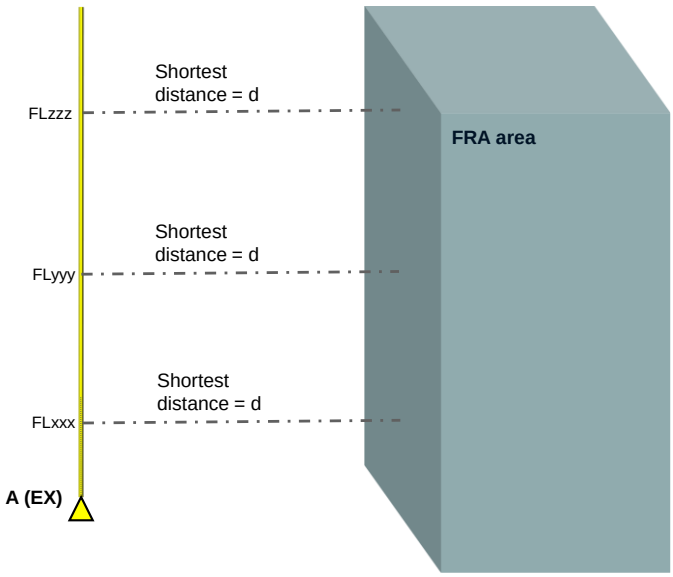


Figure 54: Example of constant distance at all levels between FRA area with straight vertical border (wall) and FRA (EX)

(2) The difference between MIN and MAX is Zero. The maximum allowed distance to fly between FRA point and FRA area border is:

(MAX * 2) + 5 NM

Vertical View (from the top)

In the example below (see Figure 55) the flight is going eastbound via point A which is the FRA Entry point for FRA area (2) but outside of it. Segment A DCT B is accepted by IFPS as measured distance to the FRA area border is within the maximum allowed limit. Segment A DCT C is not accepted by IFPS as measured distance to the FRA area border is above the maximum allowed limit.

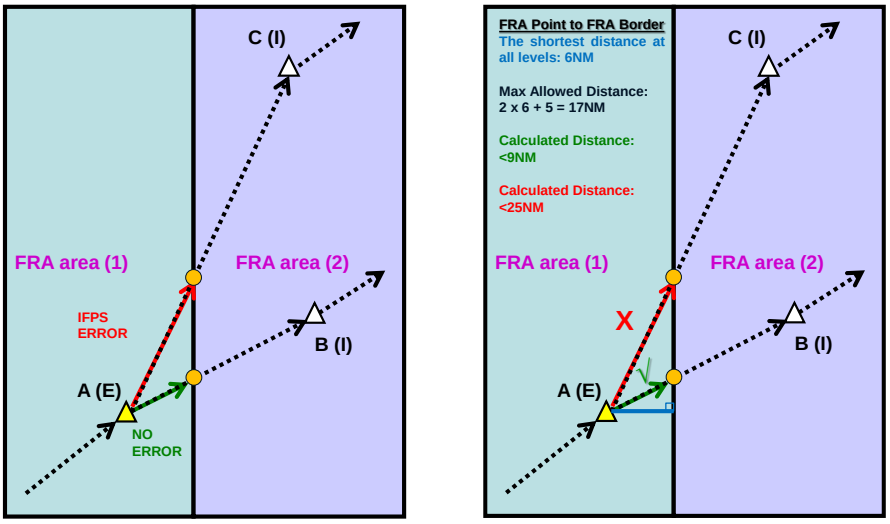


Figure 55: Example of calculations for correct and incorrect trajectory of entering traffic in FRA area

5.5.4.6.2 AUA FRA area vertical border - not straight "wall"

(1) The "balcony effect" is triggered by the same check and is linked to delegated airspace.

(2) What is the maximum of the shortest distance from the FRA Entry / Exit point to the AUA FRA area border taken over all levels where a shortest distance exists (i.e. over all levels where the FRA airspace exists)? In the example below (see Figure 56) where the AUA FRA area passes the vertical of the FRA Entry / Exit, the shortest distance is 0NM. In the FLs where there is a delegated airspace from AUA2 (above FL285) the shortest distance is 110NM. The difference between MIN and MAX is larger than 50NM, then the formula that is applied is:

(MIN + 50NM) * 2 + 5NM = 105NM

Horizontal View (view from the side)

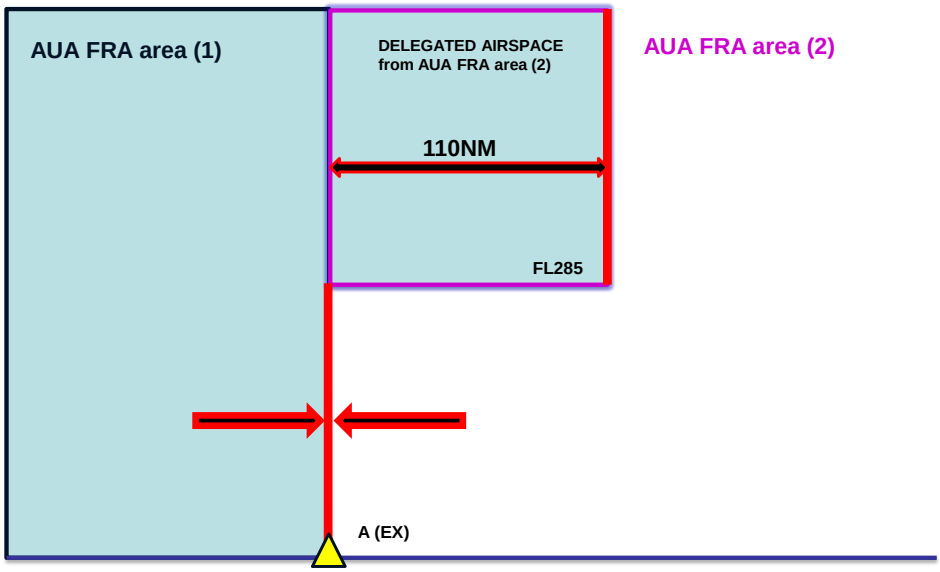


Figure 56: Example of FRA "balcony effect" in AUA FRA aresa with delegated airspace

(3) The distance not to exceed, whilst flying between the FRA Entry / Exit point and the AUA FRA area vertical border (wall), is 105NM. Any crossing of the vertical

border (wall) of the AUA FRA area beyond the 105NM will trigger an error in IFPS as the FRA Entry / Exit point is not validated as a **valid** FRA Entry / Exit point (see Figure 57).

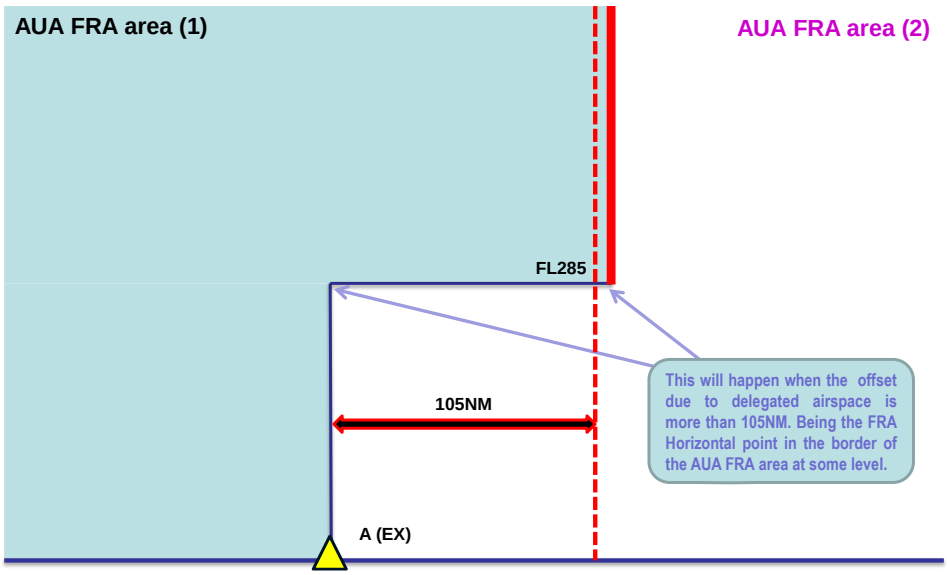


Figure 57: Example of calculations of FRA "balcony effect" in AUA FRA areas with delegated airspace

(4) The check applies only for the crossing of the AUA FRA area vertical border (wall). Any trajectory crossing the AUA FRA area horizontal border (floor) is not subject to this check. This is presented in the example below (see Figure 58).

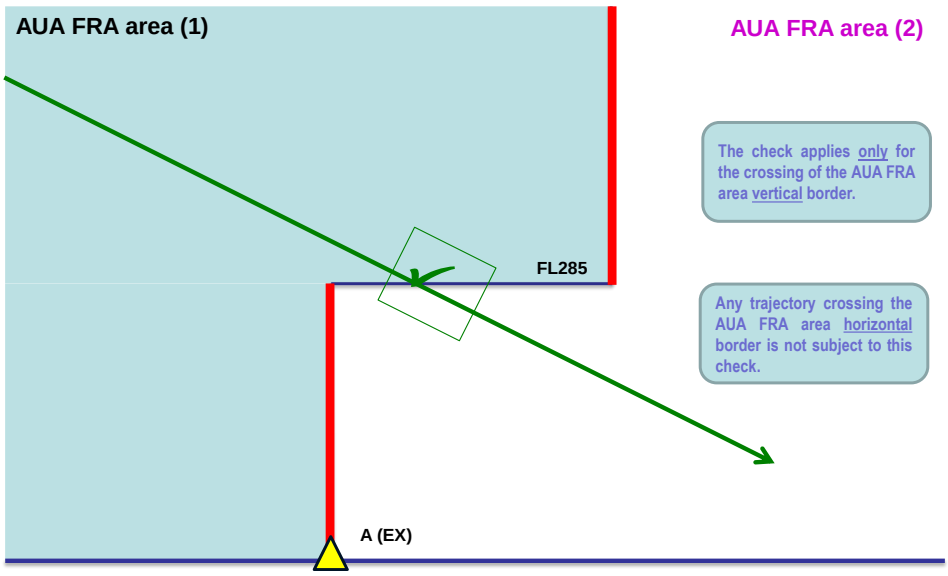


Figure 58: Example of calculations of FRA "balcony effect" in AUA FRA areas with delegated airspace

5.5.4.6.3 IFPS errors and Procedure

(1) IFPS will raise an error whenever the distance between the FRA (EX) point and the FRA area border is greater than the limit, IFPS will:

- Not validate the FRA (EX) point despite the point being used in its correct role;
- Look for a valid point:
  - For entry: previous point "en-route";
  - For exit: next point "en-route".

The examples below represent this.

(2) The flight plan route is A DCT B DCT C via FRA Intermediate point followed by a FRA Entry / Exit point followed by a FRA Intermediate point. Because of the check IFPS does not validate B as an allowed FRA exit and entry point. IFPS will invalidate the flight plan and report 2 errors (on the previous point "en-route"):

- ROUTE29 stating that point A is not an allowed entry point;
- ROUTE29 stating that point A is not an allowed exit point.

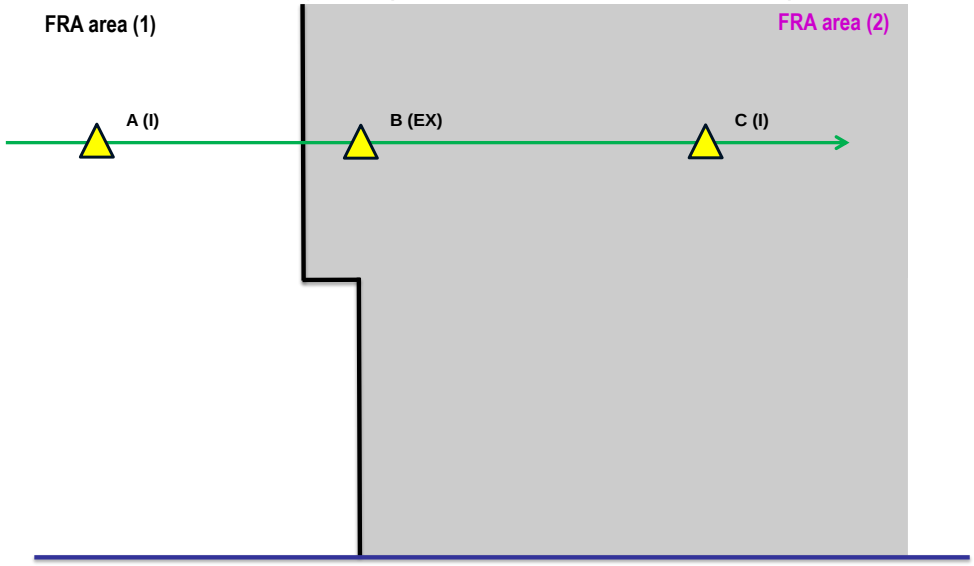


Figure 59: Example of FRA "balcony effect" in FRA areas with delegated airspace and FRA points position

(3) The flight plan route is A DCT B DCT C via FRA Intermediate point followed by a FRA Entry / Exit point followed by a FRA Intermediate point. Because of the check IFPS does not validate B as an allowed FRA exit and entry point. IFPS will invalidate the flight plan and report 2 errors (on the next point "en-route"):

- ROUTE29 stating that point C is not an allowed entry point;
- ROUTE29 stating that point C is not an allowed exit point.

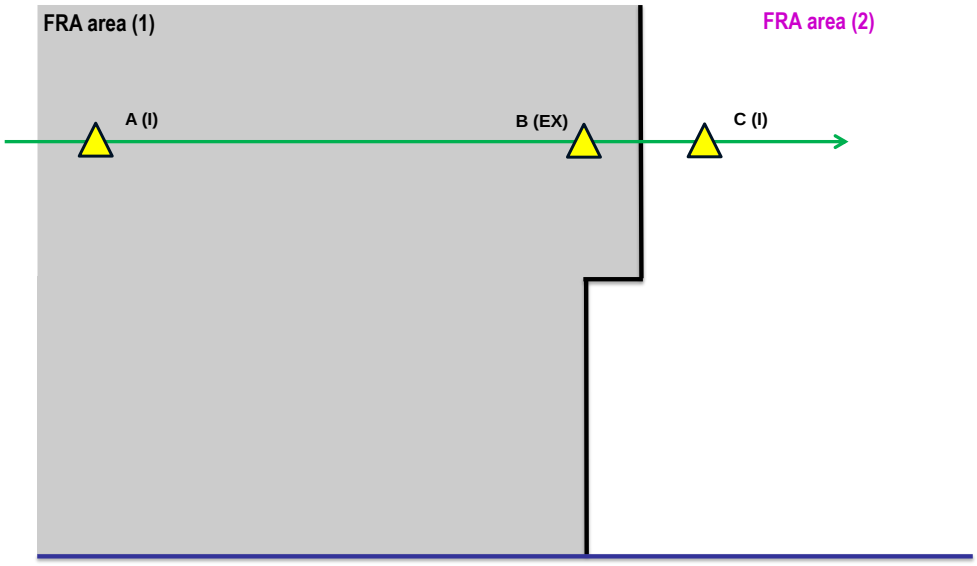


Figure 60: Example of FRA "balcony effect" in FRA areas with delegated airspace and FRA points position

(4) If requested by States / FABs / ANSPs, when an error is raised, pertaining to a vertical error ("balcony" effect), it may be manually ignored by FP staff and the flight plan will be accepted.

5.5.4.7 Solution / Recommendation

(1) A significant point can be published as FRA Entry or FRA Exit point far from the FRA area border. Also, the FRA area vertical borders (wall)can be not straight. But it shall be considered that the "farther" FRA Entry or FRA Exit point and FRA area border are and the more irregular the vertical borders (wall) of the FRA area are, the more chances to have flights entering FRA area through unexpected points.

(2) If the delegation "sticks out" by more than 105NM, then the "wall" that doesn't stick out will become unreachable from the FRA Entry point at this level, even when the flight takes the shortest route to the FRA area boundary. Such problems can be avoided by delegating this airspace at all levels, even if there is not a significant amount of traffic to be delegated at these levels. The simplicity of the airspace geometry will simplify flight planning.

(3) In order to avoid the undesired rejection of flight plans States / FABs / ANSPs may consider the following:

- For point A - this point should be published as a FRA Entry / Exit point below FL285;
- For point B - this point should be published as a FRA Entry / Exit point above FL285.

(4) Flights crossing the horizontal border (floor) can use either point.

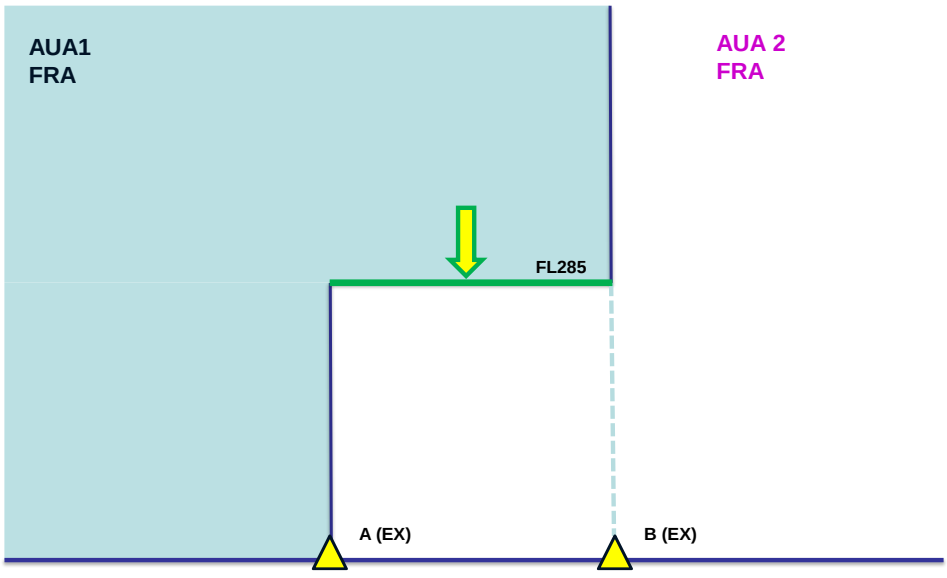


Figure 61: Example of FRA "balcony effect" in AUA FRA areas with delegated airspace and FRA points positions

5.6 FF-ICE

5.6.1 Introduction

(1) FF-ICE stands for Flight & Flow Information for a Collaborative Environment. It is a concept to support future ATM Operations. The FF-ICE concept is ICAO-driven and is therefore applicable world-wide.

(2) FF-ICE is guided by the requirement to eliminate or reduce the limitations of the present flight plan and to accommodate the future environment detailed in the Global Air Traffic Management Operational Concept (ICAO Doc 9854).

(3) The NM implementation of FF-ICE is within an environment compatible with the guidance in ICAO Doc. 10039, Manual of System Wide Information Environment; more specifically making use of the NM B2B Services.

(4) The format used for the exchange of FF-ICE information is the Flight Information Exchange Model (FIXM). It relies on the FIXM core and FIXM extensions (for more details see NM B2B Reference Manual).

(5) This Chapter reflects relevant elements of the NM FF-ICE/R1 implementation through the NM B2B Services. For additional details see IFPS Users Manual or related technical documentation.

(6) FF-ICE brings an additional format for the exchange of flight data (i.e. FIXM). The other formats used/handled by the IFPS are ICAO FPL2012 (ICAO Doc. 4444), ADEXP (ATS Data Exchange Presentation) and NM B2B format.

(7) Within this document, the term 'flight plan' encompasses three formats (unless specified otherwise) in the following way:

- FPL indicates ICAO FPL2012 format.
- IFPL indicates ADEXP format.
- eFPL indicates FIXM format.

(8) In most cases the checks performed by the IFPS on incoming messages, the system processing and the procedures to be applied for manual correction by FP staff are the same regardless of the message format. Some errors are specific to eFPLs and clearly identifiable as such (for more details see IFPS Users Manual).

(9) The FF-ICE Services supported by NM are the following:

- Trial Service - initiated through the submission of a Trial Request and enables users to:
  - Evaluate an eFPL before submission
  - Evaluate an alternative to an existing filed eFPL
  - Perform 'what-if' type of investigations
- Filing Service - enables users to:
  - File an eFPL
  - Update an eFPL
  - Cancel an eFPL
- Flight Data Request Service - enables users to:
  - Request a copy of the eFPL as accepted
  - Request a copy of the supplementary flight plan data
  - Request a copy of the latest Filing status for the flight (i.e. ACCEPTABLE/NOT ACCEPTABLE)

- Request the Submission Response status (e.g. should the previous Submission Response be MANUAL).

- Notification Service - users to pass departure and arrival information to the NM. It replicates for eFPLs the FPL function of the DEP and ARR messages.

(10) FF-ICE Re-evaluation - a process that NM performs to determine whether a flight plan remains in compliance with published restrictions or ATM measures that may have been applied or modified since the flight plan was last evaluated. The IFPS ensures the re-evaluation of eFPLs in the same way that it revalidates FPLs/IFPLs. Therefore, all valid flight plans (eFPL, FPL, IFPL) are subject to the IFPS flight plan revalidation under the same process, same criteria and same possible outcome. To be aware of re-evaluation results, clients shall make use of the NM B2B Publish/Subscribe services that will provide updates to the eFPL's filing status. Subscription to this service has no influence on the output of the Flight Plan Revalidation process: an eFPL that fails a re-evaluation (a revalidation in IFPS terms) shall also receive either an FLS or a REVAL ADVISORY message. For an eFPL with the Filing Status NOT_ACCEPTABLE due to re-evaluation, NM provides a valid route proposal as a Negotiating trajectory (containing a route expressed as an ordered list of route elements) if one can be found and the corresponding errors.

(11) eFPL Distribution - To be provided with eFPLs, an eATCU shall make use of the NM B2B Publish/Subscribe service. In addition, the IFPS continues to distribute flight plan data via AFTN to that receiving unit.

In this context, an eATCU is an Air Traffic Control Unit capable of consuming eFPLs and is inside the IFPZ.

- eATCU receiving flight data via AFTN - The format of distribution (either ICAO FPL2012 or ADEXP) is consistent with the settings stored in the NM CACD. This indicates that IFPS can translate an eFPL into an FPL or IFPL, an FPL into an IFPL (and vice-versa).
- eATCU receiving flight data via NM B2B - eFPLs are by nature in FIXM format and therefore compatible with NM B2B. FPLs and IFPLs are converted into FIXM to be compatible with NM B2B. It ensures that an eATCU receives all the flight data via B2B and not only eFPLs.

(12) Translation - a process by which an ATS message (i.e. ICAO FPL2012 or ADEXP format) is constructed from an FF-ICE message (i.e. FIXM format). It is essentially based on mapping of data.

Delivery - a process of distribution of a translated message to units requested in then FF-ICE message that are not FF-ICE capable.

An eFPL submitter has the option to define recipients for whom translation and delivery is needed but would not normally be addressed by the IFPS.

The translation & delivery function is not always equivalent to the re-addressing function.

5.6.2 eFPL Composition and processing

(1) With the exception of the data structure and format, the main differences between eFPL and FPL/IFPL are the provision of the:

- Globally Unique Flight Identifier → mandatory
- Aircraft Operator Flight Plan version → mandatory

- Route/Trajectory with or without specific aircraft performance → route is mandatory, trajectory and performance data are optional

(2) An eFPL shall contain the minimum mandatory required data.

(3) When filing an eFPL with the IFPS, the route description may be expressed as:

- A **route text** (equivalent to FPL Item 15c). Route text is to be used only for mixed IFR/VFR and GAT/OAT flights that contain within the route free text location names, such as city, road or river names.
- **A route** (equivalent to FPL Item 15 as well as the departure and destination aerodromes). It is represented as an ordered list of Route Trajectory Elements. Each Route Trajectory Element corresponds to a significant point that would be present in an FPL Field 15c. The Route Trajectory Elements are sequenced in the order in which they will be flown from departure to destination. Additional optional data items (for example a planned delay) may be provided for each Route Trajectory Element.
- **A trajectory** (contains Route Trajectory elements and additional data providing more granularity). A trajectory. In a trajectory, each ATS route of a route, as defined above, is expanded into its constituent significant points, explicitly indicating each published point along that ATS route, as a new Route Trajectory Element. Each Route Trajectory Element of the resulting expanded Route is supplemented with a four-dimensional point as well as other optional data items (for example Trajectory Point Property). Additional trajectory points that correspond to a predefined list of Trajectory Point Properties shall also be added in between points in the expanded route, as new Route Trajectory Elements, to reflect the expected location of the flight more precisely.

NOTE: It is recommended to provide a trajectory when filing an eFPL to take full advantage of the expected benefit for ATM. Filing a route text or structured route is recommended to be used only for certain types of operations (OAT, VFR).

(4) When the trajectory is provided in an eFPL, the IFPS shall perform checks such as syntax, semantic and the overall coherence of the submitted data in order to calculate a profile for that flight plan.

(5) If the submitted trajectory passes these checks, then it is used by the IFPS when calculating a profile for that flight. In that case, any translated FPL or IFPL contains 'AO4DT' in the remark field.

(6) Therefore, when AO4DT is present in an FPL/IFPL, this means that the source was an eFPL with a trajectory and that IFPS used the trajectory for the profile calculation.

(7) If the submitted trajectory does not pass these checks, then it is discarded and the IFPS shall calculate a profile for that flight based on the route elements.

(8) The IFPS may introduce some differences in the profile when compared to the trajectory. Such differences may be caused when airspace users use a different set of airspace data when compared to NM (e.g. flight level constraints such as SID/STAR or PTRs).

Example: The figure below shows the trajectory (blue line) joining the 4D points (blue points marked with a cross) provided and used by the IFPS. While the IFPS profile (black line joining the black dots) is similar for the climb and cruise

phases, it is different for the descent phase because of constraints (PTRs, in orange).

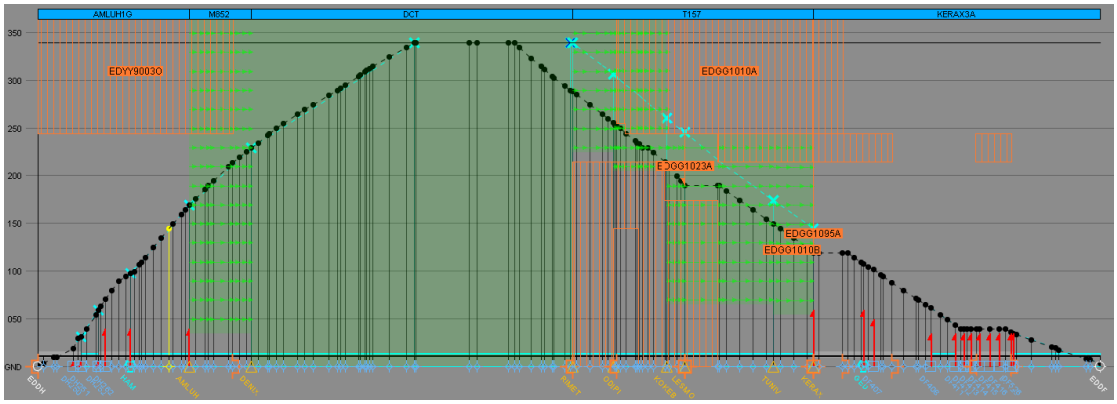


Figure 62: IFPS profile with trajectory elements

(9) The trajectory requirements that are the basis for the calculation of the trajectory of a flight are:

- Minimum vertical changes - The minimum vertical changes information required in a trajectory (point4D)
  - One Top of Climb (TOC) point for the initial cruising level and every subsequent requested cruising level change after a climb. There will be one top-of-climb for each cruising level (step climbs). Trajectory points at the end of each climb that is followed by a cruise shall be marked as a TOC. Each cruising level indicated in the route for a climb shall have an associated TOC within the trajectory;
  - One Top of Descent (TOD) point where the trajectory begins a descent from the final cruising level. The trajectory point where the descent for arrival from the final (last) cruising level starts shall be marked as a TOD;
  - Trajectory Change Point – Vertical (TCP-V) points where a level segment (intermediate or cruise) is initiated or terminated. Except for the first and the last trajectory points, any points that are either the beginning or the end of a climb, or a descent, and are not a TOC or TOD as described above, shall be marked as a TCP-V;

    NOTE: For each trajectory point (point4D): level, time, position and Along Route Distance (ARD).

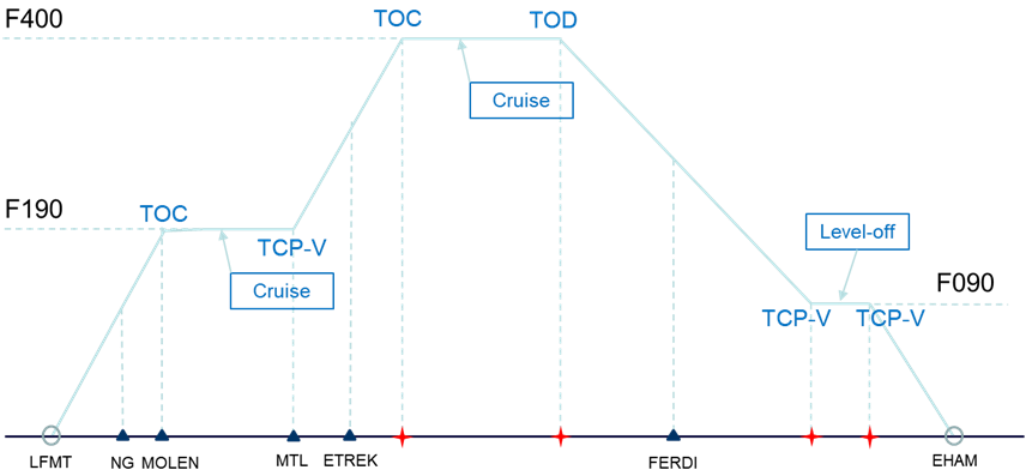


Figure 63: Vertical profile with 4D elements

- Initial and end prediction point - The first point in the trajectory elements list shall be the departure aerodrome reference location. The last point in the trajectory elements list shall be the destination aerodrome reference location.

- Time information and taxi time - The time for the first 4D point in the trajectory elements list shall be expressed as an absolute time. The time for the rest of the elements in the list shall be provided as relative time information. The times associated with the first and the last points in the trajectory represent respectively the Take-Off Time (TOT) and touchdown time. It should be noted that in an eFPL the taxi time is not an individual data element as it is calculated from the difference between the EOBT and the ETOT. The maximum value for the calculated time is 90 minutes. The IFPS shall only accept a calculated taxi time with value 0 (zero) for military flights or flights operated by a helicopter.

(10) Requested cruising levels - To ensure backwards compatibility with the existing ICAO FPL2012 during the transition period and to avoid disrupting flight plan filing to ANSPs, eFPL submitters shall continue to file requested cruising levels as per ICAO Doc 4444.

FF-ICE introduces the means to indicate whether a change to a requested cruising level is planned to commence or planned to be attained at the associated point, however, this information should not be provided to the IFPS and will be discarded by the IFPS if it is provided. Therefore, changes of requested cruising levels in an eFPL are equivalent to changes in an ICAO FPL2012.

A change of requested cruising level that is not expected to start at a published point shall be indicated either (figure below):

- At the previous published point (A) compared to the trajectory point where the climb/descent is expected to start (B), or
- At the next published point (C) compared to the trajectory point where the climb/descent is expected to start (B), provided the next published point (C) is before the trajectory point where the climb/descent is expected to end (D).

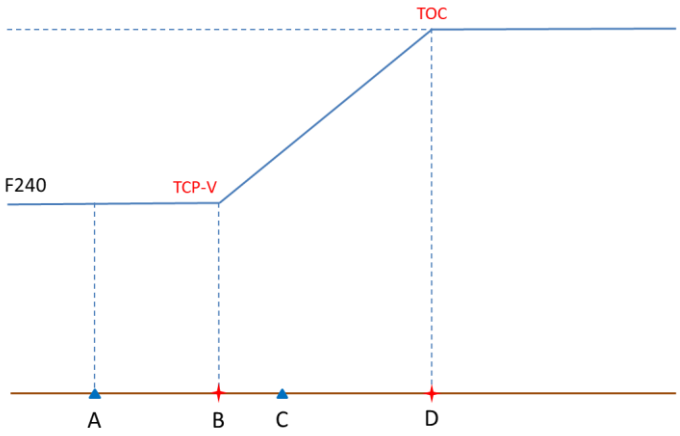


Figure 64: Change of requested cruising levels not starting at a published point

Changes to cruising levels that are required to comply with a restriction (RAD, closed CDR) shall continue to be included as requested cruising level within the eFPL route information as per the ICAO FPL2012.

(11) The Globally Unique Flight Identifier (GUFI) - is a Universally Unique IDentifier (UUID) that guarantees uniqueness across space and time. It shall be unique to a flight. In this context 'a flight' is defined as a single leg and is disconnected from the aircraft identification.

The purpose of the GUFI is to provide a unique reference that is used to unambiguously associate any subsequent flight data transaction (e.g. update, cancellation, delay) to the correct flight. The provision of the GUFI is mandatory when using the filing service and the notification service.

The IFPS shall check the uniqueness of the GUFI. If an identical GUFI is detected to be used by more than one flight, then the submission shall be invalidated.

In the translation & delivery process and in the IFPS flight data distribution, the GUFI shall not appear in the FPL or IFPL when the source is an eFPL.

The GUFI may be used for retrieving an eFPL.

The GUFI and Aircraft Identification, Departure Aerodrome and Destination Aerodrome information in a message received is cross-checked upon reception of an eFPL associated message (Update, Cancel or Notification). If the GUFI and the eFPL associated message information do not match, an error is raised (at the level of B2B).

(12) Operator Flight Plan Version - is an element that is mandatory when submitting eFPLs and any subsequent updates. It is an information element that provides a reference to a particular flight plan version and an indication of the sequence in which versions have been created.

The version number would allow ATC and the crew to verify that they are using the same version of a flight plan.

Each eFPL update shall contain a version number that increments by 1 the version number of the existing flight plan. Failure to comply with this requirement results in the IFPS invalidating the submission.

In the translation & delivery process and in the IFPS flight data distribution, the Operator Flight Plan Version is not included shall not appear in the FPL or IFPL when the source is an eFPL. However, the Operator Flight Plan version is included in eFPLs distributed to eATSUs.

(13) En-Route Delay - The en-route delay in an eFPL is equivalent to the existing DLE and/or STAY for FPL. The IFPS supports the provision of en-route delay at a point or along a route segment. Other en-route delay types foreseen for FF-ICE such as planned airborne holding, operations within an airspace are not yet supported. If the flight has an en-route delay then the submitter shall provide the route as an ordered list of route elements (structured route) and shall not provide a trajectory. To indicate:

- En-route delay at a point in an eFPL the submitter shall include within the route elements the point where the en-route delay commences, indicating the delay value and the delay reason together with the en-route delay type.
- En-route delay along a route segment in an eFPL the submitter shall include that delay within the route elements where the en-route delay commences, indicating the delay value and the delay reason, together with the en-route delay type.

There are 2 main rules that the IFPS uses for the translation of en-route delays:

- Rule 1: For eFPLs with both departure and arrival aerodromes inside the IFPZ then the en-route delay (whether at a point or on a segment) shall be translated into a STAY indicator,
- Rule 2: For eFPLs with either the departure or arrival aerodrome outside the IFPZ then the en-route delay shall be translated into a DLE indicator, as follows:
    - For en-route delay at a point, the DLE/ indicator shall be included in item 18 corresponding to the en-route delay information
    - For en-route delay along a segment, the DLE/ indicator shall be included in the item 18 corresponding to the en-route delay information, and 'DCT' in item 15 between the start and end point of the segment.

For a flight that has OAT portion(s), the route shall be provided as a route text (equivalent to ICAO FPL Item 15c). Additionally, if the flight is leaving the IFPZ, indicating an en-route delay is only possible by using DLE.

The en-route delay shall be indicated within the remarks attribute of the Flight data element of FIXM as follows: DLE/… (i.e. in the ICAO FPL2012 format).

(14) Departure and Arrival Airport slot - To indicate a departure and/or an arrival airport slot identification in an eFPL, the submitter shall make use of the airport slot identification item. The information may be provided either in an eFPL or an eFPL update.

5.7 iOAT Flight Planning

(1) The improved Operational Air Traffic (OAT) flight plan, hereinafter referred to as the iOAT FPL is a new developed kind of flight plan based on the ICAO 2012 flight plan format to facilitate military IFR operations in controlled airspace of IFPZ.

(2) The iOAT flight plan facilitates integration of military IFR operations under the conditions specified by EUROCONTROL Member States when flying as OAT and to harmonise flight planning procedures for OAT IFR flights in Europe. The usage of iOAT flight plan is currently limited to the iOAT airspace (see more details in the IFPS User's Manual). Gradual expansion is foreseen where states may decide whether to use it locally and/or for cross-border operations. It will be geographically limited to the IFPZ.

(3) An efficient civil military collaboration requires harmonisation. This is supported by the EUROCONTROL Publication for harmonised Rules for OAT under IFR inside controlled Airspace of the ECAC Area (EUROAT).

(4) Any flight or portion thereof operating under iOAT is processed by the IFPS in the same way as flights operating under IFR/GAT. As a result, iOAT flight plans may be distributed by the IFPS to those military/civil units specified in the CACD.

(5) With the introduction of iOAT, the way to indicate any GAT and/or OAT elements in the route field of a flight plan remains unchanged (see more details in the IFPS User's Manual) except when neither GAT nor OAT is found in the route description, but EUR/OAT is present in Item 18, then the IFPS considers the entire routing to be conducted under iOAT.

(6) When analysing the route of a flight plan, the ability of the IFPS to determine whether the entire flight or portion(s) or thereof is conducted under OAT or iOAT relies solely on whether or not EUR/OAT in is present in Item 18

(7) The IFPS verifies whereby the speed is checked against the aircraft performance (e.g., different speed values for different FLs/altitudes) is not applicable to iOAT flights.

(8) It is possible to file a mixed GAT/iOAT flight plan providing the requirements listed above are fulfilled.

(9) The IFPS shall accept a requested flight level (RFL) ending with 5 when that RFL is inside an iOAT portion.

(10) iOAT flights are exempted from ATFM measures. However, a mixed flight (GAT/iOAT) may be subject to ATFM measures because of the GAT portion(s). In this case, only the GAT portion may be subject to ATFM measures, not the iOAT one.

(11) iOAT flight plans shall only be for military flights (indicated by the type of flight set to 'M') where the iOAT attribute for the flight shall be indicated by inserting EUR/OAT in Item 18: Other Information of the flight plan.

(12) The IFPS shall invalidate any flight plans that contain EUR/OAT when the flight type is not military.

(13) iOAT flights or portions of flight in iOAT shall not be subject to flight planning restrictions (e.g. DCT, FRA, terminal procedures, etc.) unless the relevant military authority has requested otherwise. In that case any flight planning restrictions also applicable to iOAT flights are published indicating such applicability.

(14) When a flight planning restriction is applicable to iOAT flights, it shall be possible to be exempted from the restriction (e.g. FUA or EU restriction).

5.8 NM system identification and rejection of flight plans containing Yo-Yo and sharp turn angle profiles

A basic requirement for effective Air Traffic Flow Management is having predictability on both the capacity and the demand side. Analyses have shown that so-called "yo-yo profiles" and "sharp-turn angle profiles" (Turn) in flight plans are almost never flown.

Yo-Yo and Turn profiles occur in flight plans for various reasons incl. wind component optimization, software limitations/bugs, airspace structure issues, compliance with airspace restrictions, company route maintenance limitations, avoidance of ATFM regulations, etc. Flight plan adherence is a joint responsibility of both pilots and air traffic controllers.

Note: Comprehensive information about the NM system functionality to identify and reject flight plans containing Yo-Yo and sharp turn angle profiles are available in the *Yo-Yo and sharp-turn angle flight plans identification* document.

5.8.1.1 Yo-Yo profiles

Based on the flight plan information, NM system will analyse the vertical profile of a flight to identify Yo-Yo characteristics:

- descent of at least 2000ft is followed by a climb of at least 3000ft, or
- descent of at least 3000ft is followed by a climb of at least 2000ft.

(values represent total vertical change achieved in descent/climb).

If these characteristics are present in the profile, the flight will become a Yo-Yo candidate, with a known Start and End of Yo-Yo sequence.

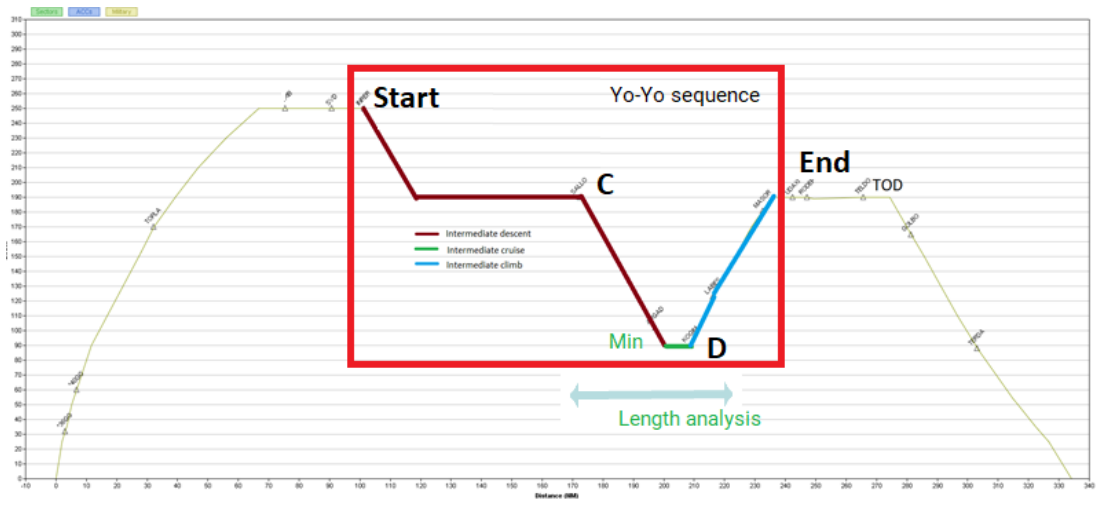


Figure 65: Yo-Yo profile example

Then, in order to mark a flight as a Yo-Yo, the NM system will analyse if over the defined length, centred around the lowest part (min level) of the Yo-Yo sequence, there is a vertical profile change that fulfils one of the criteria defined as below:

Vertical change	Length
Not candidate for REJ Category 2000/3000ft to 4000/5000ft	0 – 500 NM
Candidate for REJ Category 4000/5000ft and above	0 – 300 NM
Other – not visible / identified	N/A

Table 56: Yo-Yo vertical/length criteria

NOTE: Vertical change parameter represents the cumulative value of climb/descend considered over the defined length. Parameter e.g. 4000/5000 means that the flight needs to descent at least 4000ft and then climb at least 5000 ft or descend 5000ft and then climb at least 4000 ft, over 300NM to become a candidate for a rejection by NM system. For the practical reason, it will be written as 4000/5000 (=5000/4000) or 40/50 (=50/40). Climb/Descend might be continuous or in steps, interrupted with opposite vertical change less than 2000ft, which is ignored when Yo-Yo candidate is defined.

NOTE: Length criteria is measured from a significant point where a descent commences to a significant point where climb commences (Picture 1, C and D) – point where step in descent/climb commences to meet vertical criteria.

Yo-Yo flight plan will be rejected by NM system when all following conditions are met together with defined vertical/length criteria:

- Flight type is S, N, G (not M, X)
- Type of aircraft is not a helicopter
- Intermediate Yo-Yo interval is completely within IFPZ and completely visible (e.g. IFR, no STAY, no OAT etc.)
- Flight is not round-robin (ADEP=ADES)

Yo-Yo flight plan will not be rejected by IFPS when vertical/length criteria is satisfied if:

- Intermediate Yo-Yo portion is not completely within IFPZ and not completely *visible* (not completely IFR, STAY indicated, OAT…);
- Flight type is M, X;
- Type of aircraft is a helicopter;
- Flight is round-robin (ADEP=ADES or ZZZZ-ZZZZ with position at start and end of the profile equal).

Flight is exempt from IFPS rejection by using RMK/PROFYYINT in ITEM18 (NM will monitor this code utilisation in post-ops and AU may be contacted when non-adherence to the profile is detected).

NOTE: More details about Yo-Yo flight plan rejection are available in IFPS Users manual (PROF326).

5.8.1.2 Turn profiles

Based on the flight plan information, NM system will analyse horizontal profile of a flight to identify (sharp) TURN, based on the value of an angle between two consecutive segments of the trajectory:

Turn angle value
Not candidate for REJ 90 – 120 degrees
Candidate for REJ Above 120 degrees
Other – not visible / identified

Table 57: Turn angle value

TURN flight plan will not be rejected by IFPS when angle criteria are satisfied if:

- Turn segments are not completely within IFPZ and not completely visible (not completely IFR, STAY indicated, OAT…);
- Turn is at the enroute connecting point;Flight is round-robin (ADEP=ADES or ZZZZ-ZZZZ with position at start and end of the profile equal);
- Turn is within a radius of 60NM around the ADEP/ADES (buffer TMA);
- Turn point is below FL200 (buffer Level);
- Flight type is M, X;
- Type of aircraft is a helicopter.

NOTE: Flight will be rejected by IFPS when TURN is identified in TMA/Level buffer airspace in case TURN is 180 deg.

Flight is exempt from IFPS rejection by using RMK/PROFTURNINT in ITEM18 (NM will monitor this code utilisation in post-ops and AU may be contacted when non-adherence to the profile is detected).

NOTE: More details about TURN flight plan rejection are available in IFPS Users manual (PROF340).

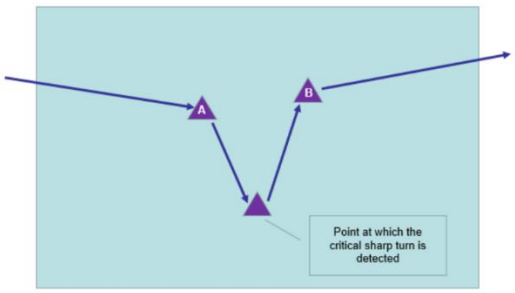


Figure 66: Sharp-Turn angle

Note: When identify TURN rejected by IFPS that has to be filed by AU in cases when no other routing option is possible, an Error Management restriction (EMR) rule will be used to allow automatic processing / acknowledgement of the flight plans containing that TURN. For each case threaded by EMR, there will be adequate follow-up with ANSP(s) concerned.

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6 Path Generator

(1) Path generator is a group of functions that create 4D flight profile alternatives that comply with a set of pre-defined constraints.

(2) Path generator requirements can be logically partitioned into the following steps:

- Reference profile creation: Takes into account pre-defined constraints and constructs the reference flight profile for which the 4D alternatives will be created;
- Graph creation: Uses as input the reference profile and a set of parameters and produces as output the set of all possible paths with their associated costs;
- 4D flight profile construction: Computes the indicators (RFL, requested speed, visibility, stay, EET, ATC reports) of each generated path using as input the reference profile associated indicators. Consequently, a 4D flight profile calculation is invoked for each one of the generated paths.

(3) The path generator functions are invoked within the context of ETACT (reported point lateral deviation processing), Map, Simulation and Experiment services (flight list display tools, re-route editor - GRRT) and Propose Routes or the Pathfinder.

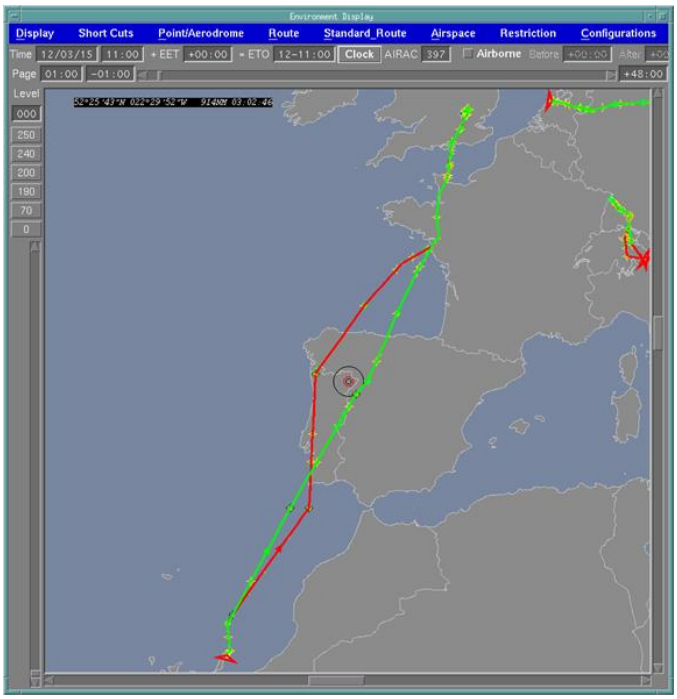


Figure 67: GRRT tool proposed solution (green - path generator result, red - filed flight plan)

(4) Prior to the graph creation, the system assembles and computes flight data that are used as a guiding template in the graph creation for the selected flight. The result of this computation is referred to as the reference profile.

(5) The reference profile consists of the following elements:

- Flight profile: Point profile for which the alternative paths will be generated with the associated indicators. These indicators are RFLs (RFL), requested speeds (RSP), visibility indicators (VIS), stay indicators (STAY), estimates (EET) and ATC reports (RPT);

- Frozen Portions: These are route portions of the flight profile that are always present in the generated 4D flight profile and for which there is no graph generated.

6.1 Graph creation

(1) Graph creation consists of creating sequences of connecting segments between the bounds of the non-frozen portion of the reference profile.

(2) Graph creation is implemented using Dijkstra's single source shortest path algorithm. The graph consists of a set of paths connecting the bounds of the non-frozen portion of the reference profile.

(3) Graph creation starting points on the reference profile are referred as graph bounds. A path consists of a sequence of segments. Each segment is assigned a cost than can be controlled with parameters. The cost of a path is the sum of all constituent segments cost. Each path of the graph connects with the lowest cost each constituent segment with the graph bounds. For each segment in the graph, there is only one path that connects this segment with the graph bounds. Due to the parameterised segment cost, a lowest cost path is not necessarily the shortest path.

(4) During graph creation, the system creates a new branch of the graph from every segment located in the non-frozen portion of the reference profile that has passed pre-defined checks. Each new branch expands over the existing route segment network as defined in the system's CACD. Graph expansions are done independently from each "side" (first side is associated with ADEP, last side is associated with ADES) of the reference profile and hence the graph consists of two independent expanded networks of segments.

(5) Each segment that is included in a path acts as a "source" segment, the segment's end point being the starting point of the following "candidate" segments to be visited and checked whether they can also be part of this path. Following terminology is used in the graph creation requirements:

- Candidate segment: The segment that is currently visited in the graph creation;
- Source segment: A segment previously visited in the graph creation, the end point of which (in the direction of the graph expansion), is the starting point of the candidate segment;
- Expansion location: The source segment's end point (in the direction of the graph expansion).

(6) A candidate segment is included in a path, if this segment passes a set of pre-defined segments checks. If there is already another path created that connects this segment with the same graph bound and if this path has a lower cost than the path currently examined in the graph creation, then the currently examined path is eliminated from the graph creation and vice-versa.

(7) The system considers avoid airspace constraints specified by the user during graph creation. A segment that intersects the ground projection of an airspace that must be avoided, does not qualify as a candidate segment in the graph expansion.

(8) The system stops the expansion of a path whenever the maximum expansion cost has been reached or when there is no candidate route segment left to expand to.

(9) The system reduces the number of candidate segments to be visited by performing a 'worst case' cost calculation. For each source segment, the system calculates the cost for the other "side" graph to expand to this segment via a straight line. If the cost of the path where the source segment belongs added to the lowest cost for the other graph exceeds the maximum expansion cost, the system stops the expansion from this source segment. This also provides with a more elliptical shaped graph pattern, instead of a graph pattern that expands to any direction.

(10) Depending on the context from where the path generator is invoked, the system can provide two options for choosing an alternative (lowest cost) path from the graph, namely Lowest_Cost_First or Shortest_Distance_First.

(11) Segments from the reference profile that are frozen shall cost zero, so that the accumulated cost at each frozen location (where expansion of the route network starts) is also zero for both locations. This is required because the maximum expansion cost has also been calculated using a zero cost for all frozen segments.

(12) For all other segments, the system calculates the cost as shown in the following equation:

Segment Cost = Segment Length Cost + Level Deviation Cost

(13) Each segment cost component is calculated as follows:

- Segment Length Cost: A cost calculated from the Segment Length, being converted to a distance (Distnc function) in kilometers, and multiplied by a factor depending on the kind of segment:

  Segment Length Cost = Distnc (Segment Length)

- Level Deviation Cost: A cost for a possible level deviation is calculated as shown in the following equation:

  *Level Deviation Cost = Distnc (Length In Not Available Bands) * Level_Off_Cost_Factor@*

(14) The system delimits the graph creation with the use of a maximum expansion cost. Whenever the cost of a path exceeds a maximum expansion cost, graph expansion is stopped along this path (but can continue along other paths).

(15) If not preferred SID or STAR is present then only ATS terminal procedures that connect to active runway configurations shall be used in the expansion (if no active runway configuration exists then the CACD default configuration shall be used).

(16) A candidate segment must pass the pre-defined checks described in the following sections:

- Segment angle check - The angle formed between the bearings of the candidate segment and the source segment must not exceed a maximum allowable value (different value for TMA and En_Route).
- Route sequence check - The source and candidate segments must follow a specific sequence, depending on whether they are departure procedure, arrival procedure segments or air route segments.
- Profile constraint check - The system will check the candidate segment against all VIA and AVOID point profile constraints that are defined.

- RSA avoidance - The system shall avoid generating paths that go through Restricted Areas (RSA) that are active during the flying period. Like for AVOID airspace constraints it shall compare the FL range of the RSA with the FL_Band of the candidate segment and it shall compare the occupancy period of the candidate segment with the activation period of the RSA and shall stop the expansion of this segment when a level or time overlap has been found. The occupancy period of the candidate segment is the time interval between the interpolated ETOs on either side of the segment.
- CDR availability check - The availability of the candidate segments is checked against the consolidated availability of all RouteSegments with the same definition. Hence, consolidated segment availability has no Air Route associated with it. Exceptions are TP segments since they do not share a common segment.
- Restriction check - The system checks segments against AC (SID/STAR) restrictions and verifies if the aircraft type used, is allowed to fly the associated TP. If this is not the case, all segments of the associated TP are no longer considered as candidate segments. The system shall check RAD restrictions against segments of the partial path as the reference location. Both segments and their constituent points are examined as reference . The system checks the DCT limit restrictions of candidate segments originating from the Reference Profile and if these are violated the system will not consider these candidate segments.

(17) Selection of Nearest Segments involves defining a path that connects the graph bounds of the reference profile with the required. This path consists of parts from the generated paths that include the required location or connect to this location via DCT. Following the selection of Nearest Segment(s), the system constructs a 2D track, using the lowest cost paths from the selected Nearest Segment(s) to each reference flight profile graph bound.

(18) The 4D flight profile construction involves first computing the new positions of the reference flight profile indicators on the 2D track of each generated path. Then a profile recalculation is invoked with the 2D track of each generated path and the associated indicator positions. Following the profile recalculation, the system invokes restriction checking for the generated 4D flight profile. If the restriction checks fail, the generated 4D flight profile is not considered as 4D flight profile alternative. Reference profile creation, graph creation and 4D flight profile construction result in a set of alternative 4D flight profiles. The system then selects from these alternative 4D flight profiles the ones that are sufficiently “different” so that the diversity in airspace penetration is not located only within a specific area around the paths, but is spread over the complete path length.

7 B2B

7.1 General Issues

(1) NM Operational Stakeholders not only need to exchange network operations information via applications but also need computer-to-computer interfaces. This interoperability with NM Operational Stakeholders is vital in order to ensure fast and efficient data sharing across the "ATM value chain" and more dynamic operations.

(2) The NM B2B Web Services give to eligible Operational Stakeholders a set of programming interfaces enabling the development of applications using web services for establishing direct interfaces with the NM systems and data.

(3) For interoperability reasons, NM B2B Web Services is based on open web services technologies that do not require the installation of proprietary software on the user's side and follows the architecture standards recommended by the SWIM concept.

(4) The NM B2B Services support two communication paradigms:

- Request/Reply – SOAP Web Services and POX (Plain Old XML); WSDL 1.1 and SOAP 1.1.
- Publish/Subscribe – Push and Pull mode; AMQP 1.0.

The payload is always XML. Standard exchange formats are used, when available. This is the case for the Airspace Services, which use AIXM, and for the FF-ICE Services, which use FIXM. All services make use of HTTPs.

The NM B2B Services Reference Manuals provide the detailed information of the services, their interfaces and exchange models. With this information, the customer can then develop the software that uses, in a standard way, these services and integrate them within their systems.

(5) The NM B2B Services are accessible via Internet and via NewPENS. Confidentiality and security are guaranteed by a strong authentication mechanism (using digital certificates – PKI), by the use of secure Internet protocols and by the NM security related processes and technical infrastructure. Access via NewPENS ensures an additional level of security and availability.

(6) An organisation profile concept is used to define and manage which NM B2B Services can be accessed by each type of organisation. CFSP and ground handling agents are required to demonstrate their direct implication in ATFM operations to have access to the NM B2B Services.

(7) Access to the Flight Plan Filing NM B2B Service requires a high level of quality in the flight plans submitted (automatic pass rate above 95%).

(8) Users who wish to subscribe to NM B2B Web Services must be aware that they will have to develop their own applications before being able to benefit from NM B2B Web Services.

7.2 NM B2B Web Services grouping

(1) The available NM B2B Web Services have been grouped into various operational domains:

a) **Flight Services**

- Flight Plan Preparation:
  - It includes the generation of available routes and flight plan Validation.
  - It provides the web services necessary for the preparation of a flight plan, before filing it to the NMO, while including information about the potential impact of the flow measures on the flight;
  - It allow access to the rerouting assistance service for applying the tried or generated route;
- Flight plan Management:
  - It provides multiple functions to support initial flight plan Filing, flight plan modifications, Cancellations and associated operations.
- Flight Data Retrieval:
  - It provides web services to query and retrieve information on flight plans and flights data.
- Departure Planning Information (DPI):
  - It provides web services for CDM Airports and Advanced Tower systems to send DPI messages to NM.
- Arrival Planning Information (API):
  - It provides services for the submission of target times (and other arrival information) in support of the arrival management processes.
- ATFCM slot related messages:
  - It provides services for the management of the flight readiness or confirming it into a regulation;
- Flight Update information:
  - It provides services allowing the submission of airborne flight information to NM (e.g., First System Activation message type).
- FF-ICE services
  - supports the ICAO FF-ICE/R1 filing, trial, flight data request and data publication services, and includes the distribution of flight plans to ANSPs.

b) **Airspace Services**

- Airspace availability
  It provides access to:
  - e-AMI (electronic Airspace Management Information); for access to the consolidated European AUP/UUP (Airspace Use Plan/Updated Use Plan) using the Aeronautical Information Exchange Model, AIXM with the ADR extension.
  - FUA Service; for the creation and update of AUP/UUP, using AIXM, with the ADR extension.
- Airspace Structure
  - It provides access to the most up-to-date and consistent view of NM operational airspace data using AIXM with ADR extension.

- It consists of web services giving access to static and dynamic airspace data:
  - AIP sourced data (Points, Routes, Aerodromes and Airspaces including Area of Responsibility (AoR)) including changes resulting from NOTAM implementation and AUP/UUP implementation;
  - ATFCM related airspace data; i.e. regulations, RAD and profile tuning restrictions, but also including other NM Restriction data.

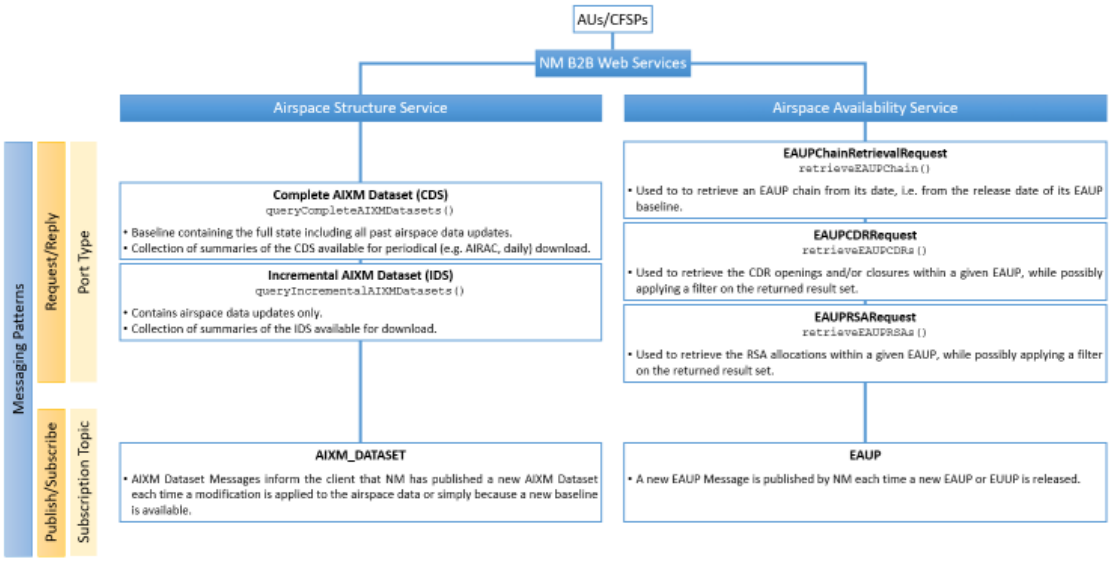


Figure 68: NM B2B - Airspace Services

c) Flow Services

- Regulation List:
  - It provides access to all regulation information used in the NM flow management systems.
- ATFCM situation request:
  - It provides information on the Network Situation (traffic, delays, delay causes and regulations) at a given time.
- Traffic Counts Retrieval:
  - It provides web services to query and retrieve Traffic Counts by Aerodrome, Aircraft Operator, Airspace, etc.
- ATFCM Tactical Update:
  - It provides services to manage ATFCM daily plan elements such as, Capacity Plan, Occupancy Traffic Monitoring Values (OTMV) Plan, Runway Configuration Plan, Sector Configuration Plan, Traffic Volume Activation Plan and Restriction Activation plan.
- Measures Management:
  - It provides services to manage regulation proposals, re-routings and regulations, both normal and cherry-pick regulations;
- Scenario Management:
  - It provides services to access ATFCM scenarios.

- Simulations:
  - It provides access to simulation capabilities allowing to perform network impact assessment of ATFCM measures.
- Measure Collaboration Decision Making (MCDM):
  - It allows coordination at 3 levels, giving the possibility to comment/approve/reject:
    - on measures;
    - on flights in the context of a measure;
    - on individual flights via eHelpdesk tickets, e.g., slot improvement, slot extension, exclusion from regulation, slot swap, request for information.

d) **General information services**

- AIM (ATFM Information Messages):
  - For access to the general Network Operations information as published in the AIMs.
- NM B2B Info:
  - For access to B2B documents, WSDL, XSC, Release Notes, examples.

(2) Publish/Subscribe services

The publish/subscribe services allow to subscribe to a topic and to receive asynchronous messages published on that topic. The subscription topics are currently the following: ATFCM Regulations, AIM, AIXM Datasets, EAUP/EUUP, Flight Plans, Flight Filing Result, Flight Data and MCDM. Various parameters are possible to fine-tune the subscriptions, in order to filter the messages that the user is interested in and to configure the set of fields to be sent in each message. The services include:

- Subscription management - services available in request/reply to allow the creation and management of subscriptions;
- Message consumption - services allowing the client to consume the messages via a message broker over AMQP 1.0, either in Pull or Push mode.

A NMOC Operational Validation Guidelines

A.1 Purpose and Objective

(3) The purpose of this Annex is to outline the necessary steps required by States / FABs / ANSPs in order to ensure the required level of compatibility with the NM systems with the envisaged airspace organization and flight planning procedures in the scope of FRA.

(4) The objective of a NMOC operational validation is to allow States / FABs / ANSPs to validate the impact of FRA on all NM systems on-site. The special exercises performed give mutual benefit for States / FABs / ANSPs who are able to actually assess the impact of their changes through the NM systems as well as for NMOC Airspace Data Section for which such reinforced co-operation leads to improvement in data quality. These exercises also give the opportunity to identify at Network level any side effects on the adjacent States / FABs / ANSPs.

(5) The request for NMOC operational validation and any subsequent data required shall be provided by States / FABs / ANSPs to the NMOC AIRAC Support and the NMOC AD Supervisor in accordance with the time period established by ERNIP Part 1. The relevant form for request of NMOC operational validation is given in section 5.4.

(6) The final Report from the NMOC operational validation shall be provided by NM not later than 1 (one) month after the validation.

A.2 General Requirements for FRA Data Provision and Verification

A.2.1 FRA Characteristic

(1) It shall be either in form of Concept of Operations document or a Draft AIP Publication and shall include as a minimum:

a) Lateral Limits;

b) Vertical Limits;

c) Applicable time;

d) Flight planning aspects - flight procedures for overflights, arrivals, departures, access to TMAs / CTRs, close proximity airports;

e) Status of ATS route network - available or withdraw during FRA.

A.2.2 Airspace Data

(1) It shall be either in form of Draft AIP Publication or separate .xls tables and shall include as a minimum:

a) FRA significant points definitions - 5LNCs or 3LNC NAVAIDs - clear indication of their purpose as: (E) - Entry, (X) - eXit, (I) - Intermediate, (A) - Arrival, (D) - Departure; reference to any airport procedures shall also be provided;

b) FRA significant points restrictions - 5LNCs or 3LNC NAVADs - restriction, normally as FL constraint;

c) Airspace Reservations - Special Areas if not published in CACD - clear indication of name-code, lateral limits in degree, minutes and seconds and vertical limits in VFR FLs or intermediate layer;

d) List of External Airports close to the FRA area;

e) List of Local (internal) Airports inside FRA area.

A.2.3 RAD Data

(1) It shall be in form of RAD Draft files and shall include as a minimum:

a) DCTs: Y - "Available" or N - "Not available";

b) DCT Limits;

c) Required restrictions - new or/and withdrawn.

(2) The relevant RAD template format/s shall be used.

A.2.4 Flight Plan Data

(1) Flight plans shall be in ICAO format.

(2) The following requirements shall be considered:

- ITEM 18: Other information DOF/ - the date of flight departure (DOF) shall be removed from the text of each flight plan; REG/ - registration markings of the aircraft;
- ITEM 10: Equipment and Capabilities / ITEM 18: Other information PBN/ - the provided information shall be compatible to each other to avoid inconsistent data;
- In the case of NMOC operational validation of Night time FRA in ITEM 13 the time of departure (estimated off-block time (EOBT)) and in ITEM 18 estimated elapsed time (EET) from take-off to relevant FIR boundary representing the entry into the validated FRA area shall be coherent with defined FRA applicability period.

(3) Flight plans shall be presented in form of ".txt" format, unless otherwise agreed with the NMOC Validation Team, with files containing a maximum of 20 flight plans. For easy recognition the name of these files shall follow the procedure to be validated, for example "Test Group 1 - FIR Boundaries Compliance" or "Procedure F1".

A.2.5 "Full FRA" model: FRA Significant Points data verification

(1) In case of FRA implementation based on "Full FRA" model the verification of the correct definition in CACD of Significant Point Types (PWP, NVA, COR, TER, etc.) shall be performed by States / ANSPs / FABs. This is important for proper "Full FRA" flight plan processing as not only en-route significant points can be used as FRA Intermediate points.

(2) Significant Point Type "PWP" includes all published 5LNCs including those used only for terminal/aerodrome purposes. Additionally these "terminal" 5LNCs cannot be defined as Significant Point Type "TER" - Terminal in CACD due to current system limitations where "TER" are only five-alpha numeric points. Verification requires correct definition of all PWP points that shall be used in "Full FRA" model.

(3) Significant Point Type "NVA" is divided in 14 sub-types including ILS/DME, LOC, MKR, etc. navigation aids not used for en-route purposes. Verification requires correct definition of all NVA points that shall be used in "Full FRA" model.

(4) All inconsistencies spotted by States / ANSPs / FABs shall be resolved by imposing a relevant EURO restriction. For example in order to allow proper "Full FRA" processing for each airport using PWP's (5LNCs) as terminal points EURO restriction shall be created to allow these points only for arrival / departure to / from these airports.

A.3 General Requirements for Flight Plan Test Procedures

Important Notes:

1. *The flight plan test procedures and the structure of the flight plans in this section were developed for the first time by BULATSA and were used for NMOC operational validation of Bulgarian Night FRA project in 2013.*
2. *Since then and with BULATSA approval they are used by the NM for NMOC operational validation for all other FRA projects following internal adaptations reflected in this Document.*

A.3.1 Procedures for Coding

(1) This section contains test procedures which are logically organized into test groups. Each procedure consists of one or more flight plans which shall be "loaded" into NM systems in order to observe compliance or deviation with intended system behaviour.

(2) For the NM system the test procedures have the following attributes:

- **Procedure Identifier** - sequential letter and number assigned to procedures for the purpose of easy identification and reference;
- **Procedure Purpose** - definition of the goal to be accomplished by the procedure;
- **Success criteria** - criteria under which the test procedure fails or passes;
- **Flight Plan Reference** - contains numbers of flight plans relevant to the procedure. Each flight plan is identified by an artificial call-sign. Call-signs are presented as codes containing success criteria and procedure test group. The reference coding is comprised of the following symbols:

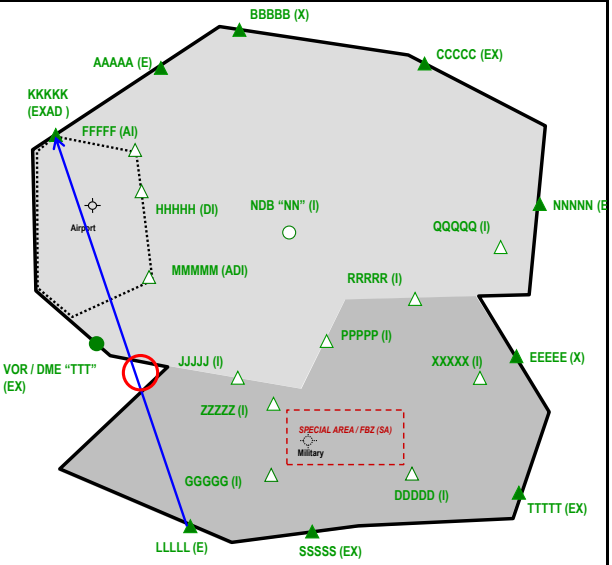
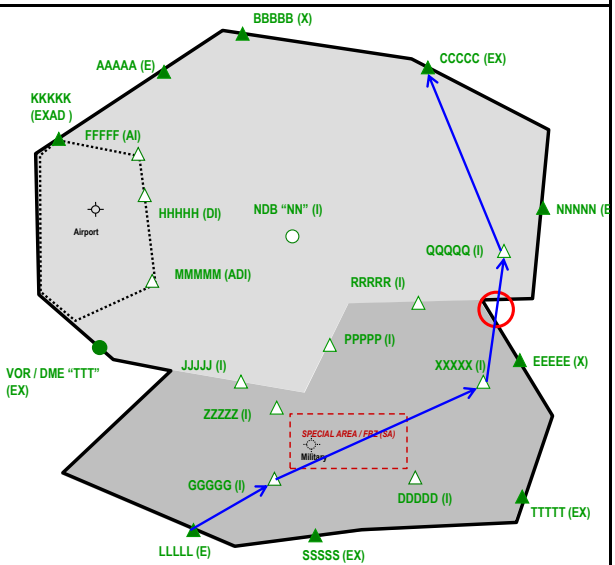
Symbol	Possible Values
Success criteria (one letter)	**A** - Flight plan has to be **A**ccepted by the system **R** - Flight plan has to be **R**ejected by the system
Test Group (one letter)	**F** - **F**RA area boundary compliance **S** - **S**pecial areas avoidance **E** - Transition To/From **E**xternal Airports **L** - Transition To/From **L**ocal Airports **C** - Transition Due Change of **C**ruising Level **P** - FRA relevant **P**oints Restriction **R** - **RAD traffic flow rule**s **N** - FRA **N**ormal Operations **T** - **T**ime Limits Compliance (for none H24 FRA only)
Procedure Number (one digit)	Procedure sequence
Flight Plan Number (two digits)	Sequential number identifying the flight plans from the procedure

For example test flight plan call-sign **AS101** means:
A - The flight plan is supposed to be accepted by the system
S - The test flight plan pertains to the “Special Area” test group
1 - The flight plan pertains to procedure number one from the test group
01 - This is the first flight plan from the procedure

A.3.2 Test Procedure Groups and Flight Plan Examples

Important Notes:
1. *The reference in flight plan examples below is a fictitious Night FRA area (FL245 - FL660) where relevant test group entities are underlined.*
2. *All flight plan examples are randomly chosen representing the minimum possible number but for NMOC operational validation preparation there is no limit in flight plans in each group to be prepared and validated.*

A.3.2.1 Test Group 1 - FRA area Boundaries Compliance

Procedure Identifier:	**F1**
Procedure Purpose:	To test NM system ability to reject flight plans that are not compatible with FRA borders (crossing the FRA lateral limits).
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	2
FPL Reference:	RF101 - DCT from entry to exit
(FPL-RF101-IS -B744/H-SDE2E3FGHIJ3J4J5M1RWXYZ/LB1D1 -OMDB2130 -... N0484F360 ... LLLLL DCT KKKKK ... -EDDF0610 EDFH -PBN/A1B1C1D1L1O1S1S2 NAV/RNVD1E2A1 DAT/SVM REG/DABTF EET/... SEL/BFKQ RVR/200 IFP/MODESASP OPR/DLH ORGN/EDDFDLHI RMK/TCAS ADSB)	
FPL Reference:	RF102 - using non-compliant intermediate segment
(FPL-RF102-IN -B738/M-SDFGHILORVWXYZ/LB1 -HEMA0035 -... N0448F370 ... LLLLL DCT GGGGG DCT XXXXX DCT QQQQQ DCT CCCCC ... -EPKT0426 EPWA EPKK -PBN/A1B2B3B4B5D1S2 COM/TCAS DOF/130512 REG/OKTVD EET/... SEL/LPJS RVR/200 ORGN/LKPRTVSX RMK/..)	

Procedure Identifier:	**F2**
Procedure Purpose:	To test NM system ability to accept flight plans that are not compatible with FRA borders (crossing the FRA lateral limits), but are defined as exceptions.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AF201

(FPL-AF201-IS

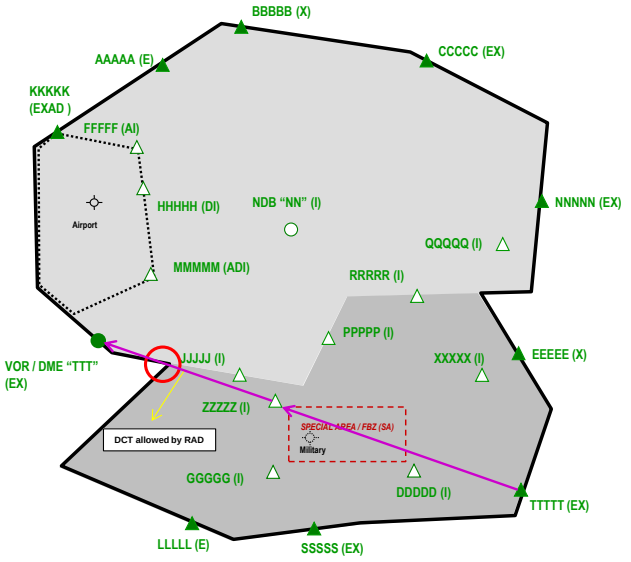
-B738/M-SADE2E3FGHIJ1RWXYZ/LB1

-EDDN0020

-... N0444F380 ... TTTTT DCT ZZZZZ DCT TTT ...

-LTAI0255 LTBS

-PBN/A1B1C1D1L1O1S2T1 NAV/RNVD1E2A1 COM/CPDLC DAT/V REG/DABMJ EET/... SEL/ARHQ RVR/075 OPR/BER ORGN/EDDTBERX RMK/TCAS)



A.3.2.2 Test Group 2 - Special Areas Avoidance

Procedure Identifier:	**S1**
Procedure Purpose:	To test NM system ability to reject flight plans that contain segments crossing special area airspace.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RS101 - entry-exit segment crossing special area

(FPL-RS101-IS

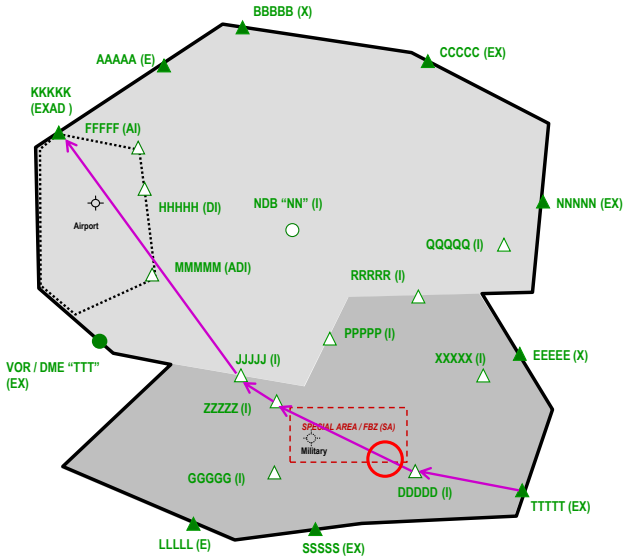
-A321/M-SDFGHIRWYZ/LB1

-LTBA0230

-… N0450F340 … TTTTT DCT DDDDD DCT ZZZZZ DCT JJJJJ DCT KKKKK …

-EDDT0238 EDDB

-PBN/B1D1S1S2 NAV/RNP APCH S1 S2 REG/TCJRG SEL/ERHM CODE/4BAA47 RVR/75 OPR/THY ORGN/LTBATHYW TALT/LTFJ RMK/TCAS)



Procedure Identifier:	**S2**
Procedure Purpose:	To test NM system ability to reject flight plans for flights changing cruising level from below FRA lower limit to above FRA lower limit but entering special area (from below / above).
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RS201 - changing cruising level over …

(FPL-RS201-IS

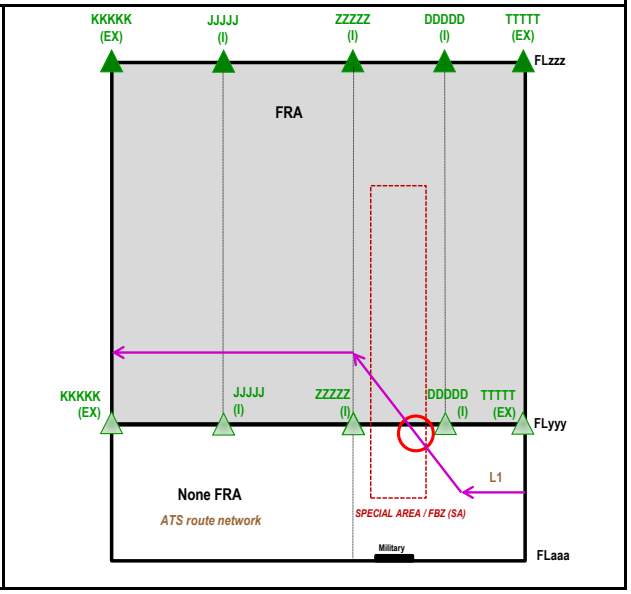
-A321/M-SDFGHIRWYZ/LB1

-LTBA0230

-… N0450F220 TTTTT DCT ZZZZZ/N0420F260 DCT KKKKK …

-EDDT0238 EDDB

-PBN/B1D1S1S2 NAV/RNP APCH S1 S2 REG/TCJRG SEL/ERHM CODE/4BAA47 RVR/75 OPR/THY ORGN/LTBATHYW TALT/LTFJ RMK/TCAS



Procedure Identifier:	**S3**
Procedure Purpose:	To test NM system ability to reject flight plans for descending out of FRA area inbounds an external airport and entering a special area below FRA lower limit.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RS301 - traffic descending ARR ….

(FPL-RS301-IS

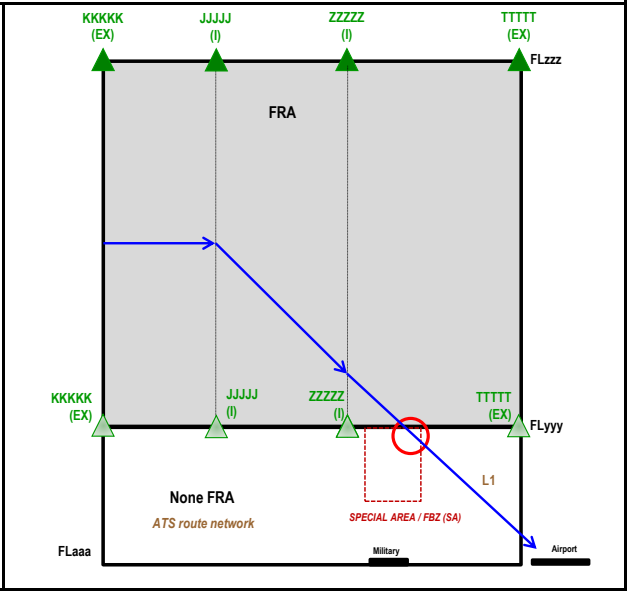
-B738/M-SDE2FGHIM3RWXYZ/L

-OKBK2255

-… N0453F370 … KKKKK DCT JJJJJ DCT ZZZZZ DCT TTTTT …

-LROP0345 LRCK

-PBN/A1B1C1D1O1 NAV/RNVD1E2A1 REG/N817SY EET/… SEL/FQEG RVR/550 OPR/SCX ORGN/KMSPSCXO PER/D RMK/KUWAIT AT CM 22 13 TURKEY ABD EF 2001 BULGARIA 5 17 ROMANIA AP13 EF TCAS EQUIPPED)



A.3.2.3 Test Group 3 - Traffic To/From External airports

Procedure Identifier:	**E1**
Procedure Purpose:	To test NM system ability to accept flight plans for flights descending out of FRA inbound airports located close, but outside FRA borders.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AE101 - traffic ARR … via …

(FPL-AE101-IS

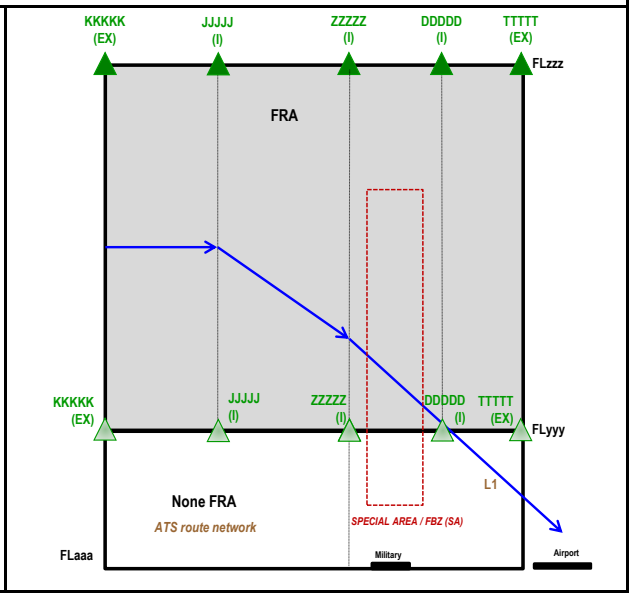
-B733/M-SDFGHIRWY/H

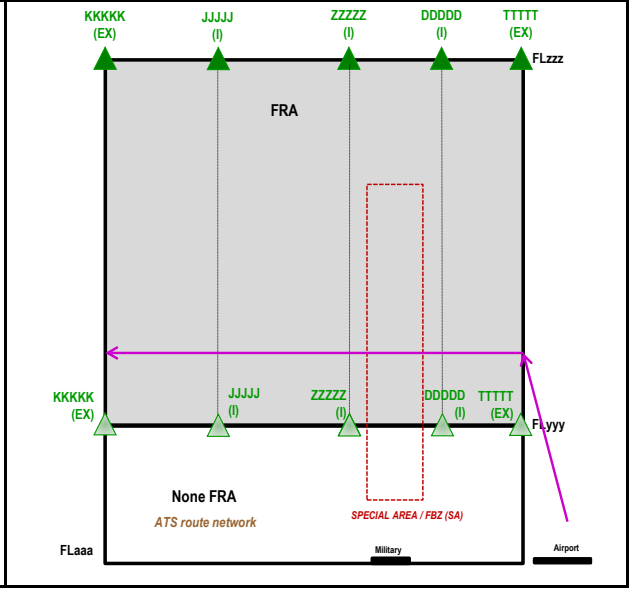
-HECA0025

-… N0460F370 … KKKKK DCT JJJJJ DCT ZZZZZ/N0465F270 DCT TTTTT …

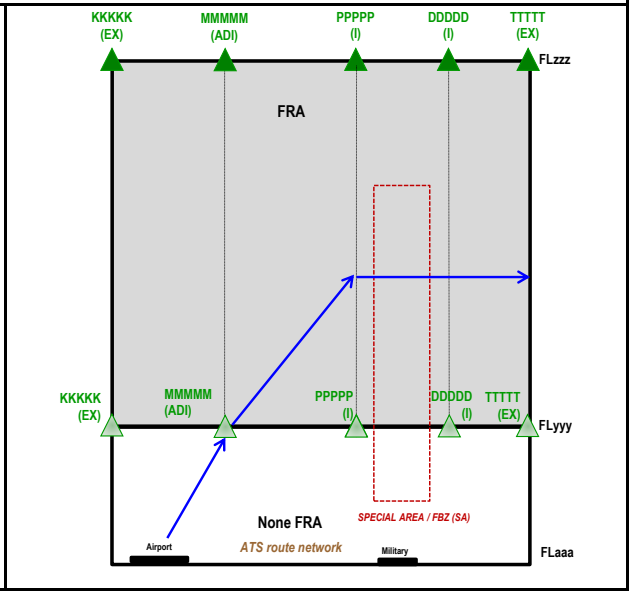
-LROP0245

-PBN/A1B3C3D3L1O3S1T1 RVR/200 OPR/ROT ORGN)



Procedure Identifier:	**E2**
Procedure Purpose:	To test NM system ability to accept flight plans for flights climbing into FRA outbound airports located close, but outside FRA borders.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AE201 - traffic DEP … via …
(FPL-AE201-IS -B738/M-SDE2E3FGHIRWYZ/LB1 -LTBA0115 -N0440F340 TTTTT DCT ZZZZZ DCT KKKKK … -ESSA0255 ENGM -PBN/B1D1S1S2 NAV/RNP APCH S1 S2 REG/TCJHE EET/… SEL/ERDF CODE/4BA905 RVR/200 OPR/THY ORGN/LTBATHYW TALT/LTFJ RMK/TCAS)	

A.3.2.4 Test Group 4 - Traffic To/From Local airports

Procedure Identifier:	**L1**
Procedure Purpose:	To test NM system ability to accept flight plans for flights climbing into FRA outbound local airports.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AL101 - traffic DEP … via …
(FPL-AL101-IS -A320/M-SDE1E2E3FGIRWXY/LB1 -LBWN2210 -N0450F370 MMMMM DCT PPPPP DCT TTTTT… -EGGW0315 EGSS -PBN/B1D1O1S2 REG/HALWG EET/… RVR/75 OPR/WZZ ORGN/VIEFZXH)	

Procedure Identifier:	**L2**
Procedure Purpose:	To test NM system ability to reject flight plans for flights descending out of FRA inbound local airports and outside of ATS route network (related to FRA where the use of ATS route network is mandatory for arrivals).
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RL201 - traffic ARR … via …

(FPL-RL201-IN

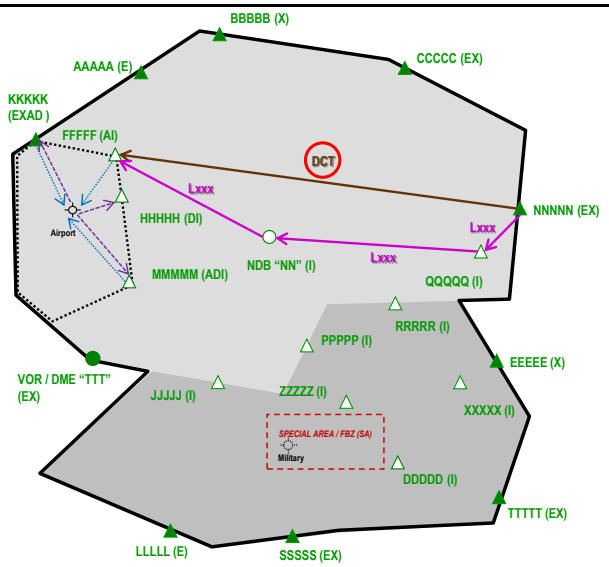
-C56X/M-SDE2FGRWXY/H

-EDTY2230

- … N0418F400 … NNNNN DCT FFFFF

-LBWN0210 LBBG

-PBN/A1B2B3B4C2D2 REG/DCBBB EET/… RVR/300 OPR/DC AVIATION ORGN/EDDSDCSC RMK/CALL SIGN TWINSTAR TCAS EQUIPPED ID DCS847 RTE DCA SEQ10005)



A.3.2.5 Test Group 5 - Traffic Transiting To/From FRA due change of cruising level

Procedure Identifier:	**C1**
Procedure Purpose:	To test NM system ability to reject flight plans for flights with a cruising level below FRA lower limit (depends on AUA DCT limit below FRA).
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RC101

(FPL-RC101-IS

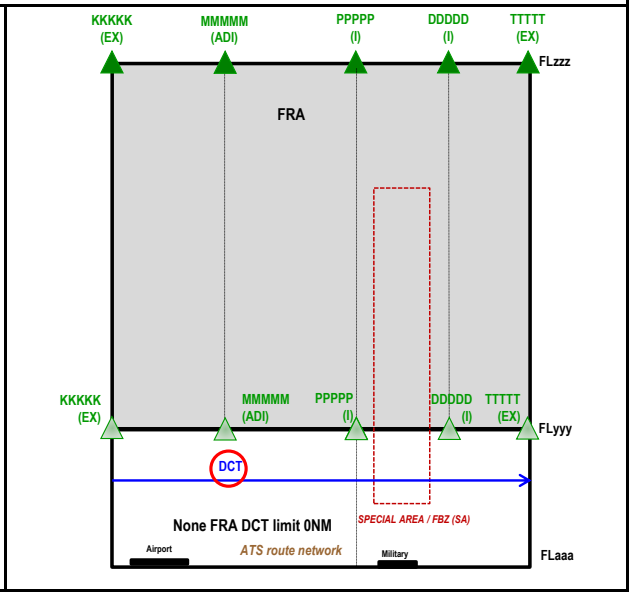
-A321/M-SDFGHIRWYZ/LB1

-LTBA0230

-N0450F220 KKKKK DCT PPPPP DCT TTTTT …

-EDDT0238 EDDB

-PBN/B1D1S1S2 NAV/RNP APCH S1 S2 REG/TCJRG SEL/ERHM CODE/4BAA47 RVR/75 OPR/THY ORGN/LTBATHYW TALT/LTFJ RMK/TCAS)



Procedure Identifier:	**C2**
Procedure Purpose:	To test NM system ability to reject flight plans for flights descending out of FRA and continuing on a cruising level below FRA lower limit.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RC201

(FPL-RC201-IN

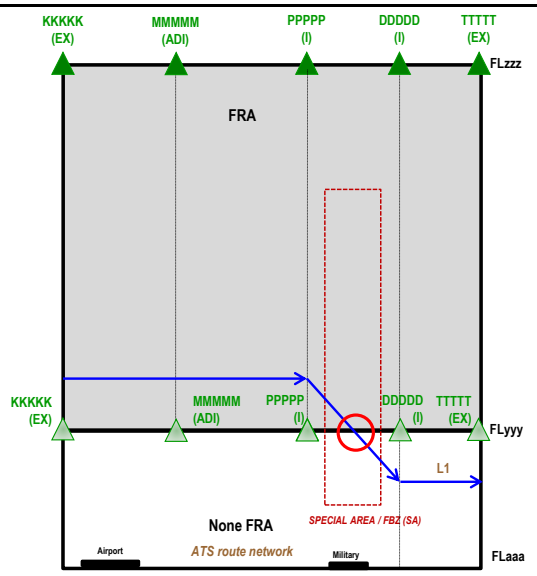
-A321/M-DE1E2E3FGHILORVWXYZ/H

-ESSA2200

-N0412F250 … KKKKK DCT DDDDD/N0406F230 DCT TTTTT …

-LTAI0400 LTBS

-PBN/A1B1C1D1L1O1 NAV/RNVD1E2A1 RNP4 REG/OYVKC SEL/EMRS RVR/75 OPR/VKG ORGN/EKCHVKGO PER/C TALT/ESSA RMK/PLAN 3410)



Procedure Identifier:	**C3**
Procedure Purpose:	To test NM system ability to reject flight plans for flights climbing into FRA and containing DCT below FRA lower limit.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RC301

(FPL-RC301-IS

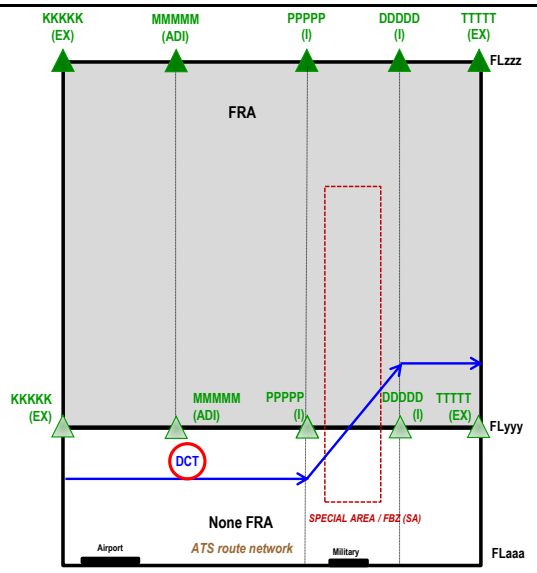
-A321/M-SDE1E2E3FGHIJ1RWYZ/LB1G1

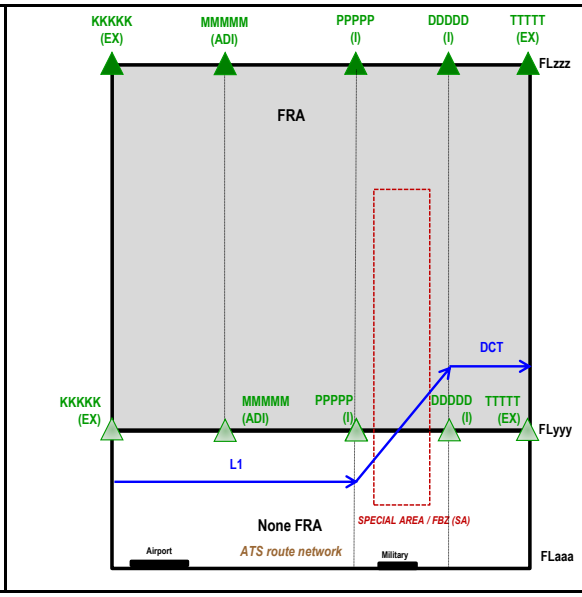
-EGLL2255

-N0440F230 … KKKKK DCT PPPPP DCT DDDDD/N425F270 DCT TTTTT …

-LTBA0324 LTFJ

-PBN/B1D1S1S2 NAV/RNP APCH S1 S2 REG/TCJRT EET/… SEL/KSCD CODE/4BAA54 RVR/75 OPR/THY ORGN/LTBATHYW TALT/EGKK RMK/TCAS)



Procedure Identifier:	**C4**
Procedure Purpose:	To test NM system ability to accept flight plans for flights climbing into FRA and containing DCT above FRA lower limit.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AC401
(FPL-AC401-IS -B77W/H-SDE1E2E3FGHIJ3J5J6M1M2RWXY/LB1D1 -LIMC2255 -N0479F230 … KKKKK L1 DDDDD/N0478F340 DCT TTTTT … -WSSS1145 WSAP -PBN/A1B1C1D1L1O1S2 REG/9VSWG EET/… SEL/DSCL OPR/SIA ORGN/WSSSSIAX RMK/ACASII EQUIPPED)	

A.3.2.6 Test Group 6 - FRA points restrictions

Procedure Identifier:	P1 and P2 - RESERVED FOR FUTURE USE

Procedure Identifier:	**P3**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that have filed via a FRA Intermediate point defined by geographical coordinates or by bearing and distance.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RP301 - intermediate point defined by geographical coordinates

(FPL-RP301-IS

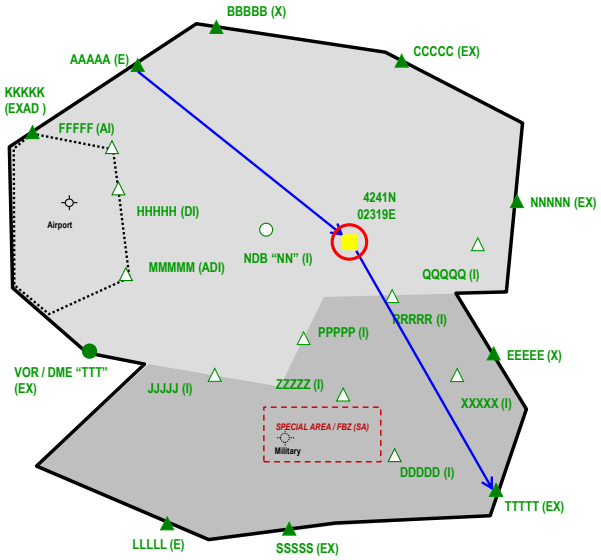
-B763/H-SDE3FHIRWXY/S

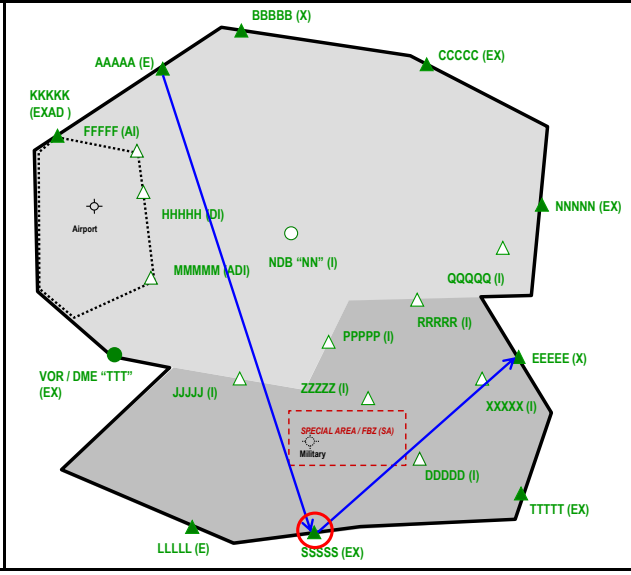
-EGLL2135

-N0460F370 … AAAAA DCT 4241N02319E DCT TTTTT …

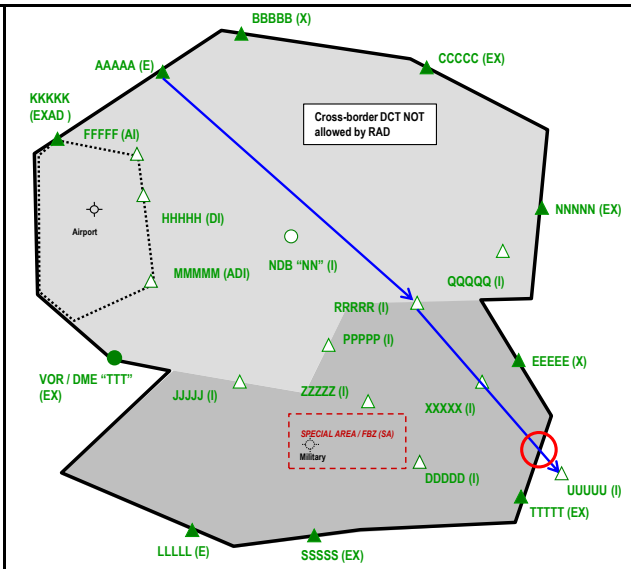
-LCLK0412 LCPH

-PBN/A1B3B4B5D3D4 SUR/TCAS REG/GBNWB EET/… SEL/HPBD CODE/40041C RVR/075 OPR/BAW ORGN/EGLLBAWH RMK/LAHSO NOT AUTHORISED)



Procedure Identifier:	**P4**
Procedure Purpose:	To test NM system ability to reject flight plans that contain a FRA Entry or a FRA Exit point as a FRA Intermediate point.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RP401 - Entry / Exit point used as intermediate
(FPL-RP401-IS -A320/M-SDE1FGHIJ1RWY/S -OTBD2230 - … N0442F370 … AAAAA DCT SSSSS DCT EEEEE … -EDDT0556 EDDB -PBN/A1B1D1L1S1 REG/A7AHB EET/… SEL/AJBS OPR/QTR ORGN/OTBDZTZX RMK/TCAS)	

A.3.2.7 Test Group 7 - RAD traffic flow rules

Procedure Identifier:	**R1**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that have filed a FRA cross-border DCT.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RR101
(FPL-RR101-IN -A320/M-SDFGIRWXY/LSB1 -LCLK2105 -N0450F370 … AAAAA DCT RRRRR DCT UUUUU … -EPWA0320 EPKT -PBN/A1B5C1D1O1S1 REG/SPHAC EET/… SEL/BKGR OPR/SMALL PLANET AIRLINES SPZOO ORGN/EKBICPUF RMK/OPS ..)	

Procedure Identifier:	**R2**
Procedure Purpose:	To test NM system ability to accept flight plans for flights that have filed a FRA cross-border DCT defined as an exception.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AR201

(FPL-AR201-IN

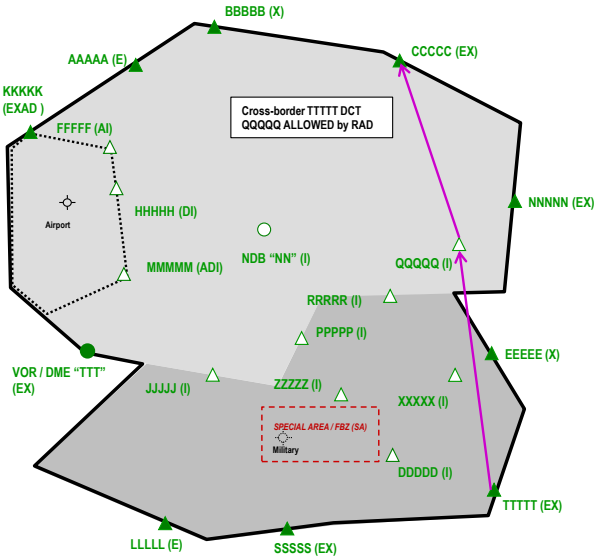
-A306/H-SDFHIRWY/L

-LTAI2200

-N0454F360 … TTTTT DCT QQQQQ DCT CCCCC …

-UKBB0210 UKCC

-PBN/A1B3B4B5D3D4O3O4 REG/TCOAH EET/… SEL/DRCE OPR/OHY ORGN/ISTOW8Q)



Procedure Identifier:	**R3**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that have filed in FRA via FRA Exit point not allowed for certain arrivals.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RR301

(FPL-RR301-IS

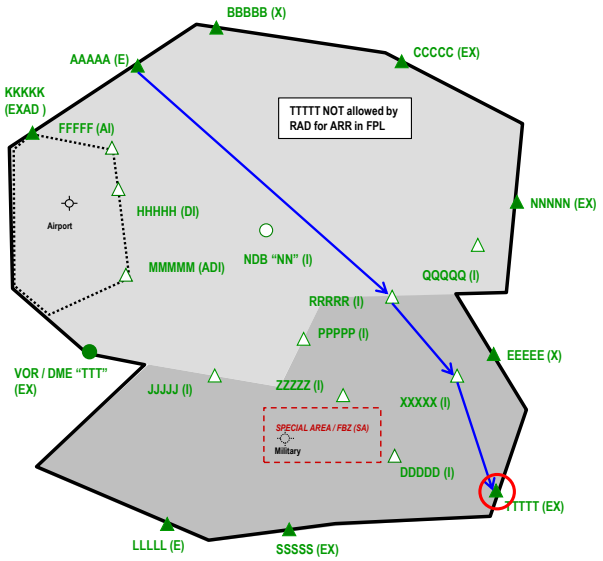
-AT72/M-SDFGHRWY/S

-LTBA2200

-N0280F260 … AAAAA DCT RRRRR DCT XXXXX DCT TTTTT …

-LYBE0153 LYPG LWSK

-PBN/B2B3 REG/YU ALN EET/LBSR0031 LYBA0117 RVR/300 ORGN/BEGNAJU



Procedure Identifier:	**R4**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that have filed in FRA via FRA Entry point not allowed for overflights.
Success Criteria:	All flight plans from this procedure are rejected by NM system
Number of FPLs	1
FPL Reference:	RR401

(FPL-RR401-IS

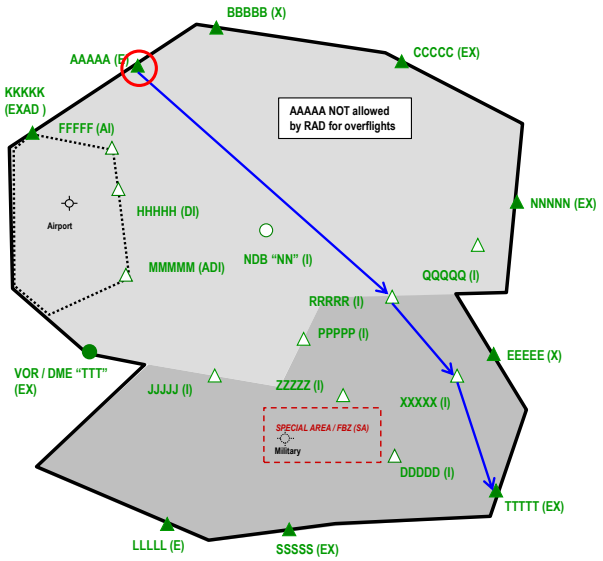
-B738/M-SDFGHILORVWY/SB1

-LTAC2335

-N0441F370 … AAAAA DCT RRRRR DCT XXXXX DCT TTTTT …

-EDDF0309 EDDK

-PBN/A1B1C1D1L1O1S2T2 REG/DASXD SEL/JQHM RVR/125 IFP/MODESASP OPR/SXD ORGN/EDDFSXSX RMK/TCAS)



Procedure Identifier:	**R5**
Procedure Purpose:	To test NM system ability to accept flight plans for flights that have filed in FRA via FRA Entry point allowed for certain departures.
Success Criteria:	All flight plans from this procedure are accepted by NM system
Number of FPLs	1
FPL Reference:	AR501

(FPL-AR501-IS

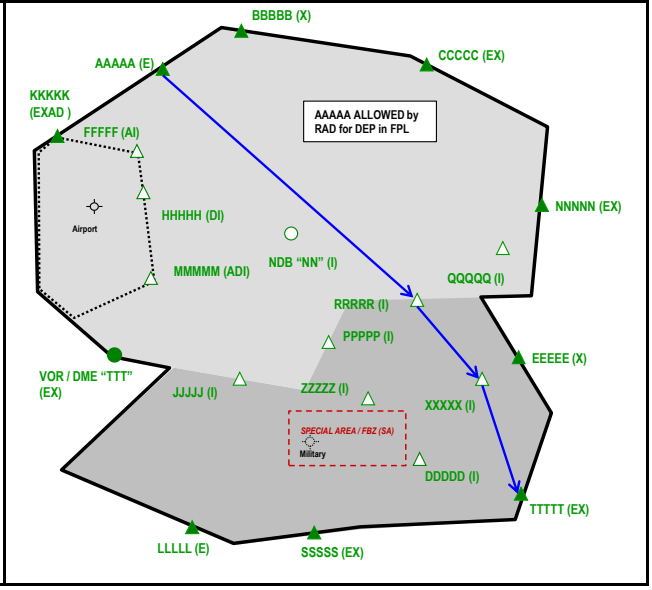
-B738/M-SDE2E3FGHIRWYZ/LB1

-LTBA2200

-N0450F410 … AAAAA DCT RRRRR DCT XXXXX DCT TTTTT …

-EDDL0303 EDDK

-PBN/B1D1S1S2 NAV/RNP APCH S1S2 REG/TCJGY EET/… SEL/ERCK CODE/4BA8F9 RVR/200 IFP/MODESASP OPR/THY ORGN/LTBATHYW TALT/LTFJ RMK/TCAS)



A.3.2.8 Test Group 8 - Normal FRA FPL Messages

Procedure Identifier:	**N1**
Procedure Purpose:	To test NM system ability to accept flight plans that are acceptable for FRA operations in FRA area.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AN101

(FPL-AN101-IS

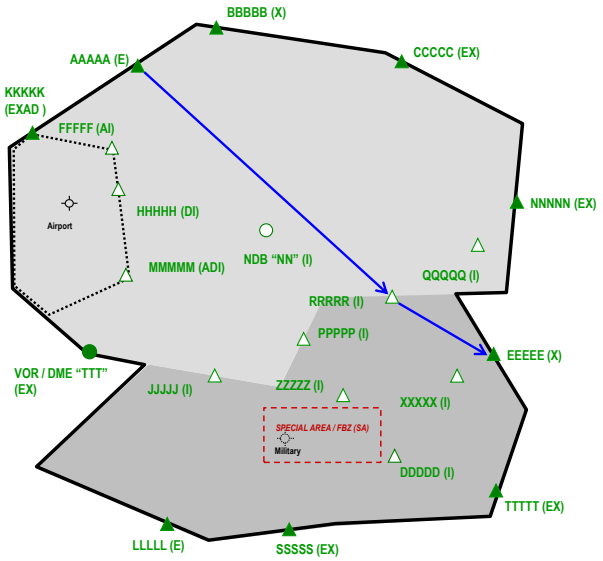
-A321/M-SDFGHIRWYZ/LB1

-LTBA0230

-N0450F350 … AAAAA DCT RRRRR DCT EEEEE …

-EDDT0238 EDDB

-PBN/B1D1S1S2 NAV/RNP APCH S1 S2 REG/TCJRG SEL/ERHM CODE/4BAA47 RVR/75 OPR/THY ORGN/LTBATHYW TALT/LTFJ RMK/TCAS)



Procedure Identifier:	**N2**
Procedure Purpose:	To test NM system ability to reject flight plans using ATS route network within FRA area when ATS route network is withdrawn.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RN201

(FPL-RN201-IS

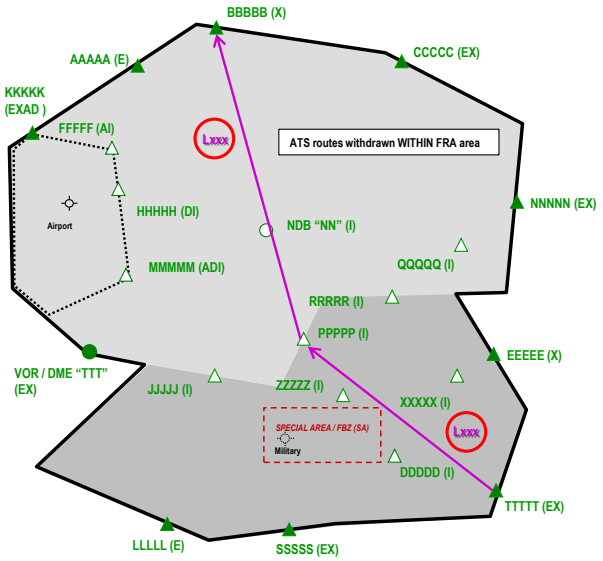
-B738/M-SDFGHILORVWY/SB1

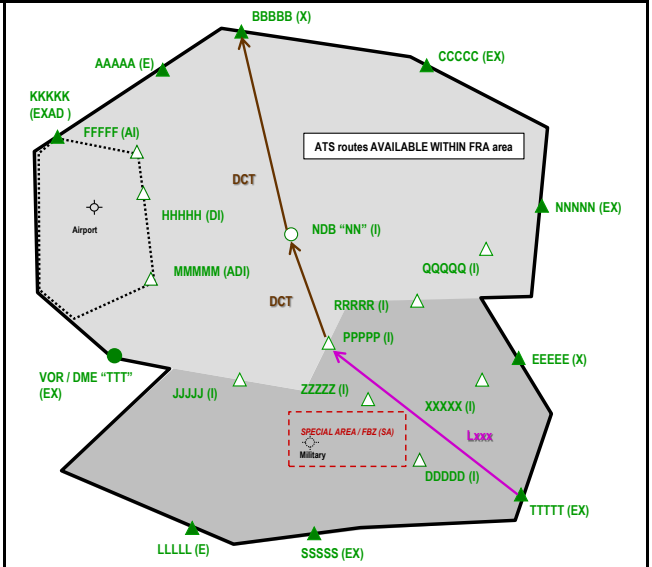
-LTAC2335

-N0447F380 … TTTTT Lxxx PPPPP Lxxx BBBBB …

-EDDF0307 EDDK

-PBN/A1B1C1D1L1O1S2T2 REG/DASXS EET/… SEL/JRFL RVR/125IFP/MODESASPOPR/SXD ORGN/EDDFSXSX RMK/TCAS)



Procedure Identifier:	**N3**
Procedure Purpose:	To test NM system ability to accept flight plans using ATS route network within FRA area when ATS route network is available.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AN301
(FPL-AN301-IS -B738/M-SDFGHILORVWY/SB1 -LTAC2335 -N0447F380 … TTTTT Lxxx PPPPP DCT NN DCT BBBBB … -EDDF0307 EDDK -PBN/A1B1C1D1L1O1S2T2 REG/DASXS EET/… SEL/JRFL RVR/125IFP/MODESASPOPR/SXD ORGN/EDDFSXSX RMK/TCAS)	

A.3.2.9 Test group 9 - FRA Time Limits Compliance (only for none H24 FRA)

Procedure Identifier:	**T1**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that arrive at the FRA Entry point before the beginning of FRA applicability period.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RT101

(FPL-RT101-IS

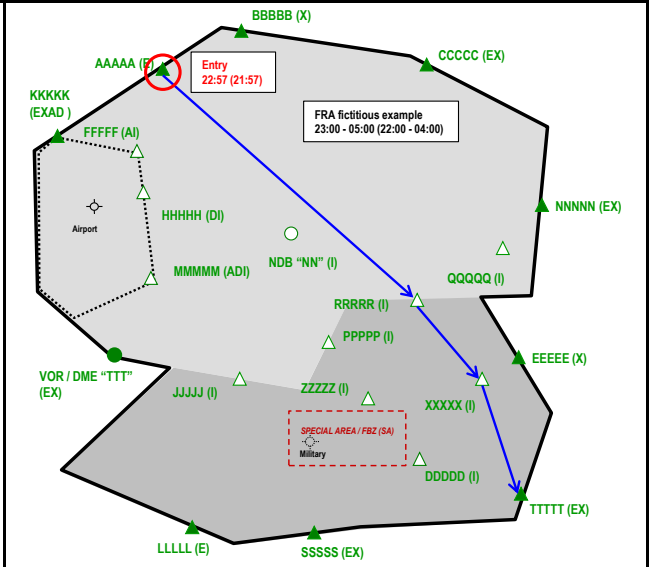
-A321/M-SDE2E3FGHIRWXY/S

-EGLL1830

-N0452F330 … AAAAA DCT RRRRR DCT XXXXX DCT TTTTT …

-LLBG0434 LCLK

-PBN/A1B1D1O1S2 SUR/TCAS REG/GMEDG EET/…SEL/ESLP CODE/400965 RVR/075 OPR/BAW ORGN/EGLLBAWH RMK/LAHSO NOT AUTHORISED)



Procedure Identifier:	**T2**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that arrive at the FRA Entry point after the end of FRA applicability period.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RT201

(FPL-RT201-IS

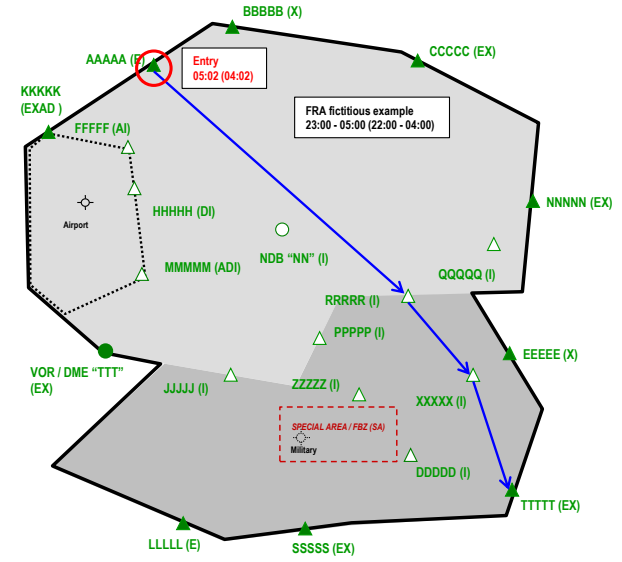
-A306/H-SDFGHIRWXY/L

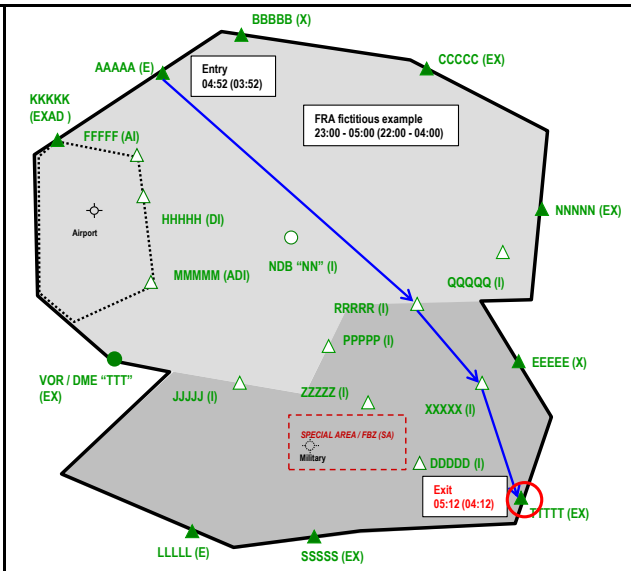
-EDDK0220

- …N0456F310 … AAAAA DCT RRRRR DCT XXXXX DCT TTTTT…

-LTBA0242 LTBU LTBJ

-PBN/A1B1D1 REG/TCMNV EET/… SEL/BGAJ ORGN/LTBAMNBX RMK/CALLSIGN BLACKSEA)



Procedure Identifier:	**T3**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that arrive at the FRA Entry point before the end of FRA applicability period but exit after the end of FRA applicability period.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RT301
(FPL-RT301-IN -B738/M-SDFGHILORVWY/SB1 -EDDK0150 - … N0443F370 … AAAAA DCT RRRRR DCT XXXXX DCT TTTTT … -LTAI0312 -PBN/A1B1C1D1L1O1S2T1 REG/TCSNO EET/… SEL/FKMP RVR/125 OPR/SXS ORGN/EDDFSXSX RMK/TCAS)	

Procedure Identifier:	**T4**
Procedure Purpose:	To test NM system ability to reject flight plans for flights that arrive at the FRA Entry point before the beginning of FRA applicability period but exit after the beginning of FRA applicability period.
Success Criteria:	All flight plans from this procedure are rejected by NM system.
Number of FPLs	1
FPL Reference:	RT401

(FPL-RT401-IS

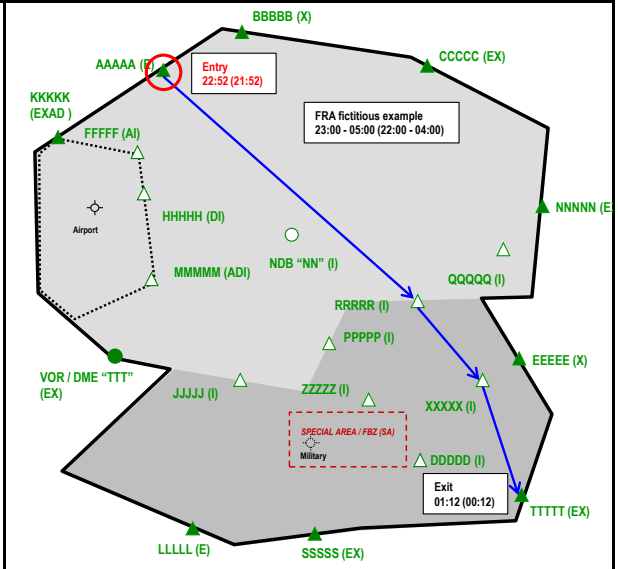
-B77W/H-SDE2E3FGHIJ3J5J6M1M2RWXY/LB1D1

-OMDB1805

- … N0486F370 … AAAAA DCT RRRRR DCT XXXXX DCT TTTTT …

-LFPG0636 LFPO

-PBN/A1B1C1D1S1 REG/FGZNC EET/… SEL/BMGS IFP/MODESASP OPR/AFR ORGN/OMDBZPZX RMK/IRAN PERMIT YK 1F 287146 ALA)



Procedure Identifier:	**T5**
Procedure Purpose:	To test NM system ability to accept flight plans for flights that arrive at the FRA Entry point before the end of FRA applicability period and exit after the end of FRA applicability period but have filed a flight plan only up to the end of FRA applicability period and then continue via ATS route network.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AT501

(FPL-AT501-IS

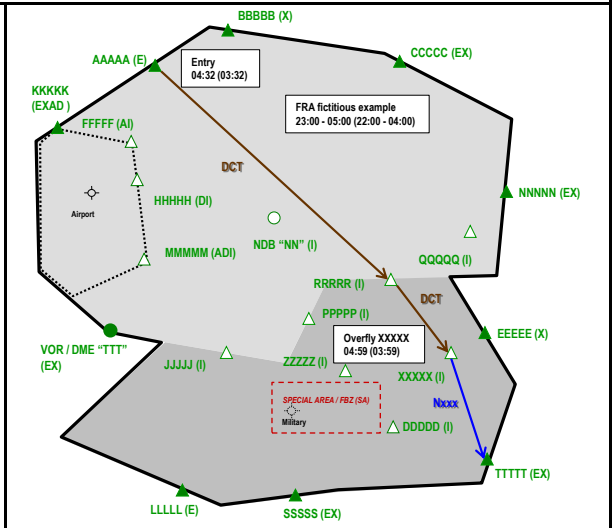
-B744/H-SDE2E3FGHIM3RWXY/H

-LIMC0210

- … N0484F350 … AAAAA DCT RRRRR DCT XXXXX Nxxx TTTTT …

-RKSI1105 RKSS

-PBN/A1B1C1D1S1S2 REG/HL7417 EET/… SEL/DSCR CODE/71BC17 OPR/AAR ORGN/RKSSAARO RALT/LOWW UAAA ZBAA RIF/DKO A596 KM ZBAA RMK/TCAS II EQUIPPED CARGO)



Procedure Identifier:	**T6**
Procedure Purpose:	To test NM system ability to <u>accept</u> flight plans for flights that arrive at the FRA Entry point before the beginning of FRA applicability period and exit after the beginning of FRA applicability period but have filed via ATS route network up the beginning of FRA applicability period and then using DCT.
Success Criteria:	All flight plans from this procedure are accepted by NM system.
Number of FPLs	1
FPL Reference:	AT601

(FPL-<u>AT601</u>-IS

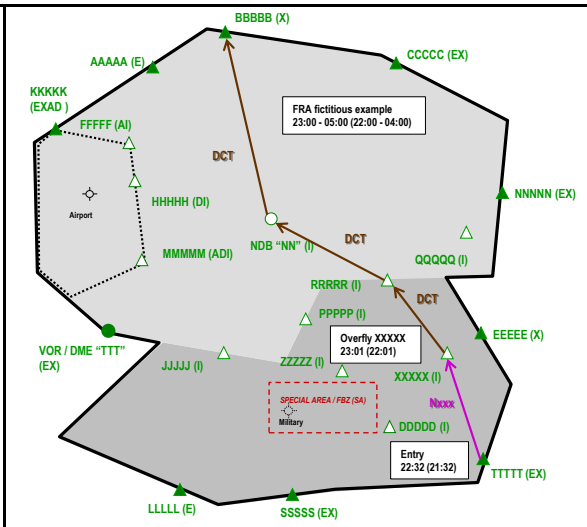
-B744/H-SDE2E3FGHIM3RWXY/H

-LIMC2030

- … N0484F360 … <u>TTTTT Nxxx XXXXX DCT RRRRR DCT NN DCT BBBBB</u> …

-RKSI1105 RKSS

-PBN/A1B1C1D1S1S2 REG/HL7417 EET/… SEL/DSCR CODE/71BC17 OPR/AAR ORGN/RKSSAARO RALT/LOWW UAAA ZBAA RIF/DKO A596 KM ZBAA RMK/TCAS II EQUIPPED CARGO)



A.4 Request Form

(1) The request by relevant State / FAB / ANSP National Environment Coordinator (NEC) for NMOC operational validation shall be send to NMOC AIRAC Support and AD Supervisor in accordance with time period requirements established by the ERNIP.

REQUEST FOR NMOC OPERATIONAL VALIDATION					
Addressees : **EUROCONTROL - NMD** **To AIRAC Support** : nm.ad.airac@eurocontrol.int **Copy AD Supervisor** : nm.ad.spvr@eurocontrol.int					
NMOC OPERATIONAL VALIDATION					
Originator			NM AD CONTACT		
Name			Name		
Phone			Phone		
e-mail			e-mail		
ANSP					
Participants/Contact Person(s)					
Name			Phone		
e-mail					
Name			Phone		
e-mail					
Operational Implementation Date		AIRAC		Date	
Deadline for Data delivery to AIRAC Support					
Extra Tape / RAD+2 Tape					
Date of Validation Exercise					
TYPE OF VALIDATION					
A	Only ENV / CHMI	Yes	☐	No	☐
B	A + IFPS profiles (+RAD)	Yes	☐	No	☐
C	A + B + ETFMS Profiles	Yes	☐	No	☐
FPLs					
FPLs Needed		Yes	☐	No	☐
1 day of Traffic (NM area) only if no ENR changes		Week / Weekend / Both			
Specific FPLs delivered by ANSP to AIRAC Support (in ICAO format)		Yes	☐	No	☐
		Max Date of Delivery:			
Assistance needed from NM		Yes	☐	No	☐

Acronyms

Term	Definition
5LNC	Five Letter Name-Codes (for Designated Points)
A	Arrival (point)
ACC	Area Control Centre
AD	Aerodrome / Airspace Data
AD SVR	Airspace data supervisor
ADEP	Aerodrome of Departure
ADES	Aerodrome of Destination
ADEXP	ATS Data Exchange Presentation)
ADIZ	Air Defence Identification Zone
AGL	Airfield Ground Lighting
AIC	Aeronautical Information Circular
AIP	Aeronautical Information Publication
AIRAC	Aeronautical Information Regulation And Control
AIS	Aeronautical Information Service
AIXM	Aeronautical Information Exchange Model
AMA	AMC manageable
AMC	Airspace Management Cell
ANM	ATFCM Notification Message
ANNC	Alpha Numeric Name-Codes
ANSP	Air Navigation Service Provider
AO	Aircraft Operator
AoR	Area of Responsibility
AOWIR	Aircraft Operator What-if Reroute
APP	Approach control office or approach control or approach control service
ARCID	Aircraft ID
ARR	Arrive or Arrival
ASM	Airspace Management
ATC	Air Traffic Control
ATFCM	Air Traffic Flow and Capacity Management
ATM	Air Traffic Management
ATS	Air Traffic Services
ATZ	Aerodrome Traffic Zone
AUA	ATC Unit Airspace

AUAG	ATC Unit Airspace Group
AUP	Airspace Use Plan
AURA	Airspace Utilisation Rules and Availability
AWY	Airway
B2B	Business to Business
BOC	Bottom Of Climb
BOD	Bottom Of Descent
CACD	Central Airspace and Capacity Database
CADF	ECAC Centralised Airspace Data Function
CBA	Cross Border Area
CDR1	Conditional Route
CEL	Ceiling
CHMI	Collaboration Human Machine Interface
CIAM	Collaborative Interface for Airspace Management
COR	Coord point
CPR	Correlated Position Report
CRAS	Composed RAS
CRSA	Composed RSA
CTA	Control Area
CTOT	Calculated Take-Off Time
CTR	Control Zone
D	Departure (point) / Danger Area
DAL	Distance At Location
DCT	Direct Routeing
DEP	Depart or Departure
DME	Distance Measuring Equipment
DPI	Departure Planning Information
E	Entry (point)
EAD	European AIS Database
eAMI	Electronic ASM Information
eAU	An AU that is capable of using the mandatory FF-ICE services
eATCU	An ATCU that is capable of consuming eFPLs
EAUP	European Airspace Use Plan
EAW	Early Access to Weekend

ECAC	European Civil Aviation Conference
EET	Estimated Elapsed Time
eFPL	FF-ICE flight plan in FIXM format
ENR	En Route
EOBT	Estimated Off-Block Time
e-RAD	electronic Route Availability Document
ERND	European Route Network Design
ERNIP	European Route Network Improvement Plan
ERAS	Elementary RAS
ERSA	Elementary RSA
ETFMS	Enhanced Tactical Flow Management System
ETO	Estimated Time Over
ETOT	Estimated Take-Off Time
EU	European Union / Identifier for Restriction (for NMOC purposes only)
EU res	European restriction
EUUP	European Updated Airspace Use Plan
FAB	Functional Airspace Block
FBZ	FPL Flight planning Buffer Zone
FF-ICE	Flight & Flow Information for a Collaborative Environment
FIR	Flight Information Region
FL	Flight Level
FLOS	Flight Level Orientation Scheme
FLR	- Floor/ Flight Level Range
FMP	Flow Management Position
FPL	Filed Flight PlanICAO FPL2012 Flight plan
FP	Flight Planning
FRA	Free Route Airspace
FUA	Flexible Use of Airspace
FUA res	Flexible Use of Airspace restriction
GAT	General Air Traffic
GND	Ground
GUFI	FF-ICE Globally Unique Flight Identifier
HLABP	National High Level Airspace Policy Body
HTZ	Helicopter Traffic Zone
I	Intermediate (point)
IAF	Initial Approach Fix
IATA	International Air Transport Association
ICAO	International Civil Aviation Organization

ID	Identification
IFPL	Flight plan in ADEXP format
IFPS	Integrated Initial Flight Plan Processing System
IFPU	Integrated Initial Flight Plan Processing Unit
IFPZ	IFPS Zone
IFR	Instrument Flight Rules
ILS	Instrument Landing System
iOAT	Improved Operational Air Traffic
ISBN	International Standard Book Number
ISO	International Organization for Standardization
LEC	Local Environment Coordinator
LNC	Letter Name Code
LoA	Letter of Agreement
LOC	Locator
MKR	Marker radio beacon
MLS	Microwave Landing System
MRA	Military Reserved Area
MTA	Military Training Area
NAM	Non-AMC manageable
NAVAID	Navigation Aid
NDB	Non-Directional Beacon
NEC	National Environment Coordinator
NM	Network Manager / Nautical Mile
NMD	Network Manager Directorate
NMOC	Network Manager Operations Centre
NOP	Network Operations Portal
NOTAM	NOTice to Air Men
NPZ	Non-standard Planning Zone
NRC	National RAD Coordinator
NVA	Navigation Aid (for NMOC purposes only)
OAT	Operational Air Traffic
OCA	Oceanic Control Area
OM	NM Operations Manager
ORM	Operational Reply Message
P	Prohibited Area
PBN	Performance Based Navigation
PTR	Profile Tuning Restriction
PS	PointSet (Set of Points)

PWP	Published Waypoint (for NMOC purposes only)
QFU	Magnetic Bearing Of The Runway
QNH	Altimeter sub-scale setting to obtain elevation when on the ground (ICAO definition)
R	Restricted Area
RAD	Route Availability Document
RAS	Regulated Airspace
RCA	Restricted Coordination Area
RD	Route Designator
RFL	Requested Flight Level
RFP	Reference Point
RNAV	Area Navigation
RPL	Repetitive Flight Plan
RSA	Restricted Airspace
RSO	Route per State Overflown
RWY	Runway
SFC	Surface
SID	Standard Instrument Departure
SSC	Single CDR Category environment
STAR	Standard Instrument Arrival
SWIM	System-Wide Information Management
TACAN	Tactical Air Navigation
TER	Terminal point (for NMOC purposes only)
TCP-V	Trajectory Change Point – Vertical
TIS	Time to Insert the Sequence
TMA	Terminal Control Area
TOC	Top of Climb
TOD	Top Of Descent
TOW	Take-off Weight
TP	Terminal Procedure
TRA	Temporary Reserved Area
TRS	Time to Remove from Sequence
TSA	Temporary Segregated Area
TTL EET	Total Estimated Elapsed Time
UAC	Upper Area Control Centre
UFN	Until Further Notice
UIR	Upper Flight Information Region
UNL	Unlimited

UTA	Upper (Traffic) Control Area
UTC	Coordinated Universal Time
UUP	Updated Airspace Use Plan
VFR	Visual Flight Rules
VOR	Very High Frequency Omnidirectional Range
VORTAC	Combined VOR and TACAN
X	Exit (point)
XLS	excel file

Table 58: Acronyms table

EUROCONTROL

SUPPORTING EUROPEAN AVIATION

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