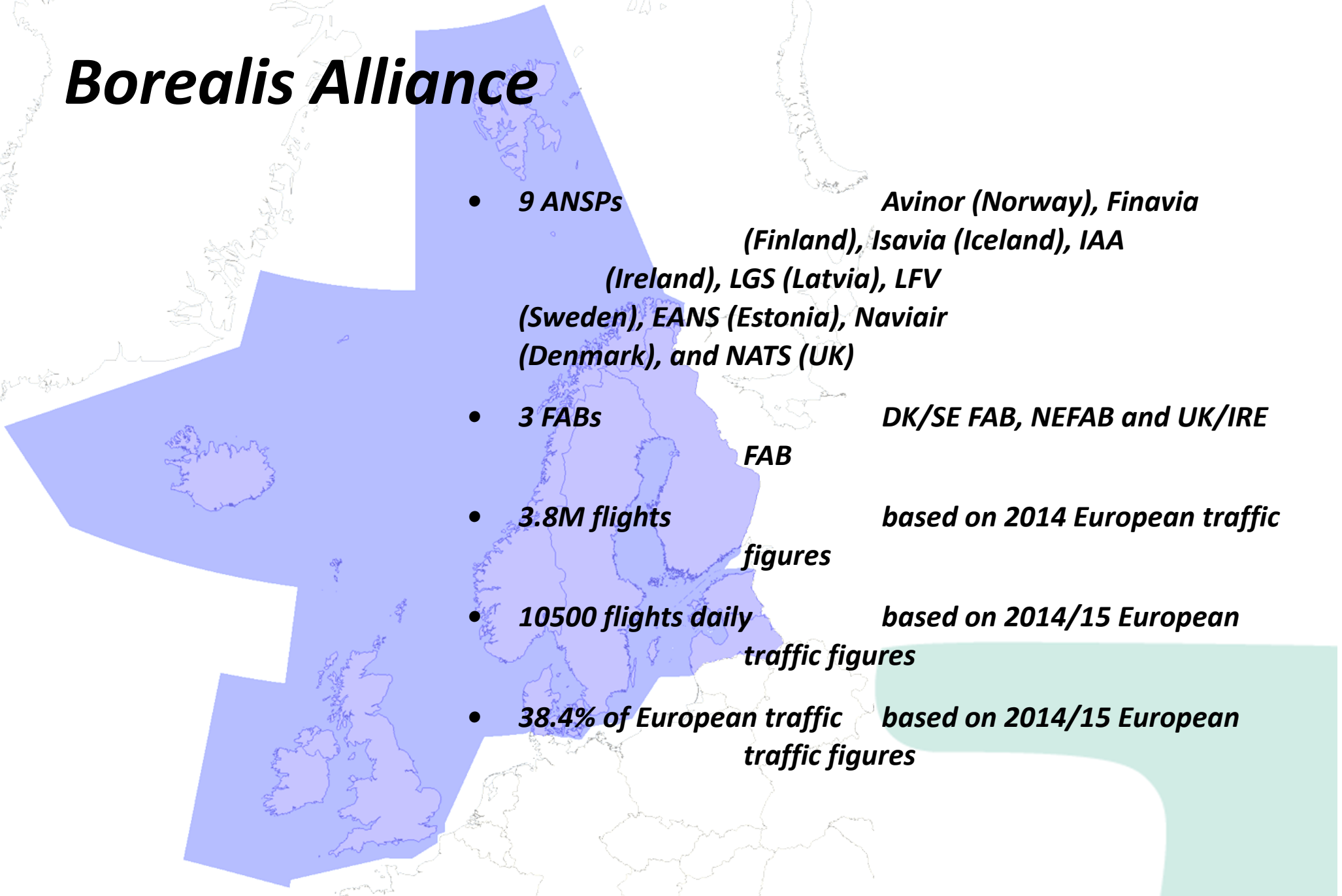
Borealis Free Route Airspace
~ Concept of Operation ~

RNDSG/88 May 2016

Borealis Alliance



- *9 ANSPs* — *Avinor (Norway), Finavia (Finland), Isavia (Iceland), IAA (Ireland), LGS (Latvia), LFV (Sweden), EANS (Estonia), Naviair (Denmark), and NATS (UK)*
- *3 FABs* — *DK/SE FAB, NEFAB and UK/IRE FAB*
- *3.8M flights* — *based on 2014 European traffic figures*
- *10500 flights daily* — *based on 2014/15 European traffic figures*
- *38.4% of European traffic* — *based on 2014/15 European traffic figures*

AVINOR EANS FINAVIA IAA Isavia LFV LGS Latvijas Gaisa Satiksme NATS NAVIAIR

Free Route Airspace (FRA) Programme

- ***Commenced on 1st January 2015 and is expected to run until 2021, when the vision will be realised***
- ***Objective to connect the Free Route Airspace volumes across 9 states seamlessly and with harmonised flight planning rules***
- ***Building on the implementations of FRA by DK/SE FAB, Ireland and NEFAB***
- ***Free Route Airspace is key to the delivery of fuel efficient and environmentally friendly user preferred routings from the eastern part of the North Atlantic to the western boundary of Russian airspace in the North of Europe***
- ***Our aim is to enable airspace users to fly efficient trajectories which can be planned for in advance, allowing savings such as reduced fuel load to be realised***

Borealis Concept of Operation

The overall aim of this Concept of Operation is to provide a framework for the implementation of seamless interfaces between Free Route Airspace volumes of DK-SE FAB, NEFAB, UK Ireland FAB & Iceland.

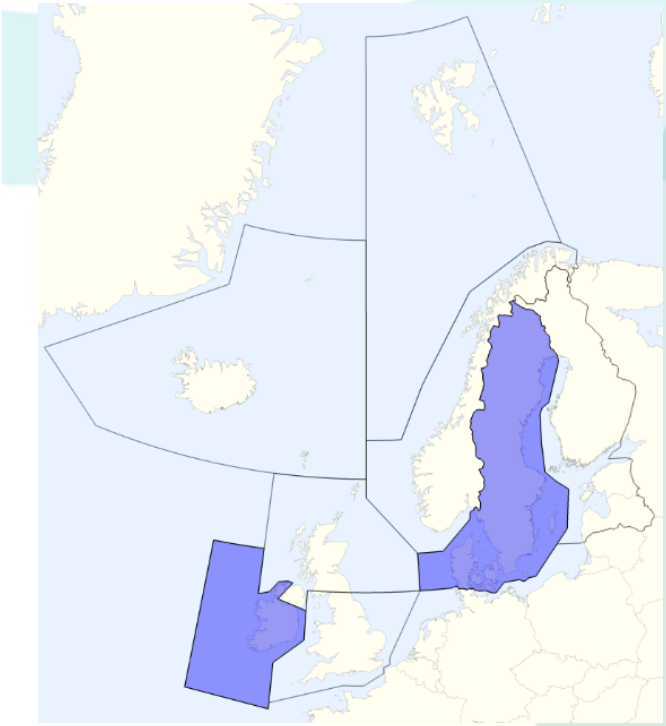
Key objectives;

- ***The FRA shall be available to the airspace users at all times of the day or week***
- ***To enable user preferred trajectories across a very large area regardless of FIR boundaries***
- ***Users will be able to flight plan their preferred trajectories based on harmonised flight planning rules across the nine states***

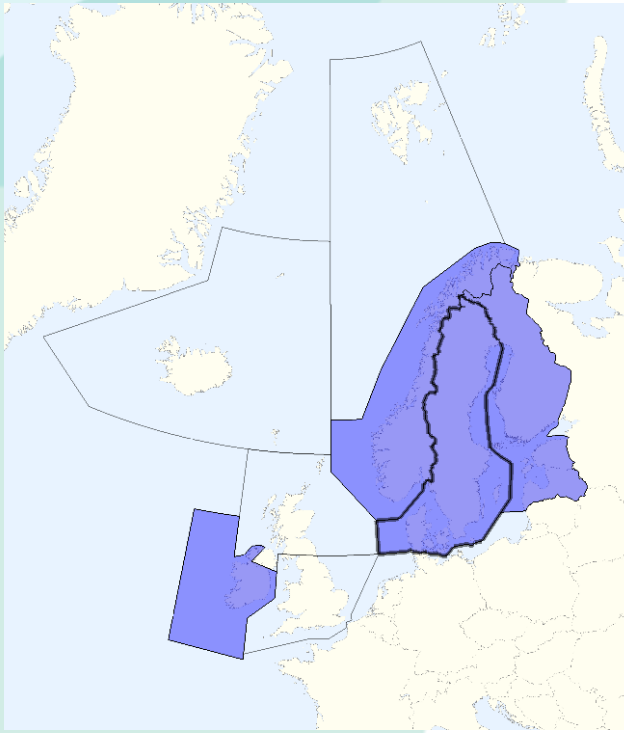
Free Route Airspace (FRA) Programme

INCREMENTAL STEPS TO JOIN EXISTING FRA

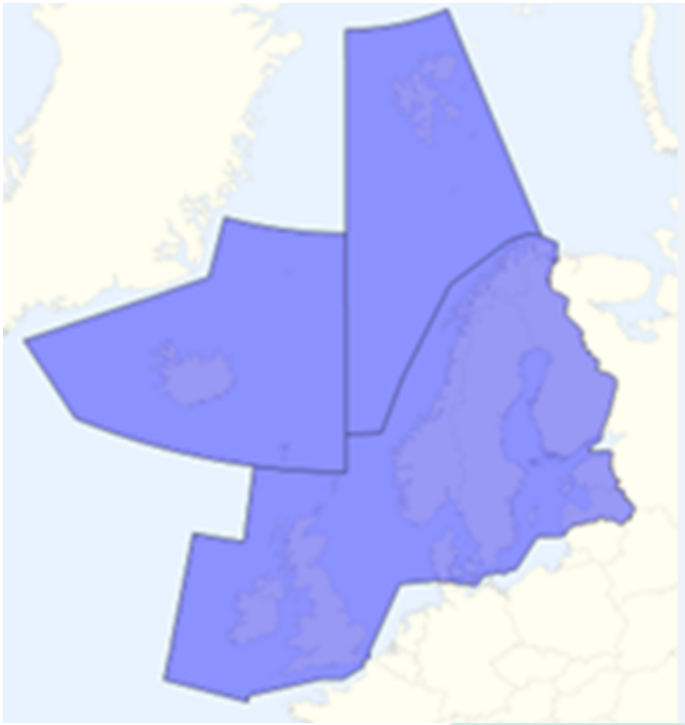
Irish and Danish/ Swedish FAB



NEFAB went live on 12 Nov 2015



Icelandic and UK airspace joining 2016 - 2021



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Free Route Airspace (FRA) Programme

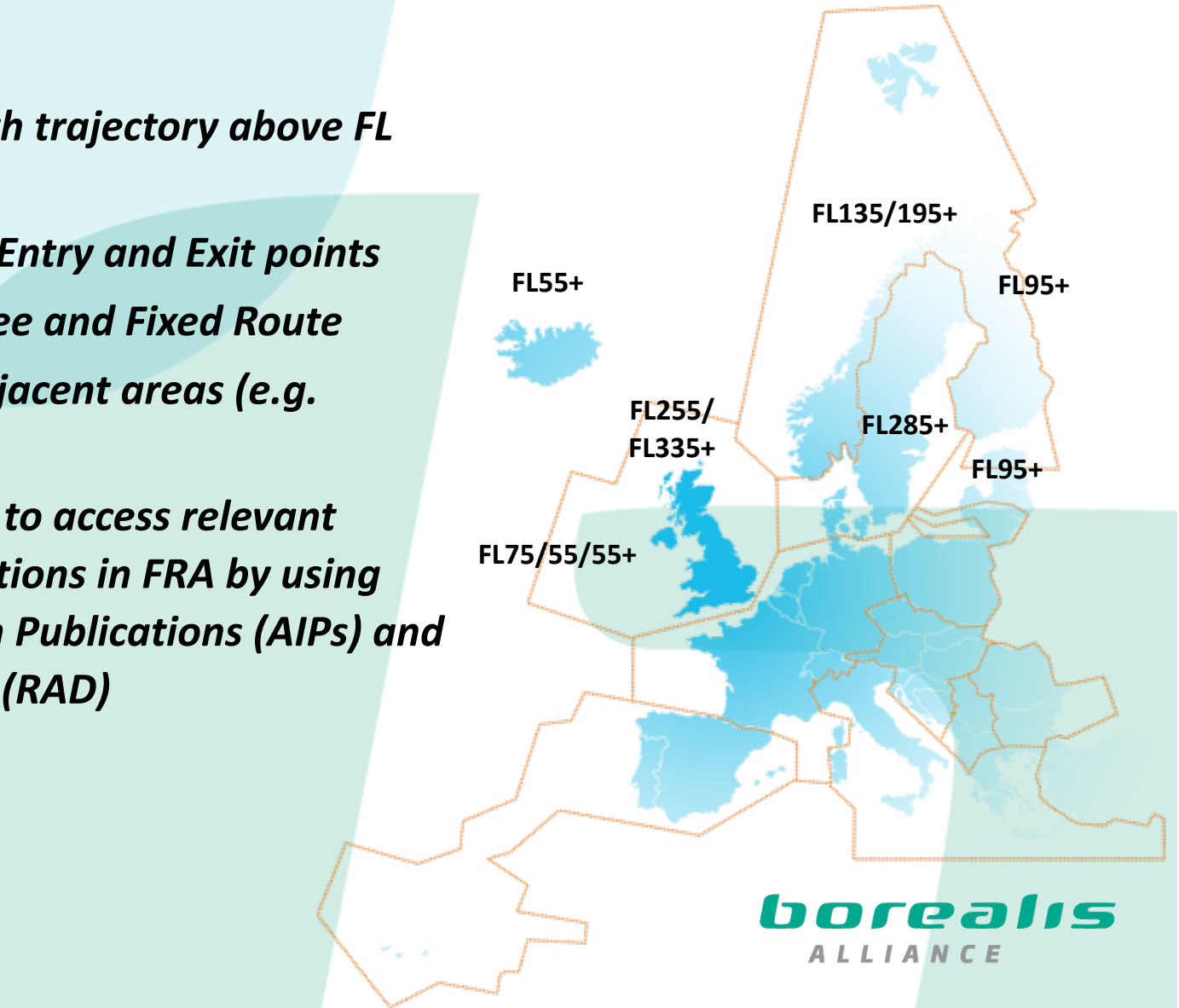
- Seven implementation steps 2016 – 2021

ID	Step Lead	Step	Affected ANSPs	Planned
S1	IAA	Extension of FRA in Shannon FIR down to FL75	None	2016
S2	Isavia	FRA for flights departing/arriving within Reykjavik FIR via Norway/Bodø FIRs	Avinor Implementation projects	
S3	Isavia	FRA for flights departing/arriving within Reykjavik FIR via Scottish FIR	NATS Implementation projects	
S4	NATS	Implementation of FRA in seven Scottish FIR sectors	Avinor/IAA/Naviair/Isavia Implementation projects	2017
S5	Isavia	FRA for all flights transiting via Norway/Bodø and Scottish FIRs	Avinor/NATS Implementation projects	2017
S6	NATS	Full implementation of FRA in Scottish FIR and in parts of London FIR	IAA/Naviair Implementation project	2020
S7	NATS	Full implementation of FRA in London FIR	IAA Implementation project	2021

Scope

The following represents the scope of the Borealis FRA concept of operation:

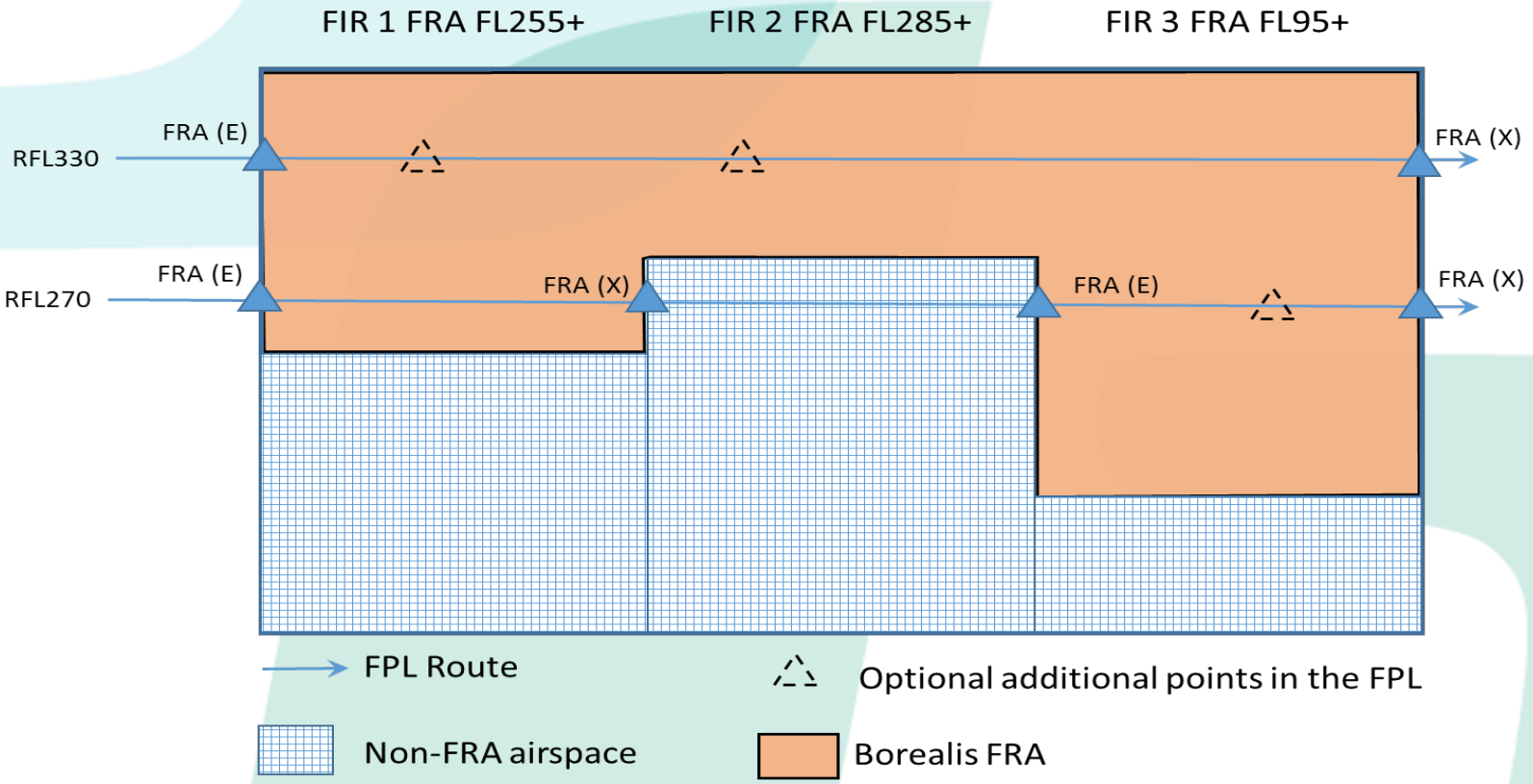
- *Eligible flights are those with trajectory above FL listed*
- *Defined set of Borealis FRA Entry and Exit points*
- *Transition rules between Free and Fixed Route*
- *Maintain connectivity to adjacent areas (e.g. FABEC, Baltic FAB)*
- *Airspace users shall be able to access relevant information related to operations in FRA by using the Aeronautical Information Publications (AIPs) and Route Availability Document (RAD)*



How to flight plan

Overflights:

- *From a FRA Entry Point to a FRA Exit Point*
  - *Flight plan DCT or via one or several points (such a point can either be a NAVAID published in ENR 4.1, a significant point published in ENR 4.4 or a Lat/Long coordinate)*



ATM system issues in Large FRA Areas

Large FRA areas

- ***With further developments of large FRA areas (possibly multi FAB) very long flight planned segments without additional waypoints are expected to occur. This will affect not only participating States but also the adjacent one/s.***

This has a potential effect on:

- ***Size of system area, affects both the ATC systems within the FRA area as well as adjacent systems pending on architecture;***
- ***Number of points to be managed, affects both the ATC systems within the FRA area as well as adjacent systems pending on architecture;***
- ***Trajectory calculation, affects both the ATC systems within the FRA area as well as NM systems.***

Departing/Arriving Traffic

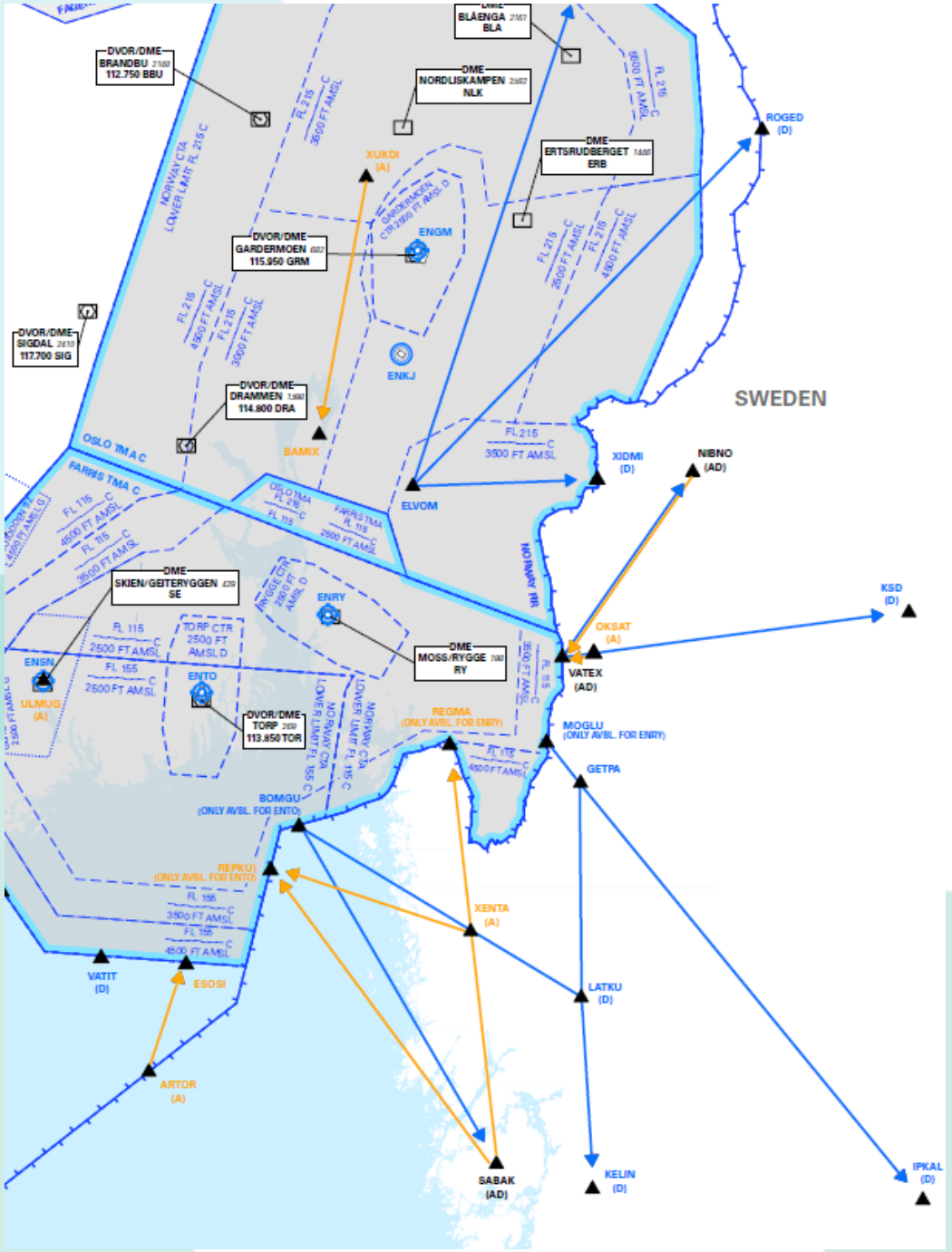
Access to FRA for departing/arriving traffic is via a FRA Departure/Arrival Transition Point. Depending on the aerodrome there are different requirements as described in AIPs and/or RAD:

- ***a SID/STAR Final Waypoint,***
- ***a specific connecting point linked to an aerodrome according to the RAD Appendix 5 or AIP Iceland,***
- ***if required, the last/first point on a FRA Transition Route as described in ENR 3.5,***
- ***if no suitable SID/STAR is available or there is no requirement for a connecting point; a NAVAID or significant point within a required distance from the aerodrome according to the RAD Appendix 5 or AIP Iceland,***
- ***a FRA Entry Point if departing from/arriving to an aerodrome in the proximity of a Borealis FRA volume.***

FRO starts/ends at a(n) Departure/Arrival Transition Points regardless of altitude at the point. The Transition Point is a geographical position, not an altitude!

Example

- *Traffic arriving / departing FARRIS TMA (ENRY, ENTO)*



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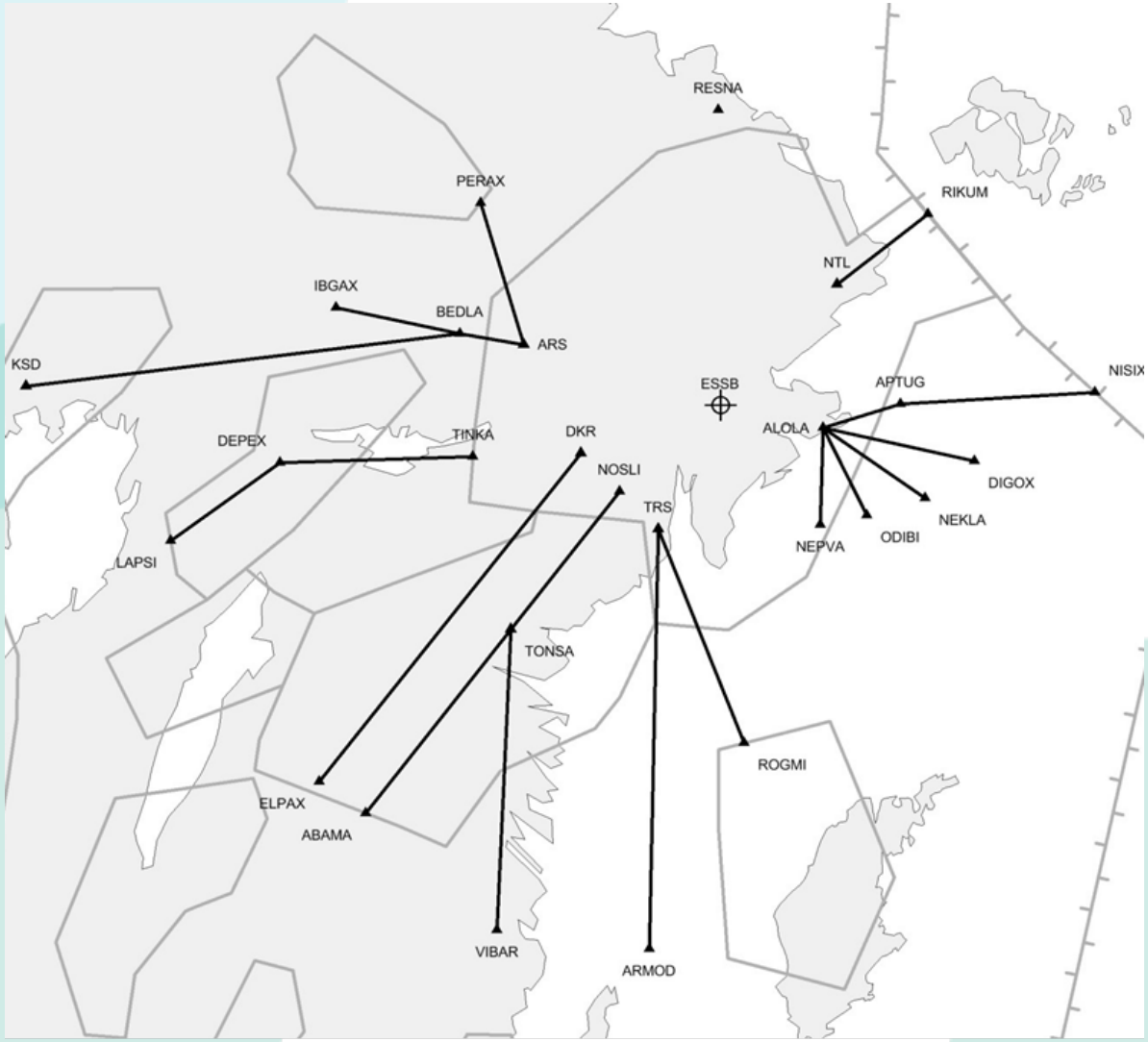
Example

- *Traffic departing Stockholm Bromma (ESSB)*



- *A corresponding chart for arriving traffic is also published in ENR 3.5*

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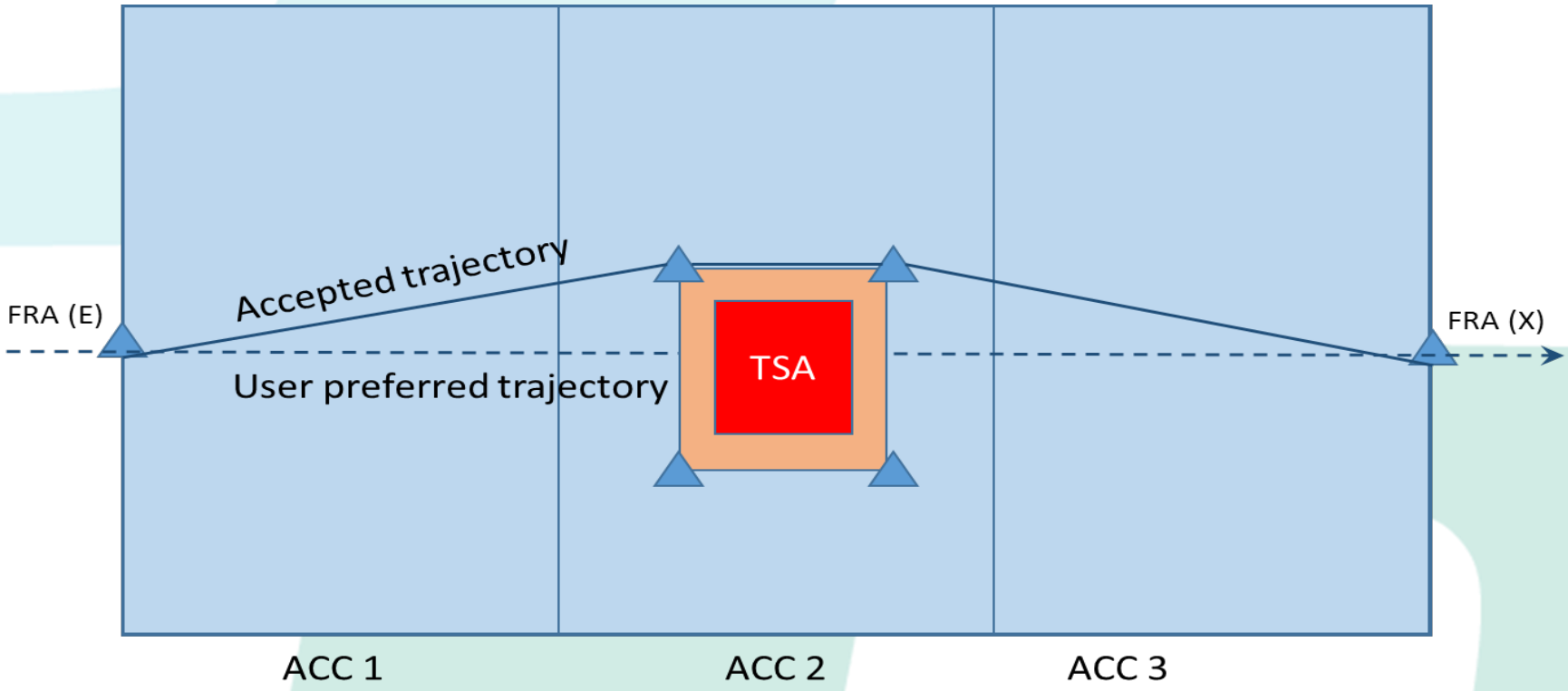
ASM

When a booking is received for an AMC Manageable Area (AMA) the airspace is blocked by IFPS. Any trajectory filed through this airspace will be rejected and a revised flight plan avoiding the area will need to be submitted.



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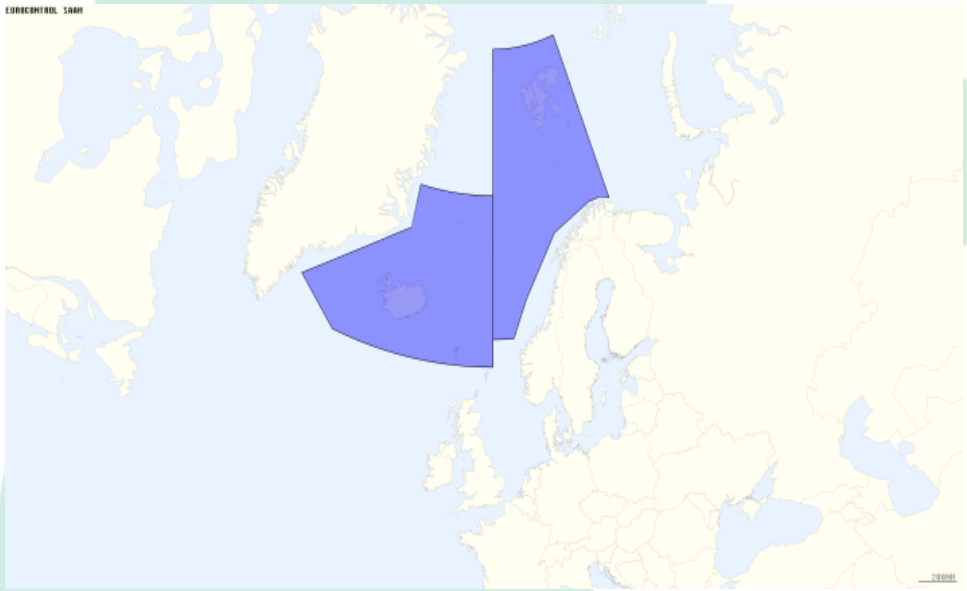
Flight planning within the NAT region

2016 -Traffic arriving and departing airports within Reykjavik FIR and exiting/entering European region may flight plan directly between TMA entry/exit (transition) points and the EUR entry/exit points (i.e. significant points on Norway FIR and Scottish FIR boundary).

2017 - FRA operation east of Iceland for all flights transiting from/to Reykjavik FIR and Bodo, Norway and Scottish FIRs.

Note: The general NAT Doc 7030 flight planning requirements will still apply



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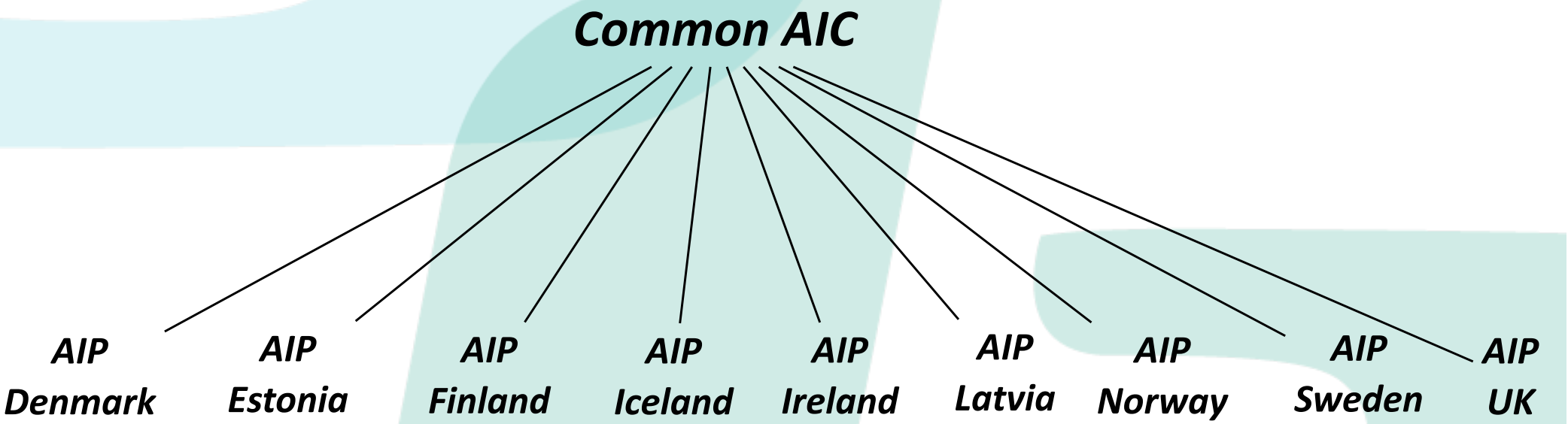
Publication

- *Each state/FAB will publish their own data in AIP but in a harmonized way*
- *A generic overview of Borealis FRA will be published via a common AIC*



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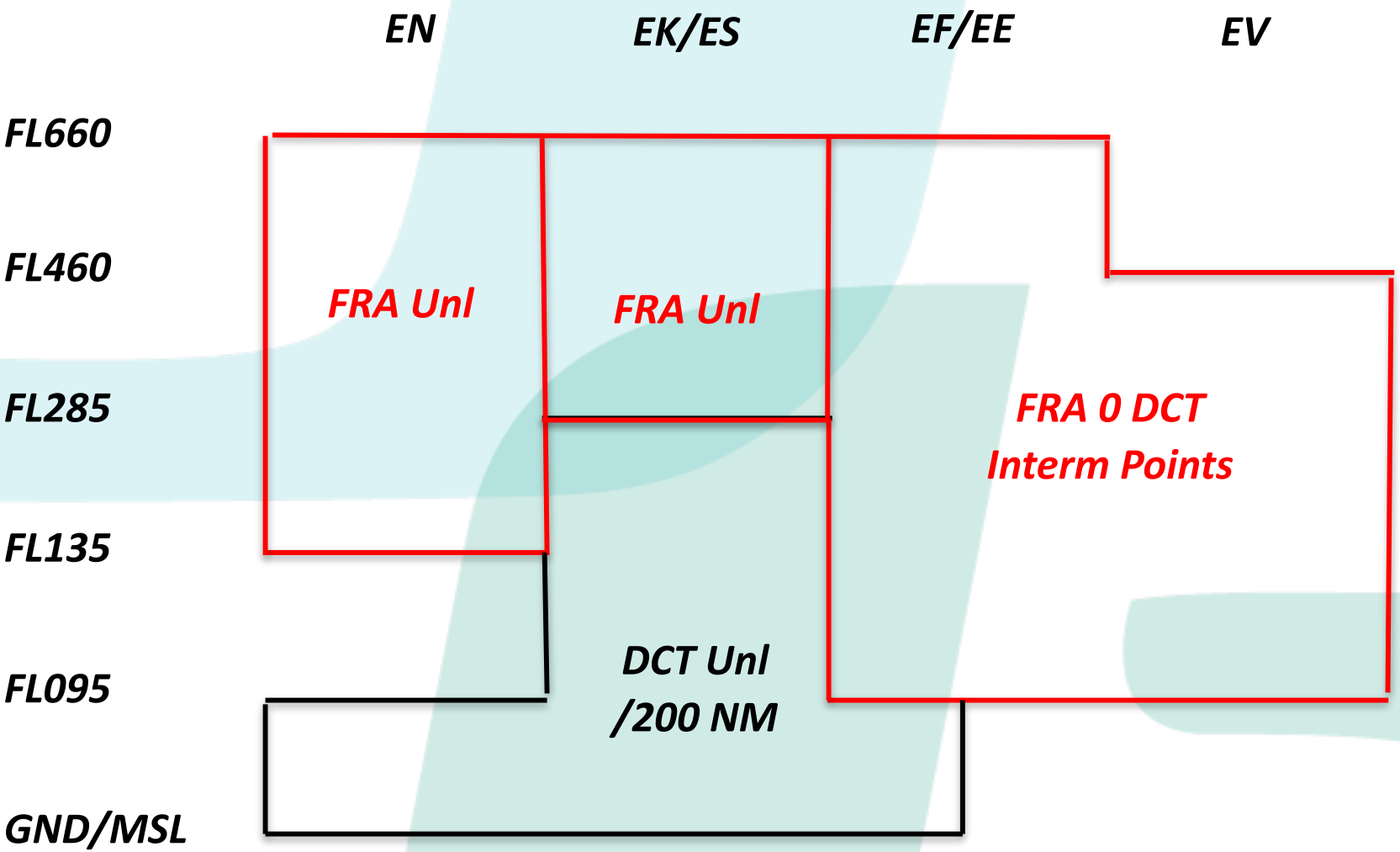
Present environment with NEFRA Scenario 6



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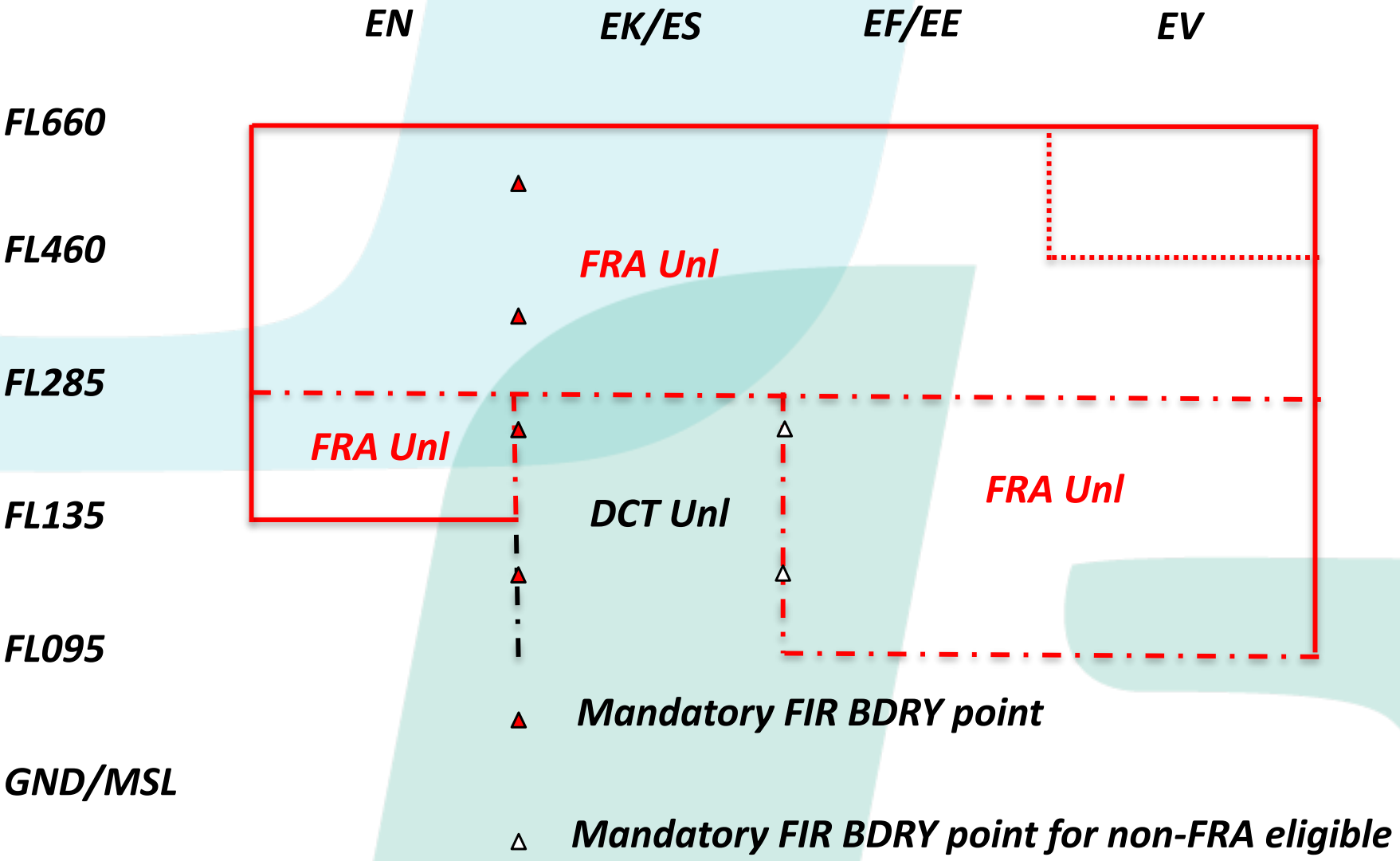
	Scenario 6	Scenario 8
GND – FL095	BDRY open •No problem	BDRY open •No problem
FL095 - FL285	BDRY clsd •Correct according to concept •Problems with transit through delegated airspace	BDRY clsd •Correct according to concept for over-flights below FL285 •Problems with transit through delegated airspace •Not correct according to concept for arr/dep traffic which are FRA eligible and x-ing BDRY between DK-SE FAB and NEFAB
FL285 – FL660 (FL460)	BDRY clsd •Correct according to concept •Problems with transit through delegated airspace	BDRY open •No problem

Common FRA Area Unl DCT FL285-660 (460) from 23rd of June



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Thank you very much for your participation!

Any questions?

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