

# NEFAB

north european functional airspace block

## NEFAB Target Concept 2015

Customer Consultation Day,

Helsinki 2014 10 21

Oslo 2014 10 23

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## List of contacts – the speakers and facilitators

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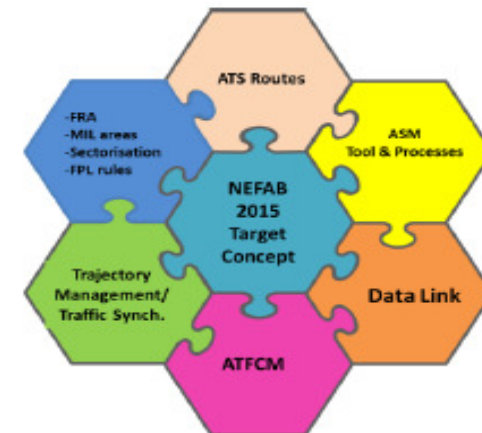
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## NEFAB 2015 Target Concept

- ▲ NEFAB Concept of Operations (CONOPS) – basis for in-depth studies and concept development
- ▲ The NEFAB Network Plan
  - provides an elaboration and adaption of the NEFAB 2015 target concept
  - shall secure a harmonized, synchronized and timely implementation of the FAB concept of operations to be implemented and fully functional in November 2015
- ▲ The target concept is built on individual modules which to a large degree are interrelated
- ▲ The Target Concept is in line with European development (ATM Master Plan, Network Strategy Plan, ESSIP Plan and Interim Deployment Plan)



## NEFAB 2015 Target Concept

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- ▲ Enable **users preferred trajectories** and a more flexible and efficient use of the airspace
- ▲ **ATS-route network maintained** and enhanced to create quick-wins and ensure connectivity to the Free Route Airspace, airports and neighboring areas
- ▲ Users will be able to flight plan their preferred trajectories based on **common NEFAB FRA flight planning rules**
- ▲ **Sectors will be adapted to accommodate the changes in traffic flows** and enhance capacity. Cross-border sectors will be introduced where required.
- ▲ **The military airspace structures re-designed as required** to accommodate FRA traffic flows and military user requirements.
- ▲ **ASM procedures to be harmonised.** Implementation of **LARA ASM-tool. Flight Plan Buffer Zone Methodology (FBZ)** to be introduced.



## NEFAB 2015 Target Concept

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- ▲ **ATFCM processes through national FMPs will be maintained** in the 2015 concept. Sector configurations will be updated in real-time to the Network Manager
- ▲ **Automated flight coordination and ATM-system interconnectivity enhancements** will enable safe and efficient ATS-provision in FRA-environment
- ▲ **Data link implementation** in two phases. The first phase will fulfill the EC Implementation Rule. In the second phase the NEFAB data link area and services will be extended to enhance safety and increase capacity (pending EC review)
- ▲ **Rules, regulations and ATC-procedures adapted** to support the NEFAB 2015 target concept



## Airspace Management (ASM)

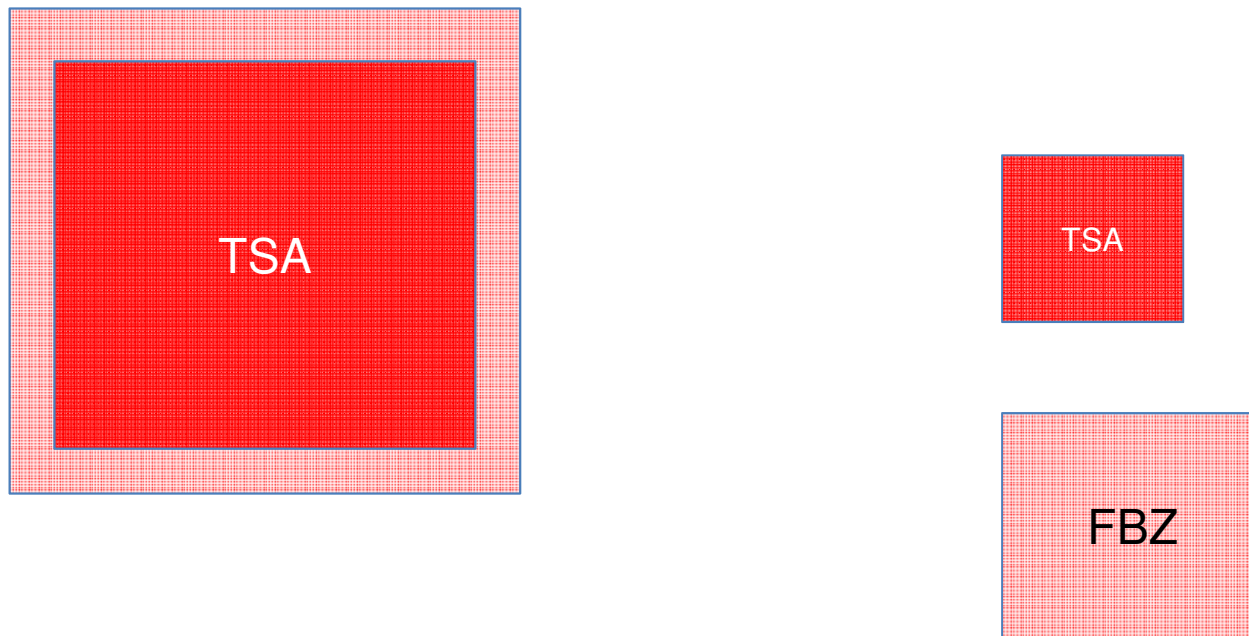
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- Some military airspace structures are being re-designed and positioned to minimize the effect to the civil traffic while accommodating the MIL requirements.
- Airspace and military issues are a matter of sovereignty of the individual states. Priority rules are therefore set at state level
- Flight Planning Buffer Zones (FBZ) around areas will be defined – DCT trajectories that get too close to areas are blocked by the NM (IFPS)

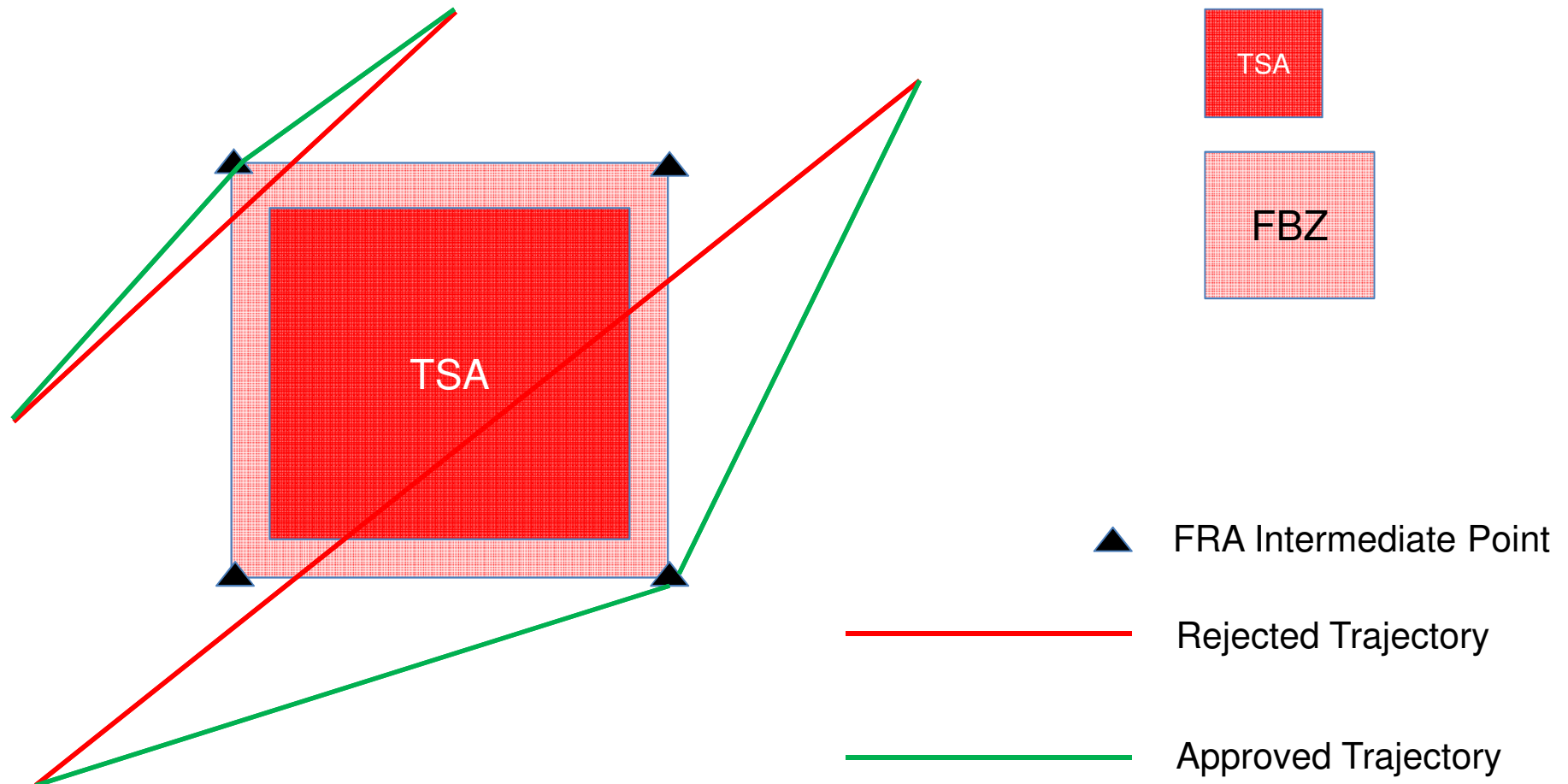


# Flight Plan Buffer Zone Methodology

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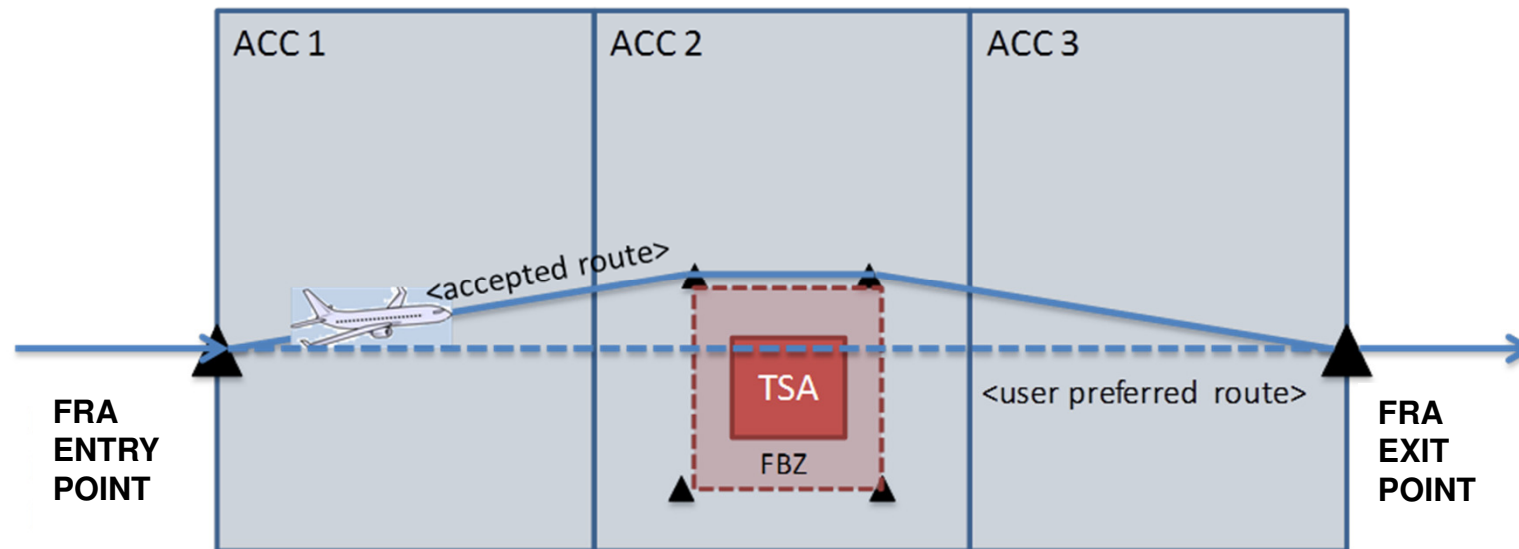


# Flight Plan Buffer Zone Methodology





# NM (IFPS) Flight Plan Checking



## Airspace reservation process

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- At D-1 military informs their request.
- AMC makes the Airspace Use Plan (AUP).
- AUP lists all the TSA's that will be active (time/flight levels).
- NM (IFPS) checks the FPL's and rejects if the trajectory penetrates the FBZ.
- If reservations change, an Updated Use Plan (UUP) will be issued.
- ATC can tactically shorten the route if possible (eg. TSA not yet active).



## Free Route Airspace - definition

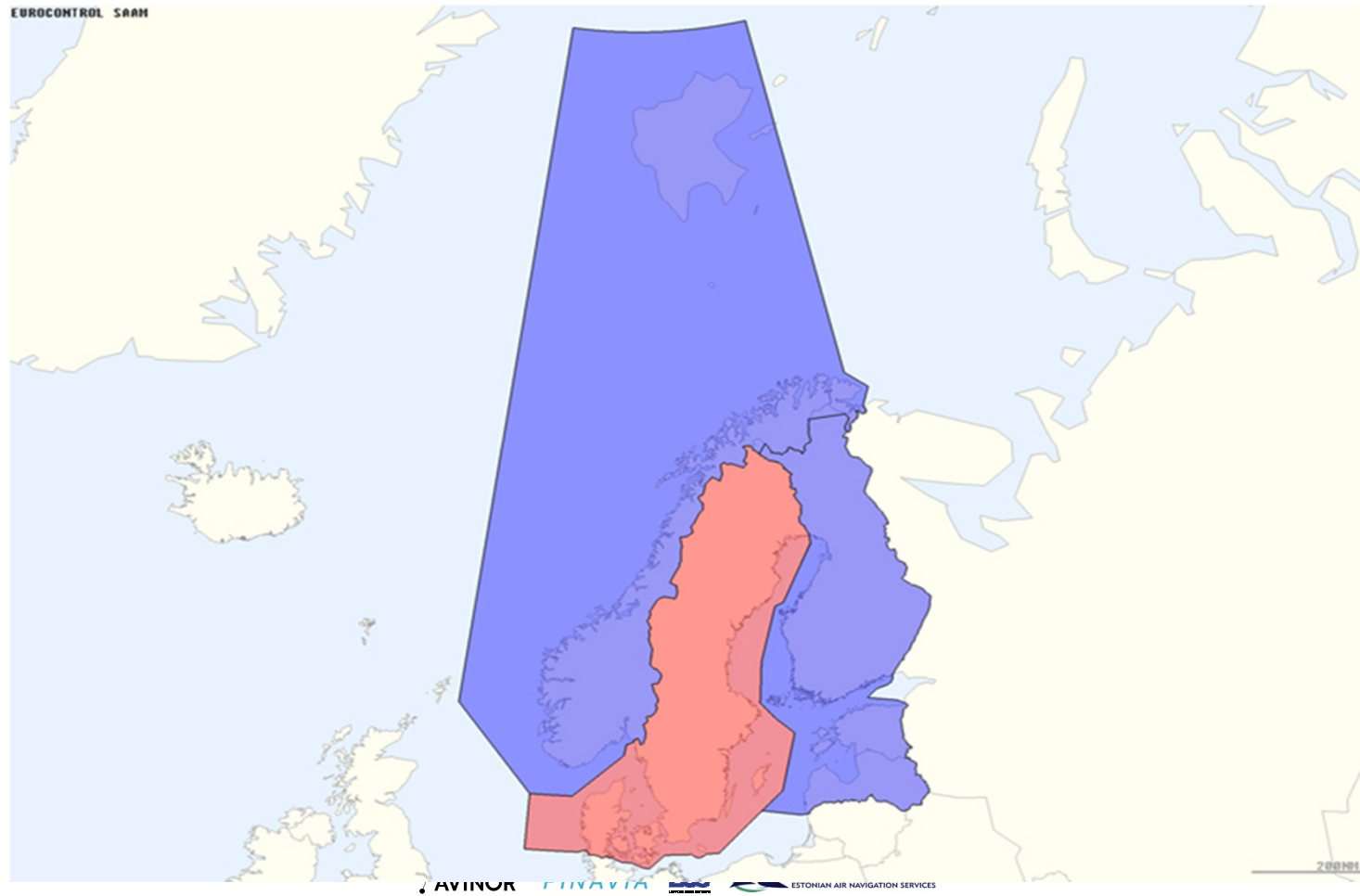
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A specified airspace within which users may freely plan a route between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) waypoints, without reference to the ATS route network, subject to airspace availability.

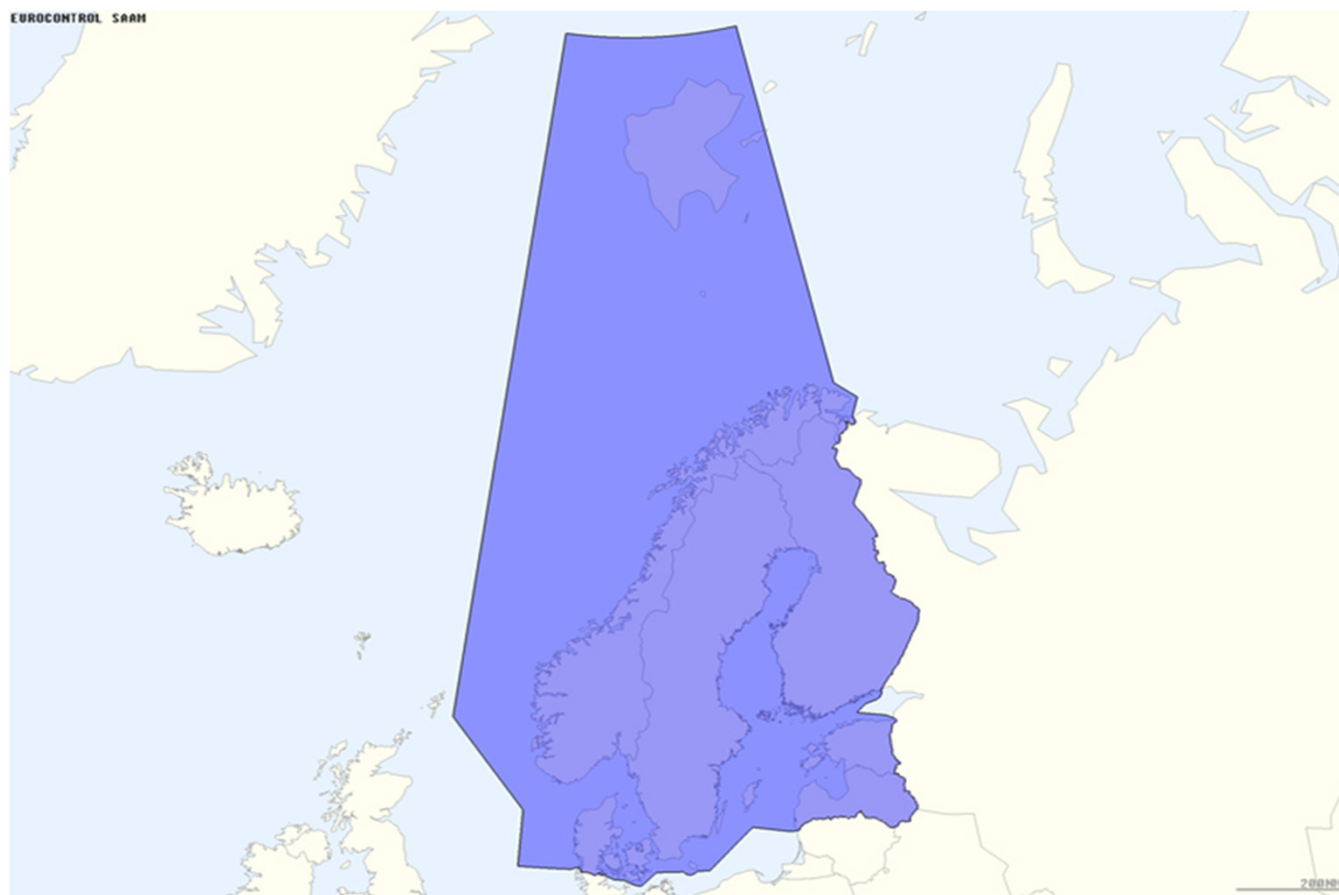
Within this airspace, flights remain subject to air traffic control.

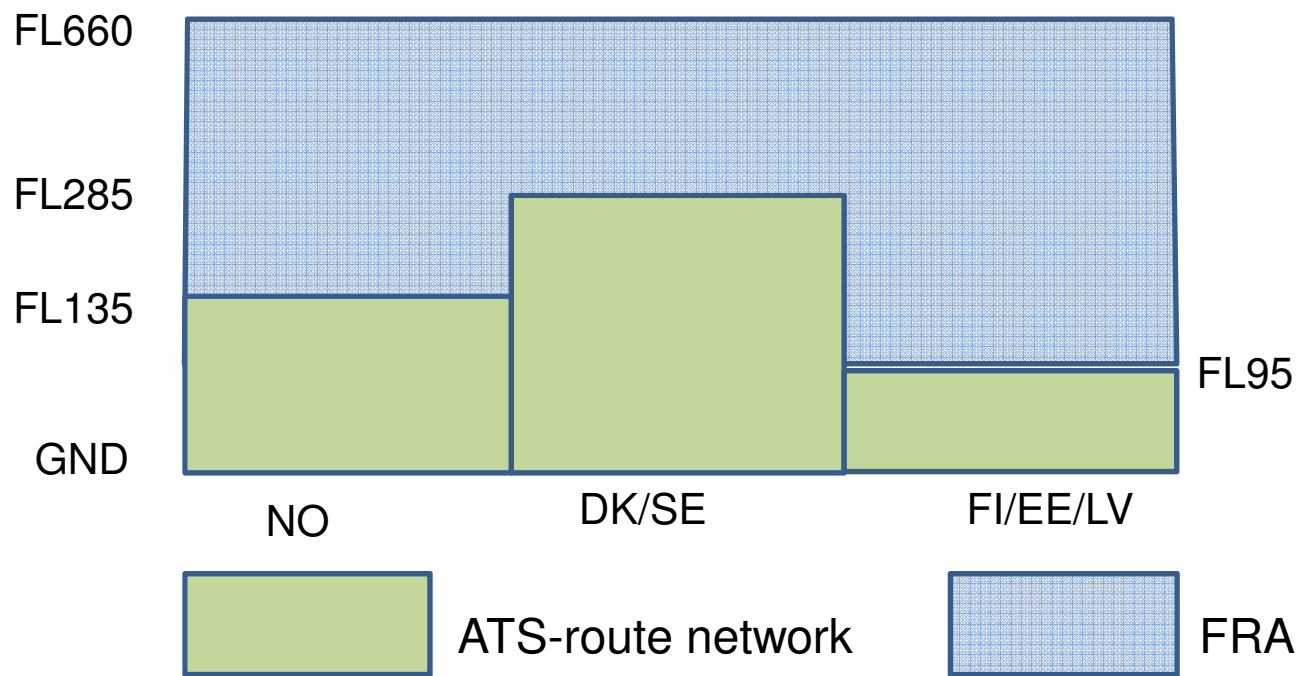


# FRA below FL285

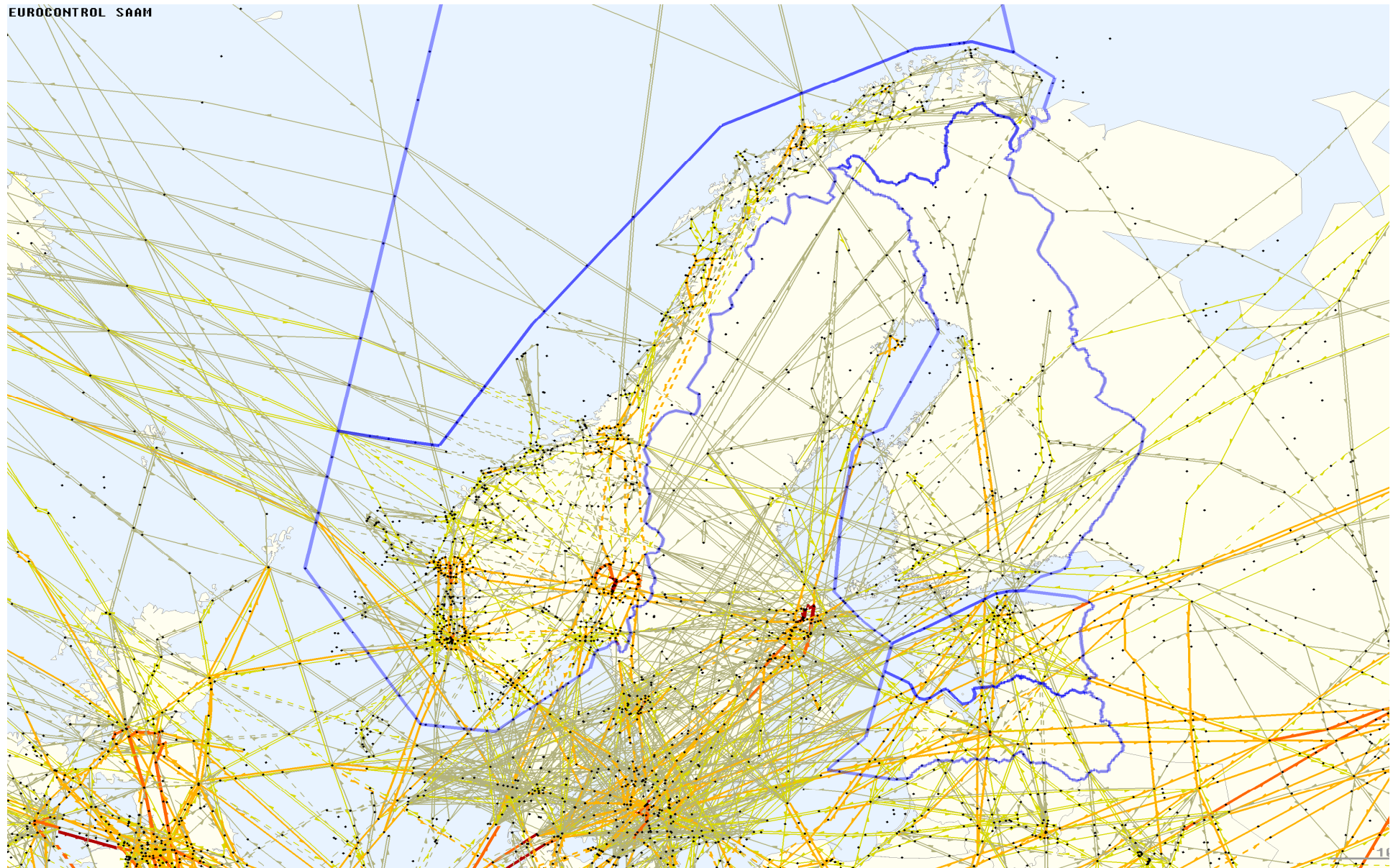


## FRA above FL285

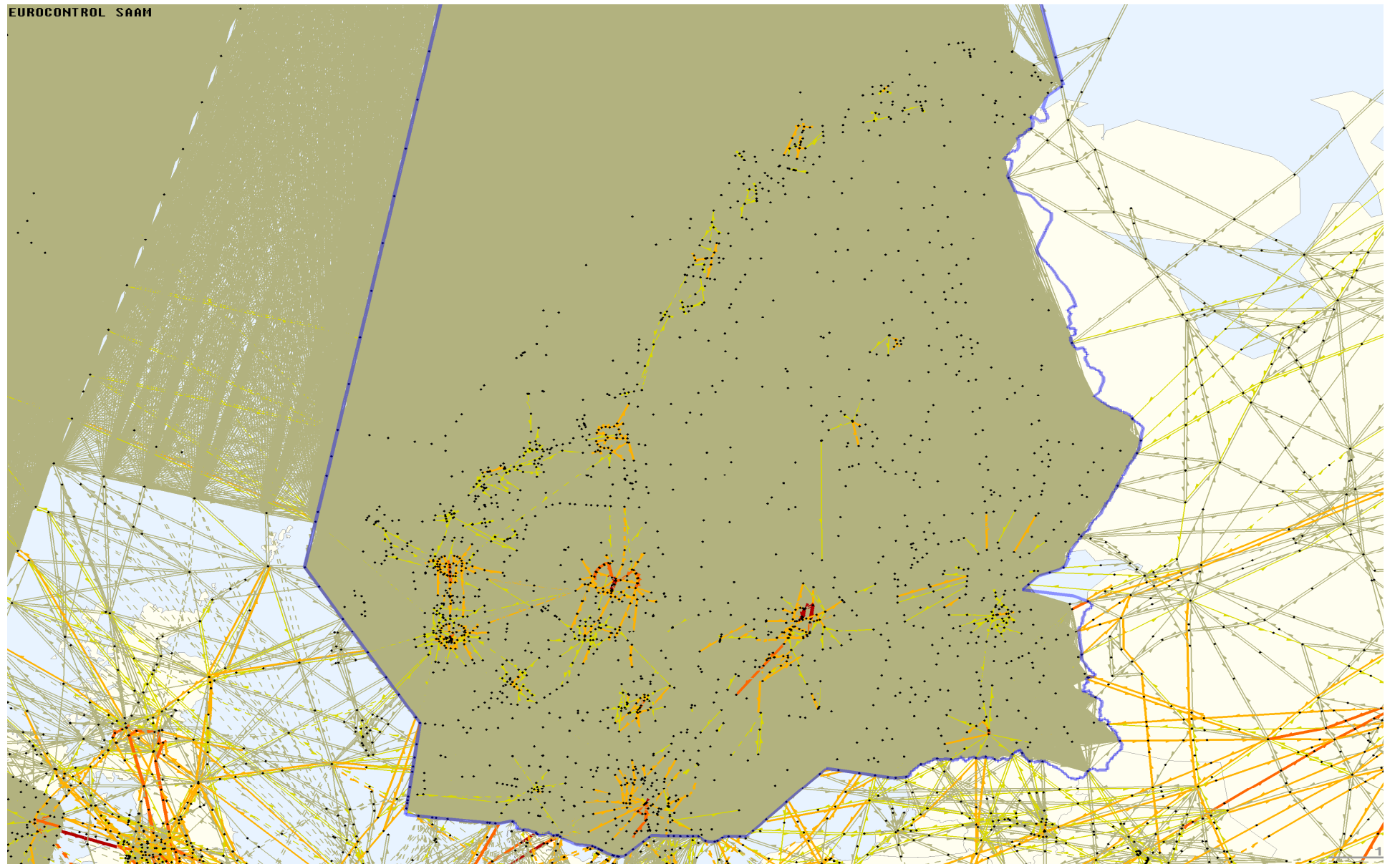




EUROCONTROL SAAM

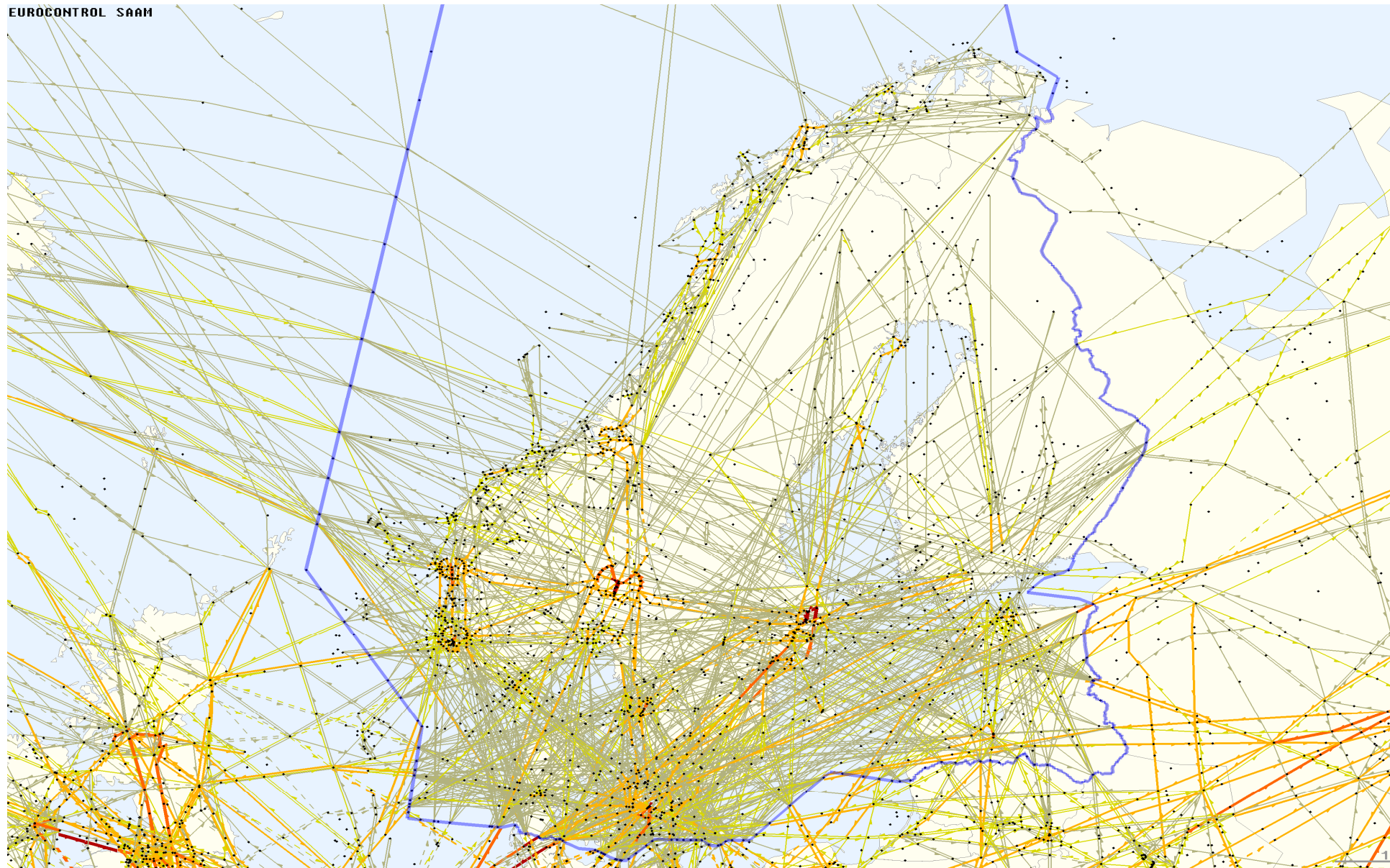


EUROCONTROL SAAM







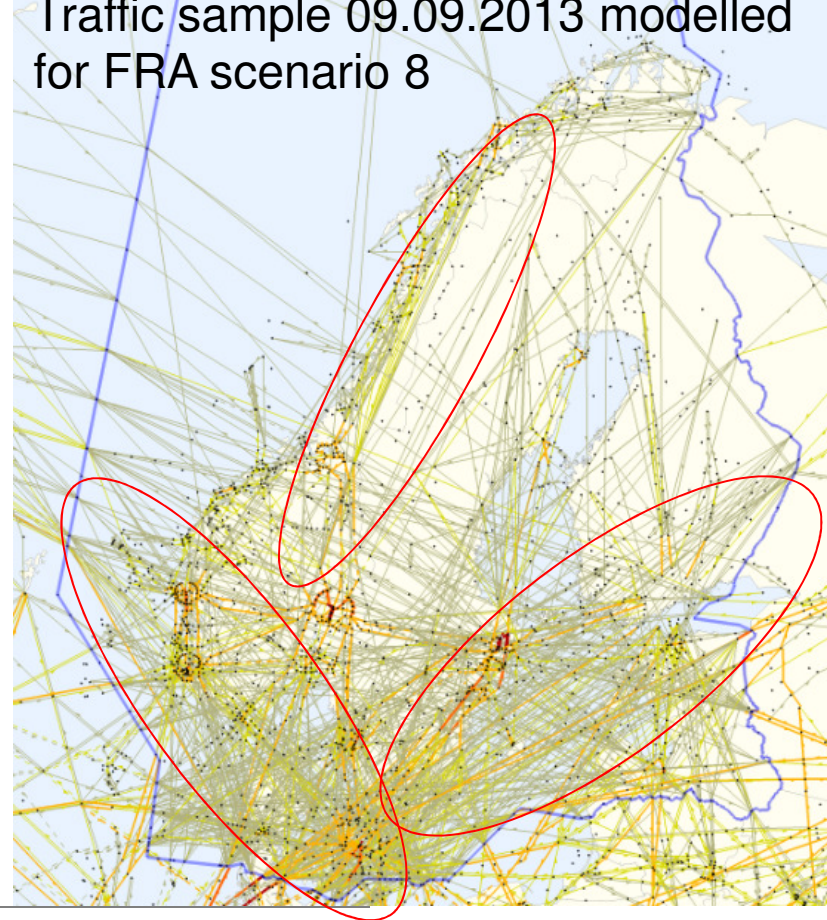


## Effects - Before and after

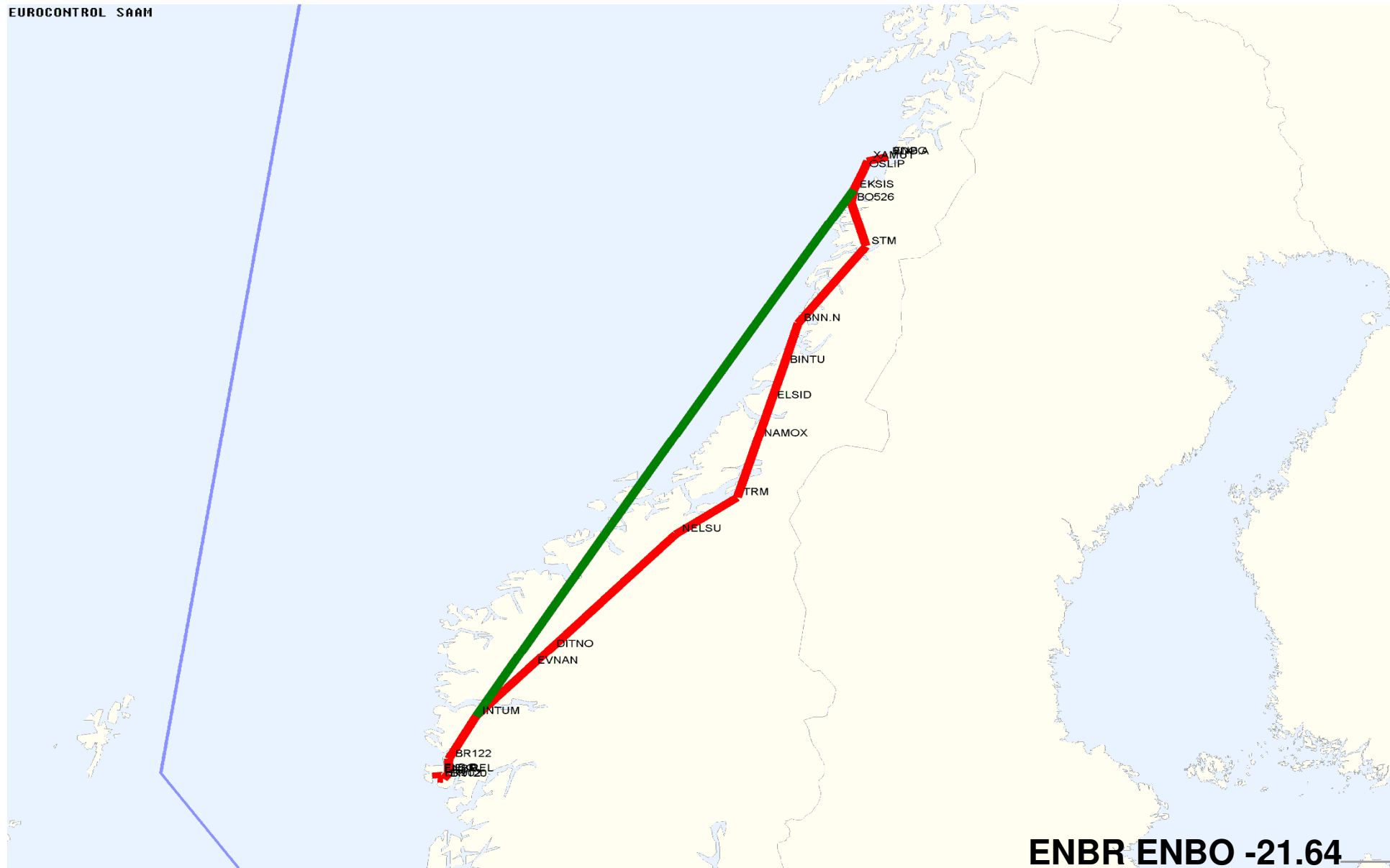
Reference traffic sample 09.09.2013



Traffic sample 09.09.2013 modelled for FRA scenario 8



EUROCONTROL SAAM



ENBR ENBO -21.64

EUROCONTROL SAAM

%6600

ABADA

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TOGMI

DOBAN

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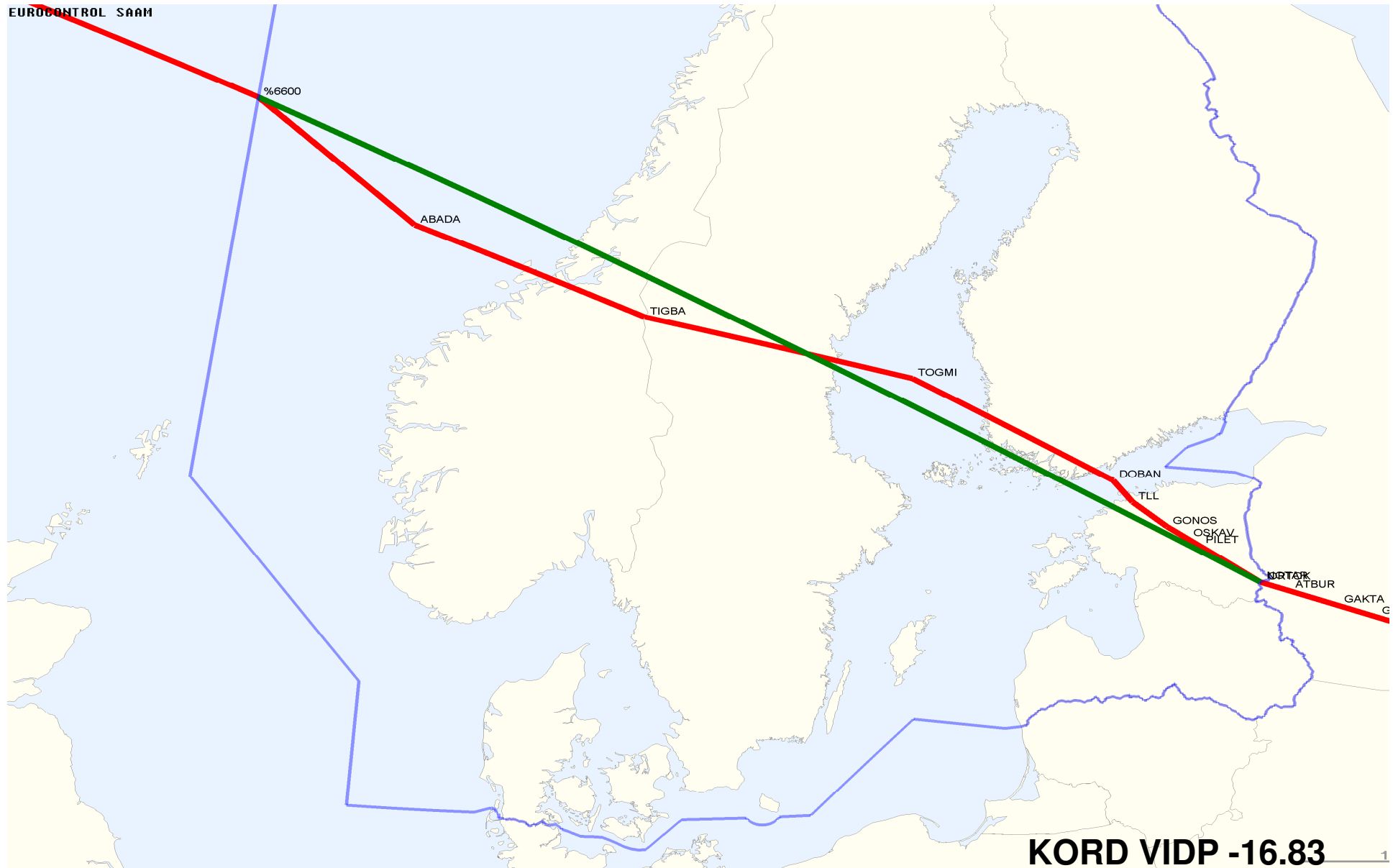
GONOS  
OSKAV  
PILET

ORTAK  
ATBUR

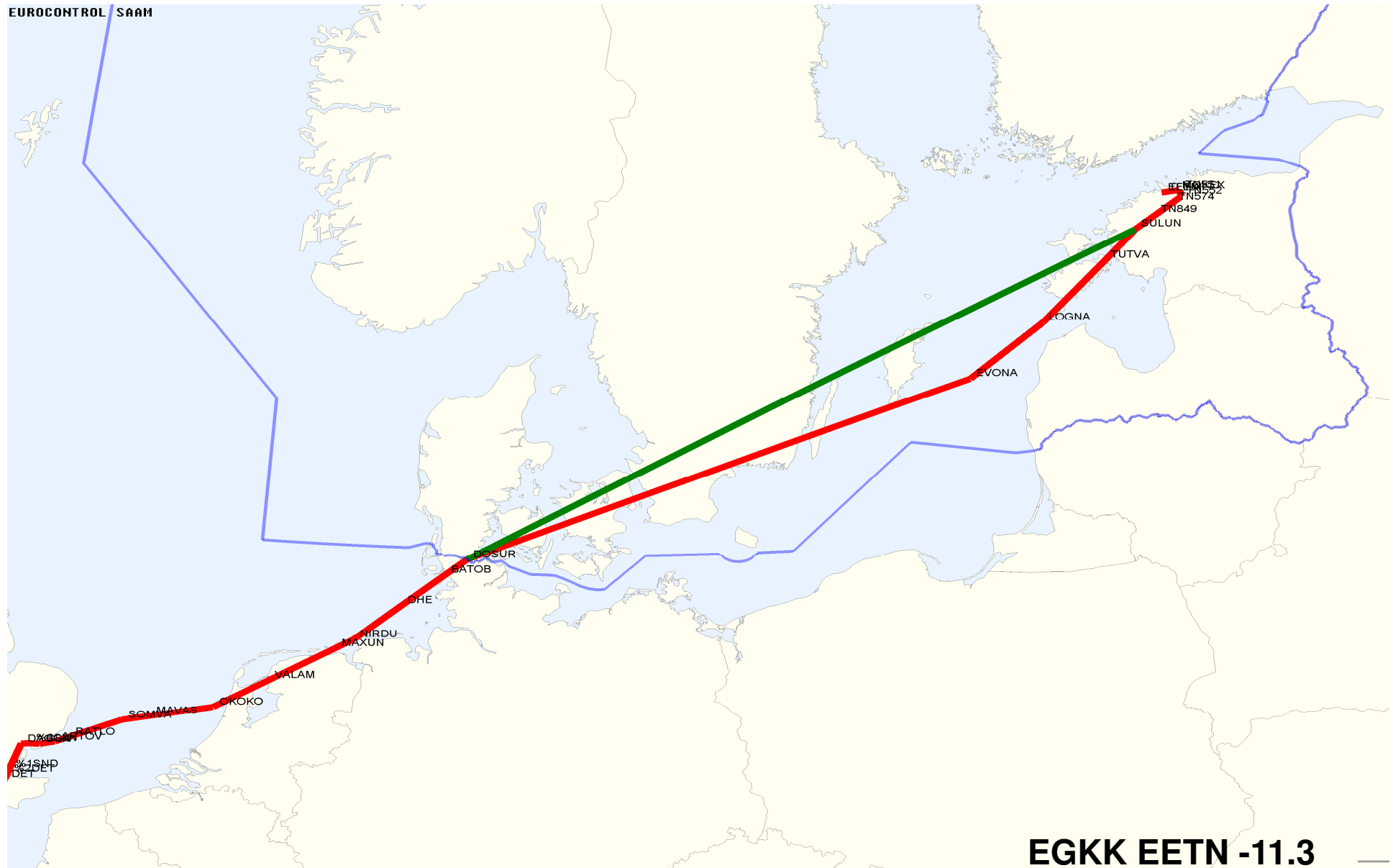
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KORD VIDP -16.83

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EUROCONTROL SAAM



EGKK EETN -11.3

## Flight planning rules in Free Route Airspace

- If the planned trajectory takes the flight into the Free Route Airspace the flight is eligible for user preferred routing in controlled en-route airspace.
- In user preferred routing, the route may contain any significant points, NAV aids or lat/longs and DCT between these points.
- Special conditions apply when arriving and departing to/from an aerodrome.



## Free Route eligible flights - NEFAB

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Eligible flights are those that have planned trajectory above:

- FL 95 in Finland, Estonia and Latvia
- FL 135 in Norway
- FL 195 in Bodö oceanic





## Free Route eligible flights – NEFAB and DK/SE FAB common FRA

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Eligible flights are those that have planned trajectory above FL285

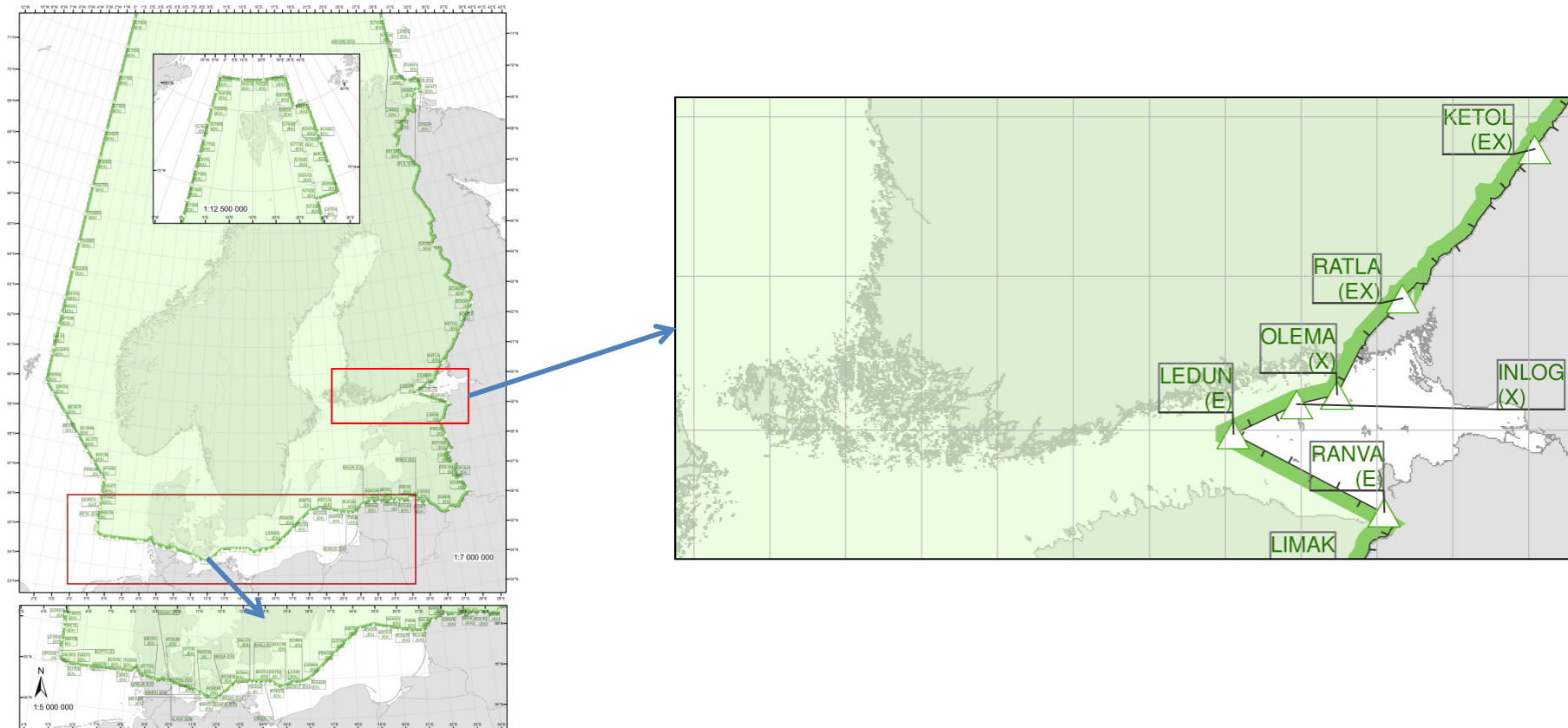


## Flight planning rules

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From	To	Remark
FRA Entry Point (E)	FRA Exit Point (X).	Flight plan DCT or via one or several additional points.  Such an additional point can be either a NAV aid/waypoint or entered as lat/long coordinates.
	FRA Arrival Transition Point (A).	
	FRA Intermediate Point (I).	
FRA Departure Transition Point (D)	FRA Exit Point (X).	
	FRA Arrival Transition Point (A).	
	FRA Intermediate Point (I).	
FRA Intermediate Point (I)	FRA Exit Point (X).	
	FRA Arrival Transition Point (A).	
	FRA Intermediate Point (I).	

# Entry and Exit FRA



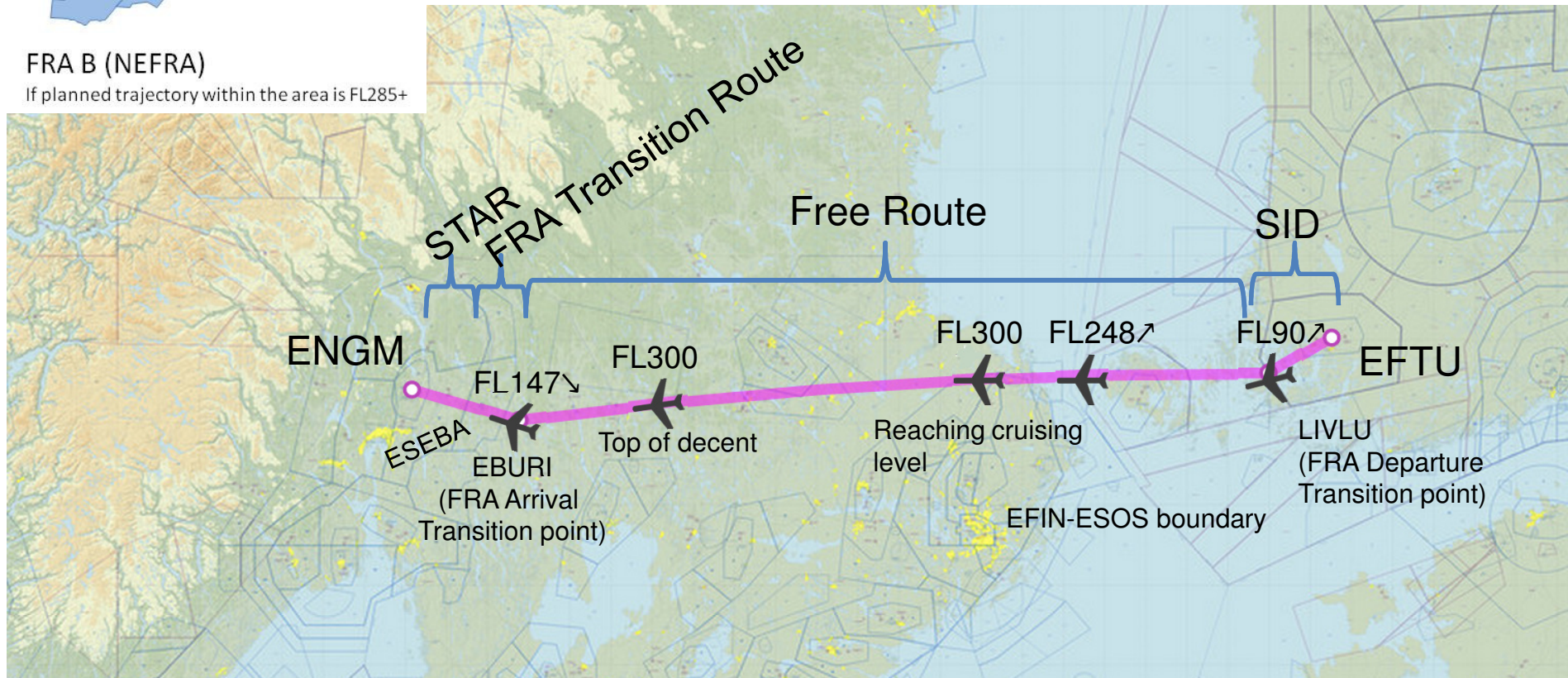


FRA B (NEFRA)

If planned trajectory within the area is FL285+

Flight planning example:

EFTU – ENGM FL300

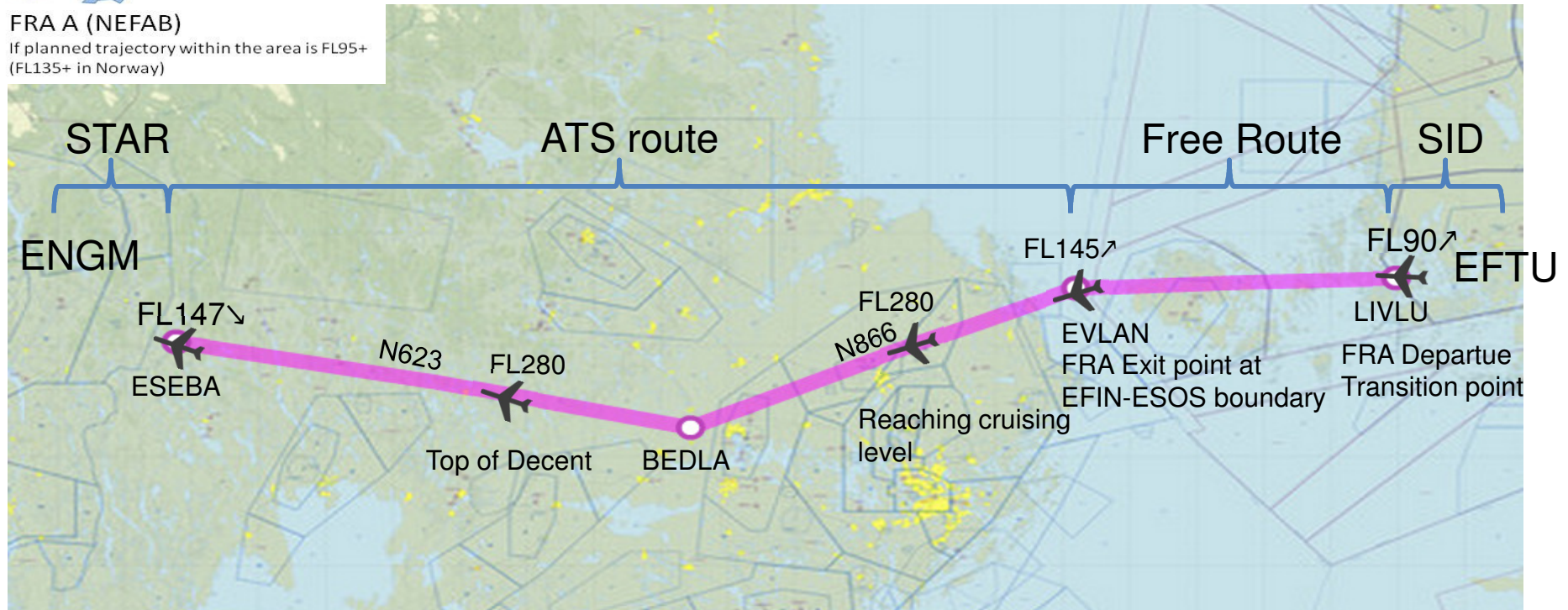


# Flight planning example:

## EFTU – ENGM FL280



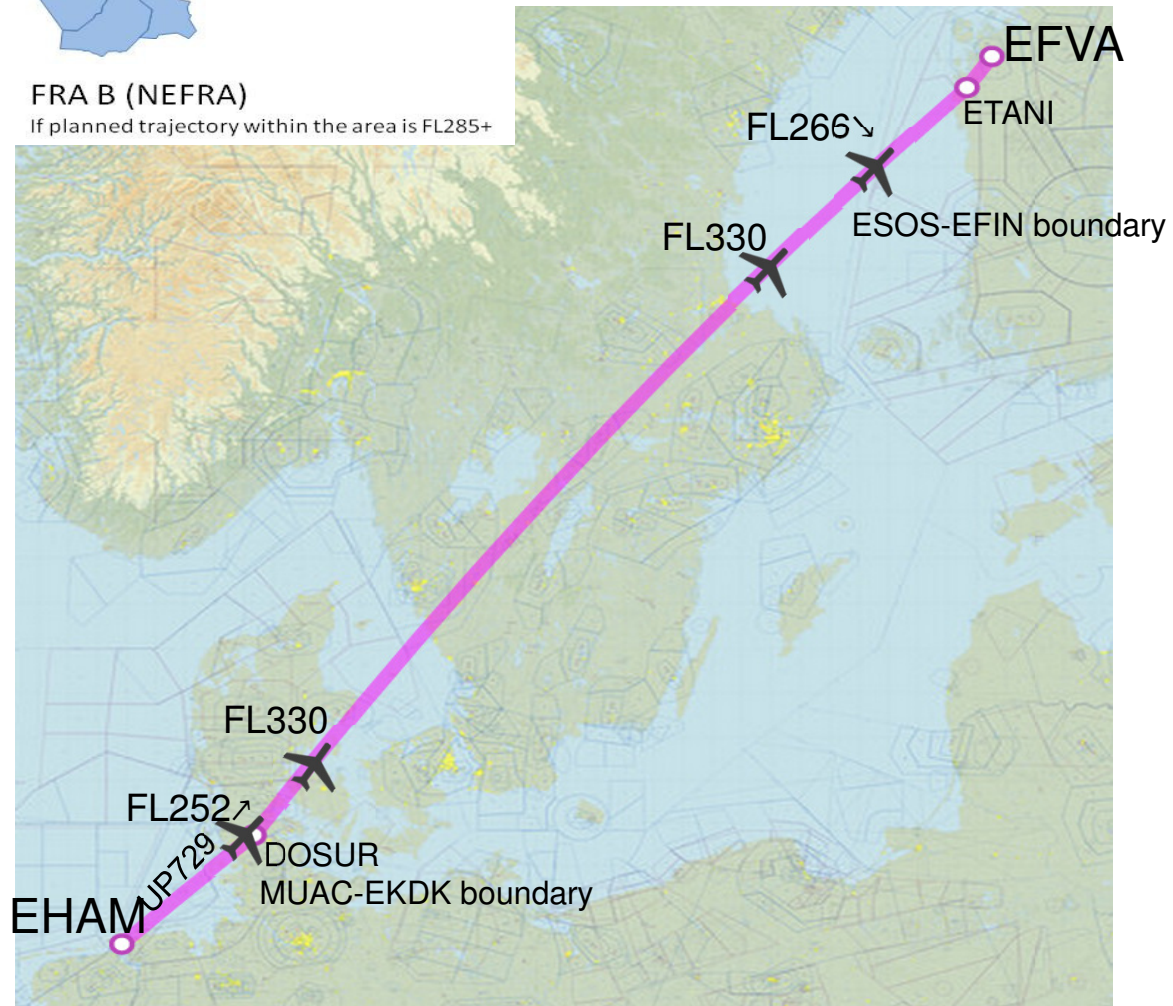
FRA A (NEFAB)  
If planned trajectory within the area is FL95+  
(FL135+ in Norway)

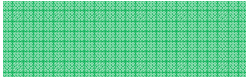
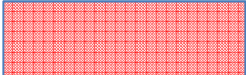



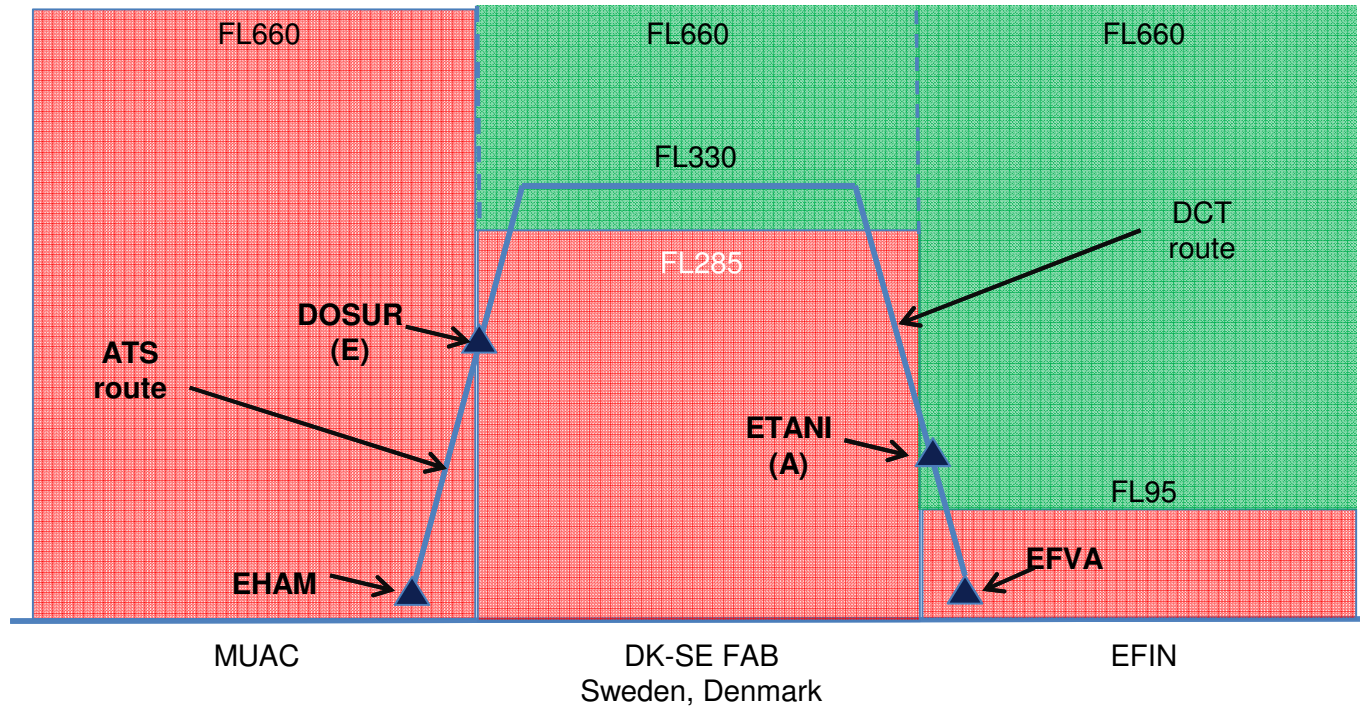


### FRA B (NEFRA)

If planned trajectory within the area is FL285+



-  FRA
-  ATS Routes
-  Planned trajectory



## Departing from an aerodrome

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Access to FRA for departing traffic is via a FRA Departure Transition Point (D).

The FRA Departure Transition point is either:

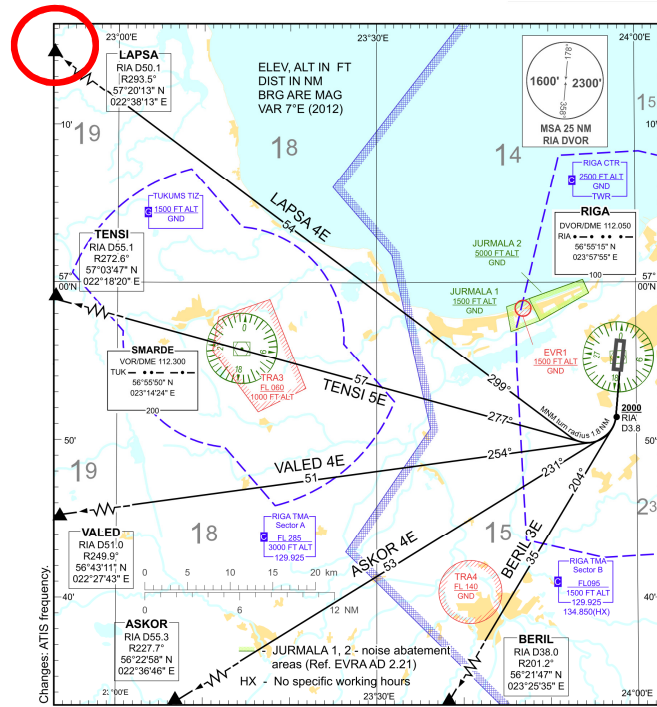
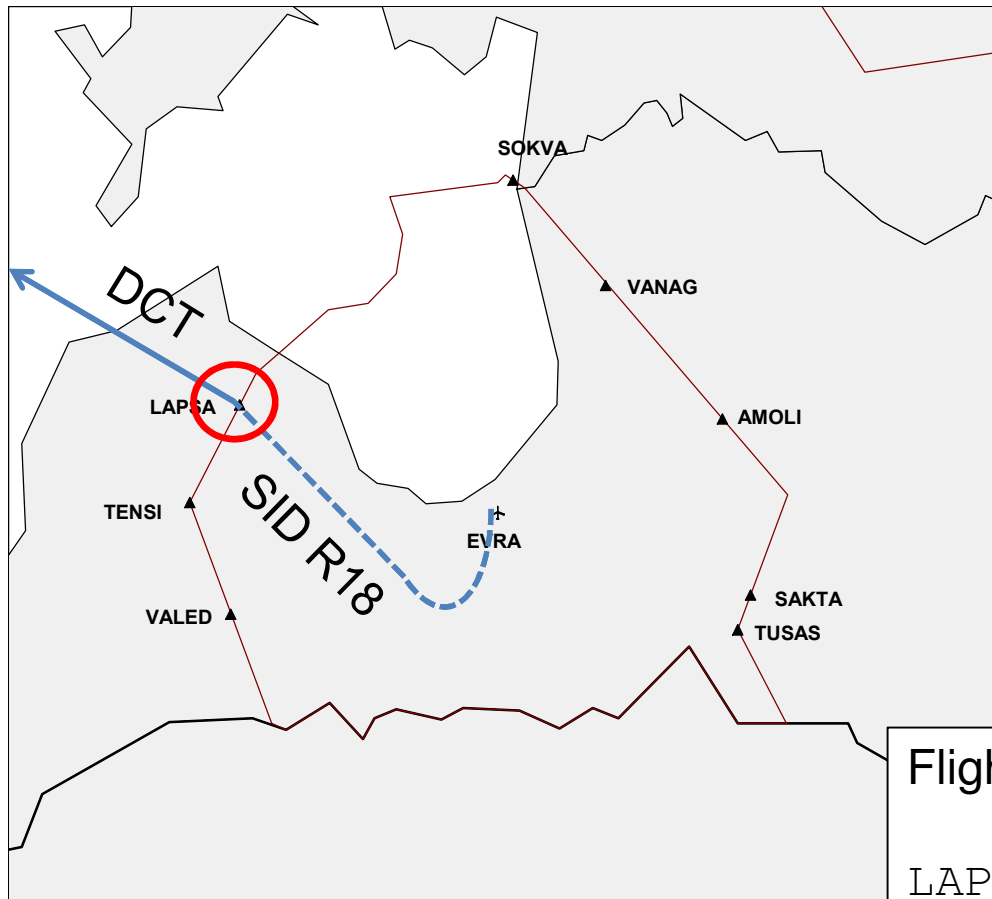
- SID final waypoint or TMA Exit Point as defined in RAD Appendix 5.
- For EFHK and ENGM departures the last point on a FRA Transition Route.

From FRA Departure Transition point a DCT segment is allowed.





# Departing from EVRA

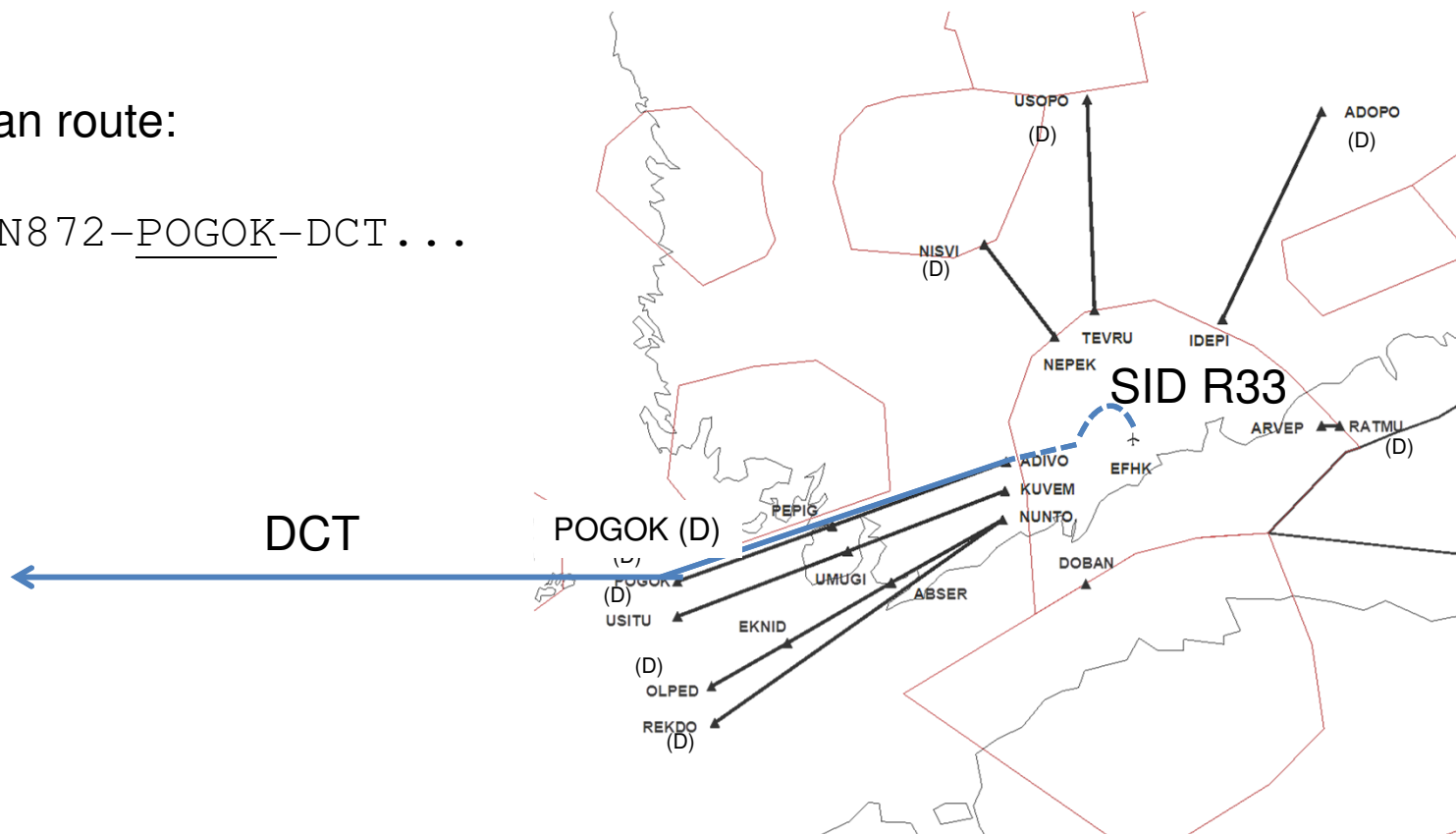


Flight plan route:  
LAPSA DCT ...

# Departing from EFHK

Flight plan route:

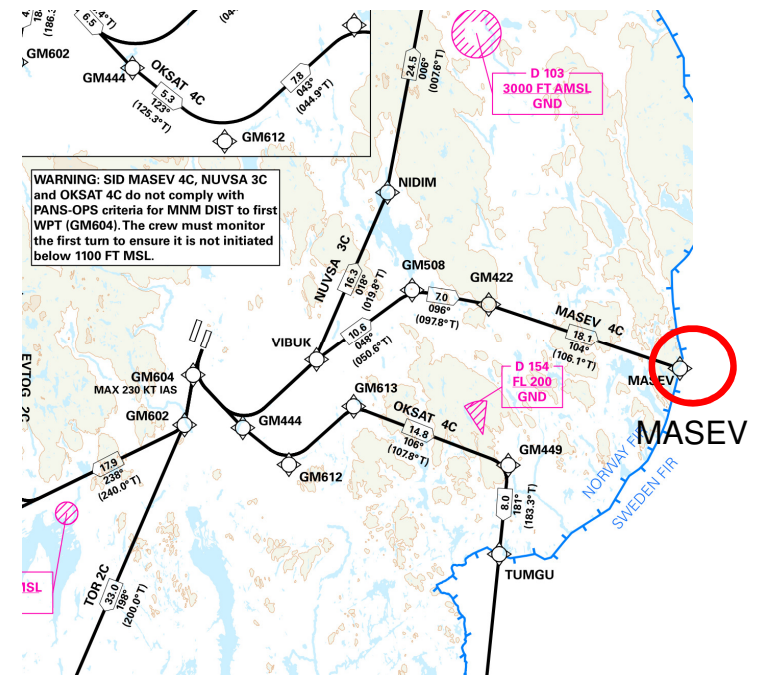
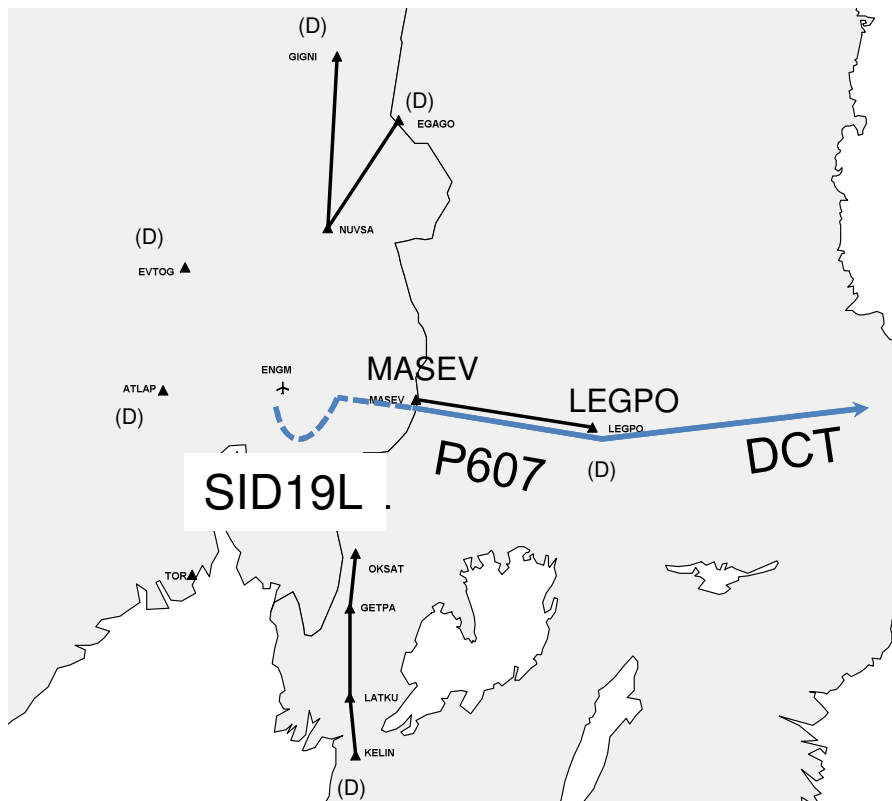
ADIVO-N872-POGOK-DCT...



# Departing from ENGM

Flight plan route:

MASEV-P607-LEGPO-DCT...



## Arriving to an aerodrome

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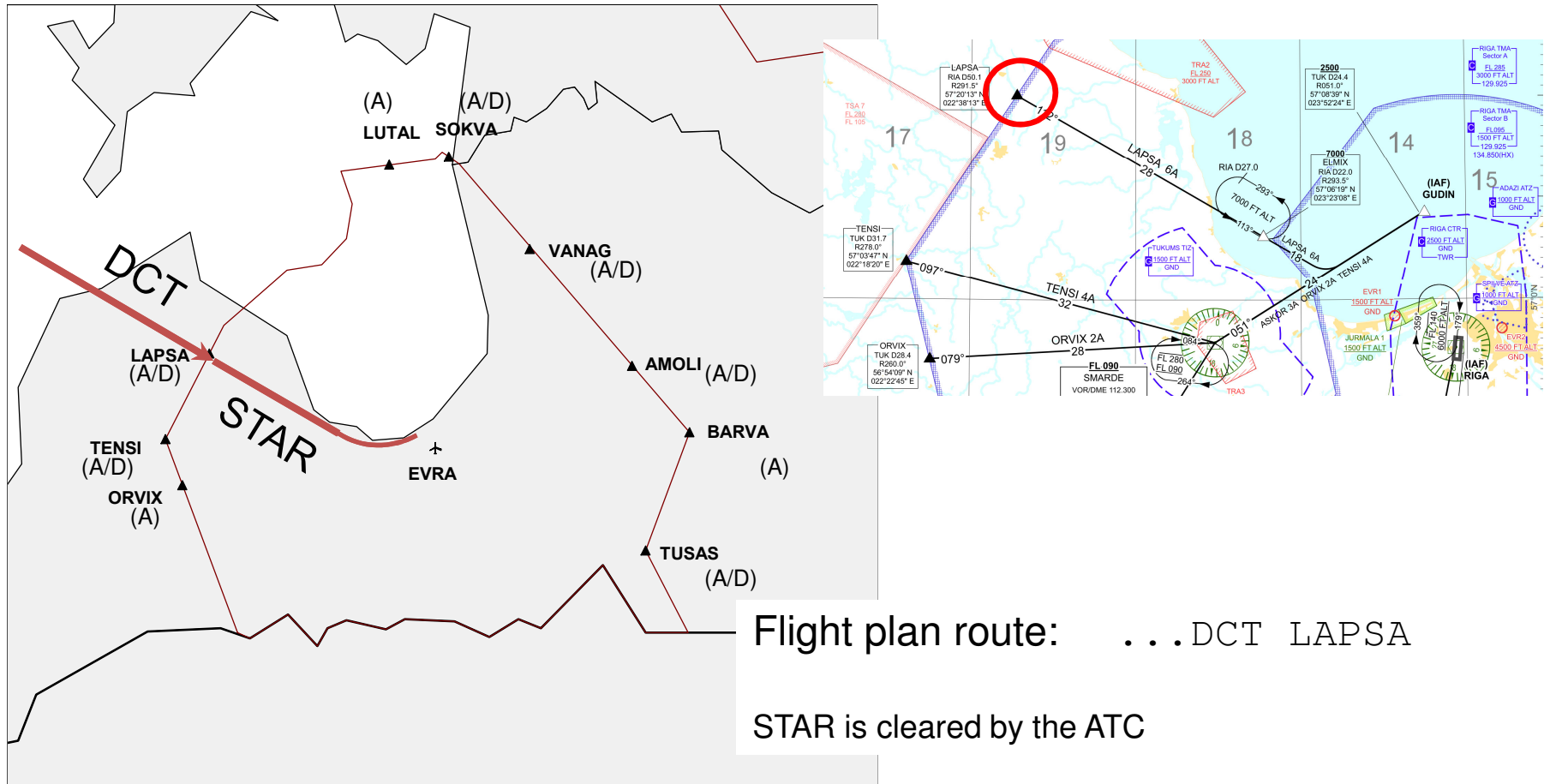
Arriving traffic may file DCT to a FRA Arrival Transition point (A).

FRA Arrival Transition Point is either:

- STAR initial waypoint or TMA boundary point as defined in RAD Appendix 5,
- for EFHK and ENGM arrivals the first point on a FRA Transition Route



# Arriving to EVRA

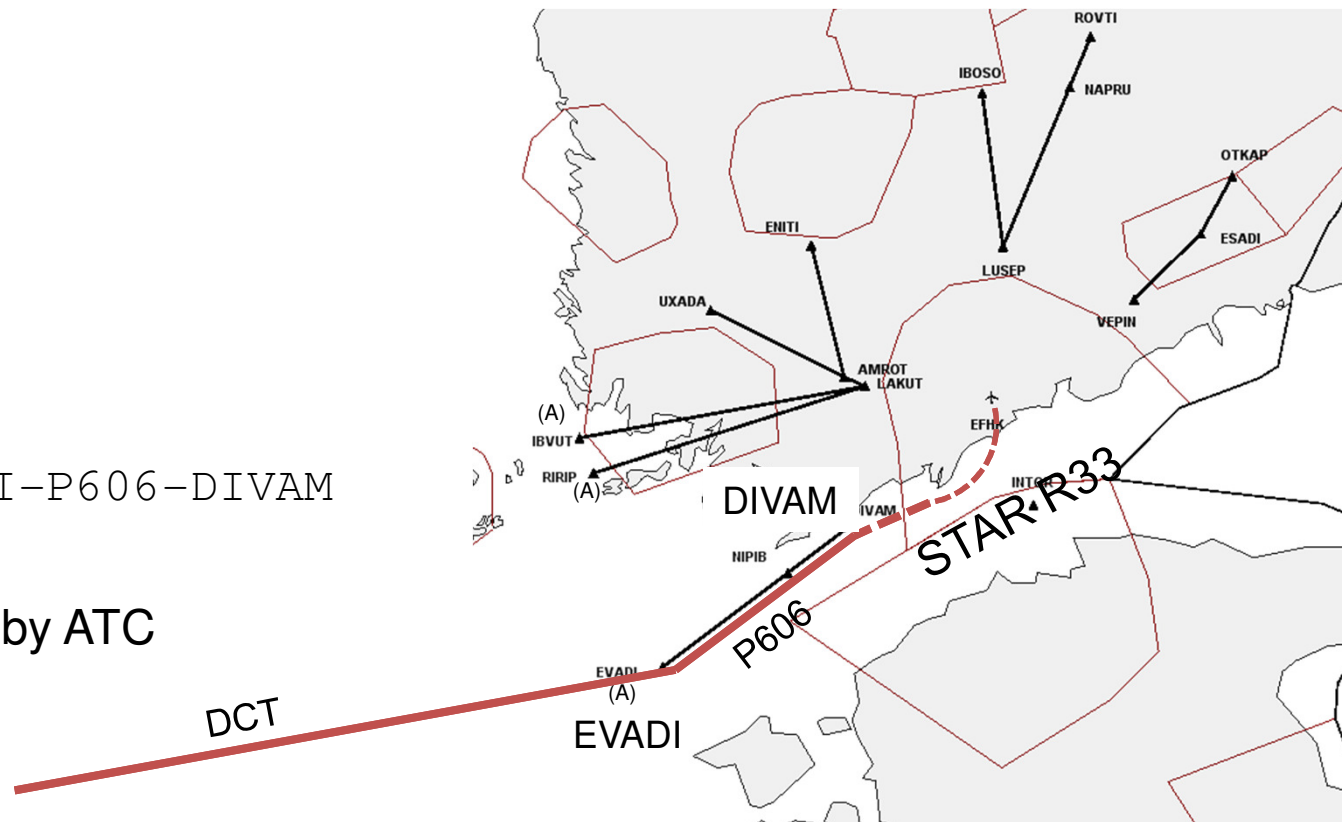


# Arriving to EFHK

Flight plan route:

... DCT EVADI-P606-DIVAM

STAR is cleared by ATC

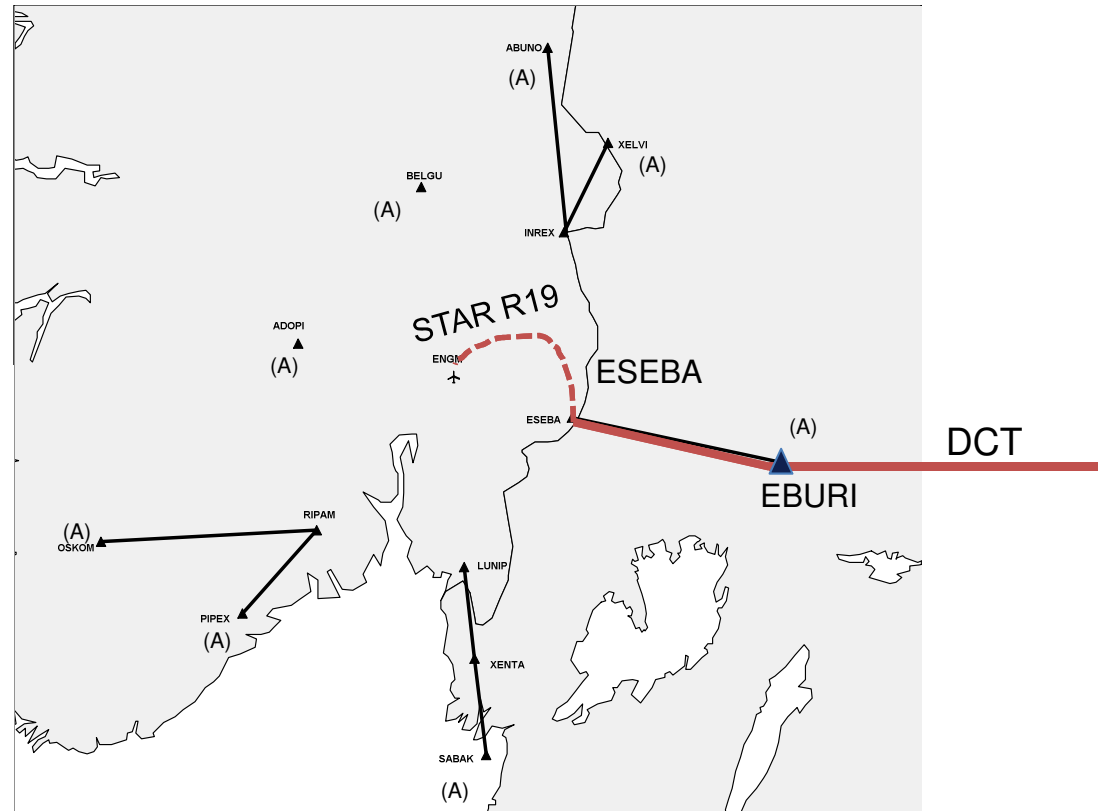
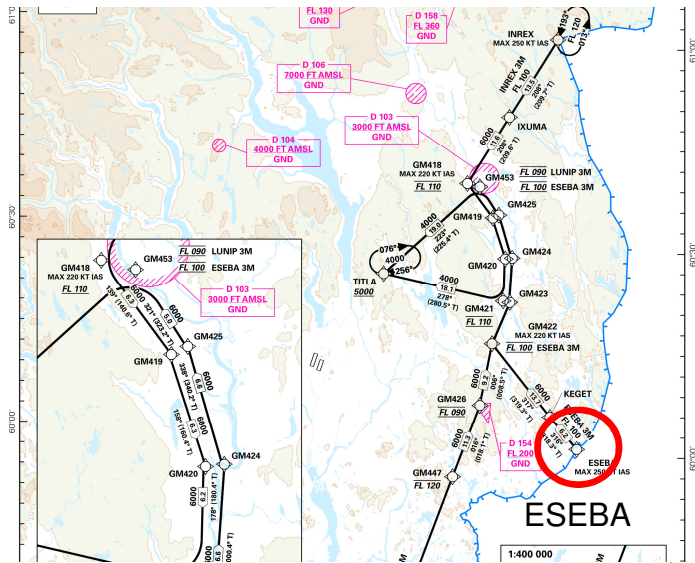


# Arriving to ENGM

Flight plan route:

DCT EBURI-N623-ESEBA

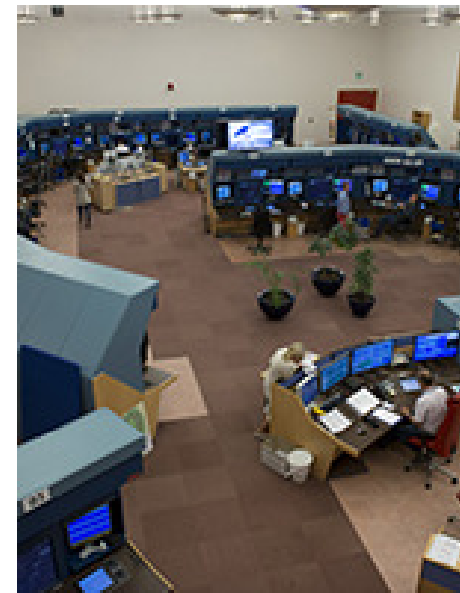
STAR is cleared by ATC



## Technical changes

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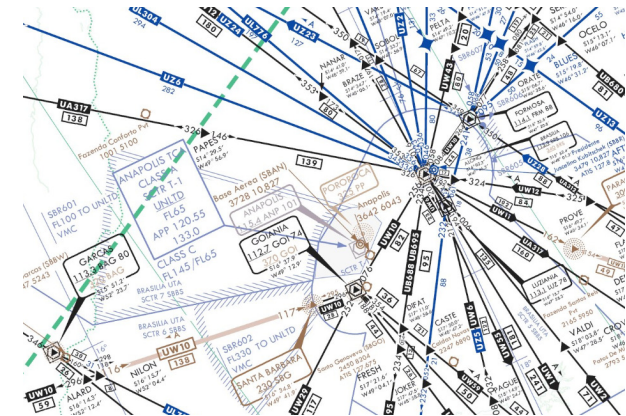
- ATM system requirements are presented in NEFAB Network Plan.
- Multi-FIR Free Route is technically much more complex than Free Route within one FIR – all the current ATC systems are build to handle traffic via defined points at FIR boundary.
- ANSPs are responsible for the system changes – significant investments in ATC and ASM systems.
- EUROCONTROL Network Manager system have been upgraded to support Free Route concept (rel18.5)
- Technical validation activities are on-going





# Publication

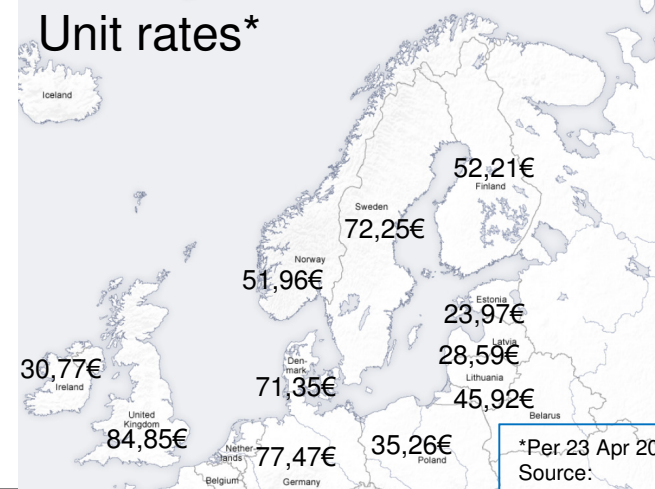
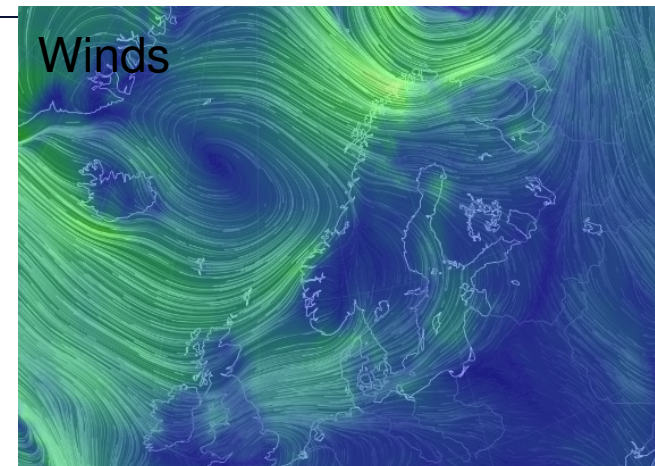
- Harmonisation of publication in national AIPs based on ICAO and ERNIP guidelines
- Simplification of the text in the publications as much as possible for user friendliness
- Airspace users shall, as far as practical, be able to access relevant information related to the operations in DK/SE FAB and NEFAB FRA by using the AIPs in any states concerned
- Map of the whole FRA in all 6 states AIP



## Effects – Where to fly

In a FRA operators have the option to plan their flight trajectories with optimum cost effects based on several variables, including:

- Route length and time flown impacting fuel costs and route charges for air navigation services (unit rates)
- Winds affecting flown length and time in air and amount of fuel
- Unit rates impacts costs per flown NM.



\*Per. 23 Apr 2014  
Source:  
EUROCONTROL and  
EANS

## Effects - economics:

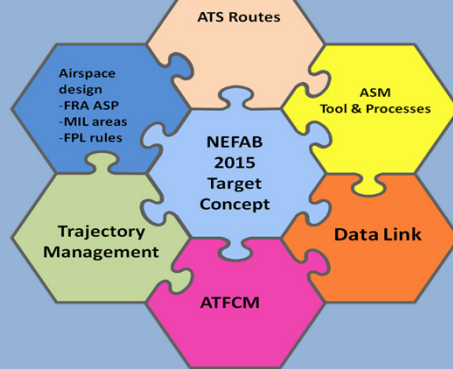
	Per day	Per year (*365)
Flights	4 785	1 746 525
Route length	-5 030 NM	-1 835 895 NM
Flying time	-828 min	-302 220 min
Fuel	-28 359 kg	-10 351 185 kg
Fuel cost	-19 446 €	-7 097 808 €
CO2	-89 620 kg	-32 711 475 kg
NOx	-393 kg	-143 463 kg

\* Route length reduction  
 Decrease for 2022 flights  
 Increase for 107 flights (modelling errors)  
 No change for 2656 flights (mainly those below FL285 and FRA in DK SE FAB)

\*\* Fuel cost reduction  
 Fuel cost based on IATA  
 Rate 949\$ per metric ton (4 Apr 2014)  
 949\$ = 685,7 € (16 Apr 14, Coinmil.com)



# NEFAB: Target Concept Design



Local ANSP Implementation projects

Task Name	Duration	Start	Finish	Predecessors	Resource Names
Software Development	95.75 days	Mon 3 14 08	Mon 5 26 08		
Scope	1.5 days	Mon 3 14 08	Mon 3 14 08		Management
Determine project scope	1 day	Mon 3 14 08	Mon 3 14 08		Management
Outline preliminary resources	1 day	Tue 14 08 08	Tue 14 08 08		Project manager
Outline core resources	1 day	Wed 14 08 08	Thu 14 08 08		Project manager
Outline complete	0 days	Thu 14 08 08	Thu 14 08 08		Project manager
Analysis Software Requirements	14 days	Wed 3 14 08	Wed 3 14 08		Analyst
Conduct needs analysis	0 days	Thu 14 08 08	Thu 14 08 08		Analyst
Draft preliminary software specifications	2 days	Thu 14 08 08	Fri 14 08 08		Analyst
Develop preliminary budget	2 days	Tue 14 08 08	Thu 14 08 08		Project manager
Review software specifications/budget	4 days	Thu 14 08 08	Thu 14 08 08		Project manager, Analyst
Reconcile hardware on software team	1 day	Fri 24 08 08	Fri 24 08 08		Analyst
Develop software baseline	4 days	Tue 24 08 08	Tue 24 08 08		Project manager
Obtain approval to proceed (connect, H)	0 days	Wed 24 08 08	Wed 24 08 08		Management, Project
Outline required resources	10 days	Wed 24 08 08	Wed 24 08 08		Project manager
Review complete	0 days	Wed 24 08 08	Wed 24 08 08		Project manager
Baseline	14.5 days	Wed 3 14 08	Wed 3 14 08		
Review preliminary software specifications	2 days	Wed 24 08 08	Fri 24 08 08		Analyst
Develop functional specifications	0 days	Fri 24 08 08	Fri 24 08 08		Analyst
Develop prototype based on functional	4 days	Fri 24 08 08	Thu 29 08 08		Analyst
Review functional specifications	2 days	Thu 29 08 08	Mon 29 08 08		Management
Reconcile hardware into functional spec	4 days	Mon 29 08 08	Tue 29 08 08		Management, Project
Obtain approval to proceed	0 days	Tue 29 08 08	Tue 29 08 08		Management, Project
Design complete	0 days	Tue 29 08 08	Tue 29 08 08		Project
Development	21.25 days	Wed 3 14 08	Wed 3 14 08		
Review functional specifications	1 day	Wed 20 08 08	Wed 20 08 08		Developer
Analyze code/develop design parameter	1 day	Thu 20 08 08	Thu 20 08 08		Developer
Design development start	1 day	Fri 20 08 08	Fri 20 08 08		Developer
Develop code	18 days	Mon 20 08 08	Fri 30 08 08		Developer



Training

ANSP



NEFAB 2015 in operation

NSA Approval



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Thank you for your attention

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## List of contacts – the speakers and facilitators

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Knut Bjarne Klaussen: [Knut.Bjarne.Klaussen@avinor.no](mailto:Knut.Bjarne.Klaussen@avinor.no) (Airspace)

Silja Marken: [silja@eans.ee](mailto:silja@eans.ee) (Programme Office, Programme Coordinator)

Solvita Maskova: [solvita.maskova@lgs.lv](mailto:solvita.maskova@lgs.lv) (Programme Office, Communications)

Anders Saetre: [anders.saetre@avinor.no](mailto:anders.saetre@avinor.no) (Programme Office, Programme Manager)