

The Free Route Airspace Implementation Workshop / 2

Bangkok, Thailand

13th Nov 2024

This event is jointly organised with



FRA - Bringing the World Together



Free Route Airspace Implementation Workshop



ICAO

Bangkok, Thailand
13 NOV 2024

FRA - Bringing the World Together

Let me take you on a journey...



IFATCA

Frédéric Deleau, IFATCA EVP Europe

FRA - Bringing the World Together

From “A” to “F.R.A.” – Cross Border FRA Operation

Introduction

IFATCA EVPEUR

Objectives

History

Where do we come from?

Going across borders

FRA with DFS Karlsruhe UAC

Gate concept

MUAC

What and Where is MUAC?

FRA at MUAC

Concept of operation

Objectives

Conclusion

+ Q&A

Coordination between Different ATC Centres and Cross - Border Issues

- IFATCA EUR
- MUAC
- Set the scene
- FRA MUAC
- FRA "Across"
- Conclusion
- Q/A

Frédéric Deleau, IFATCA EVP Europe

My hobby...

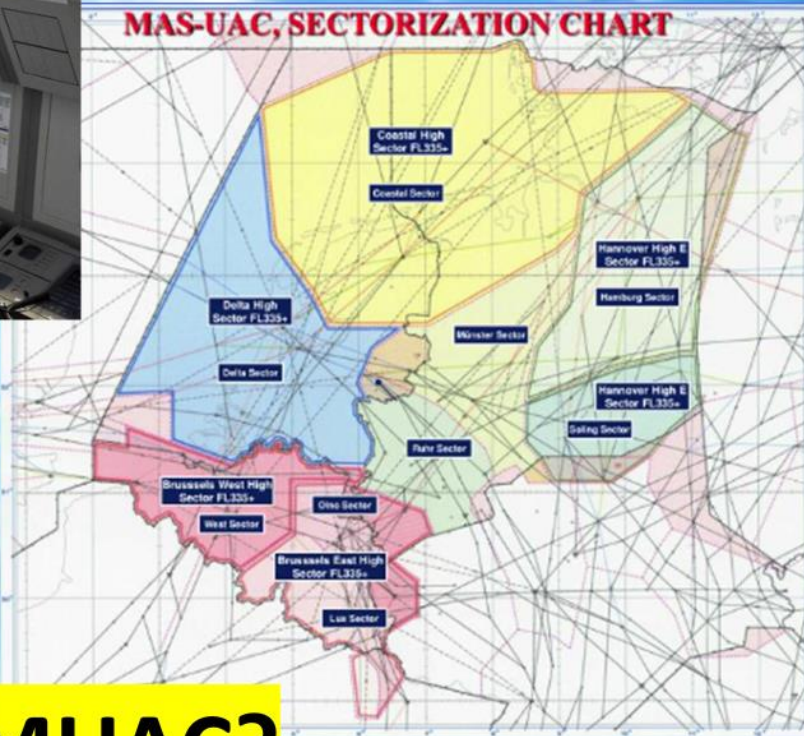


MUAC Senior ATCO

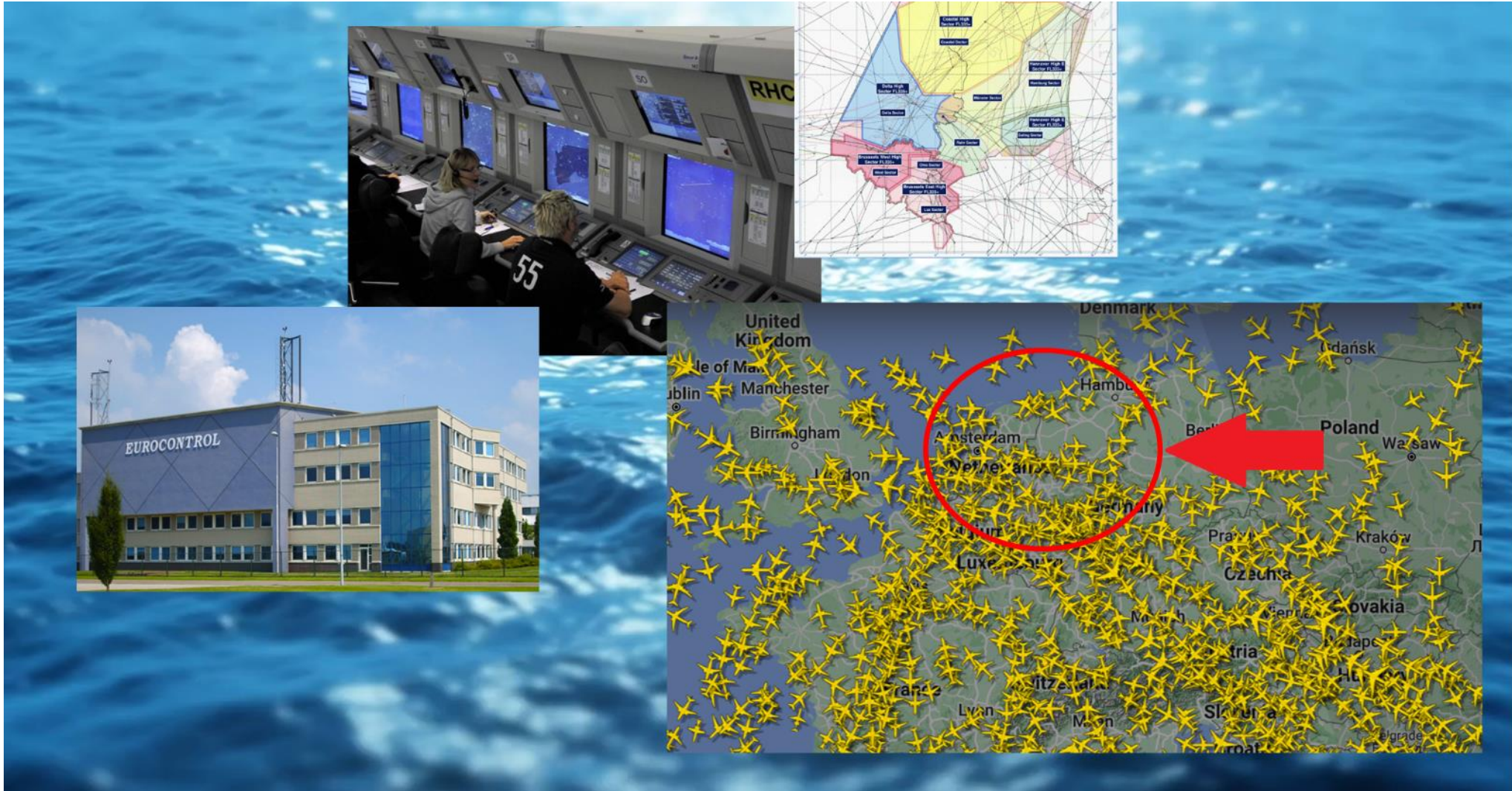
IFATCA Europe

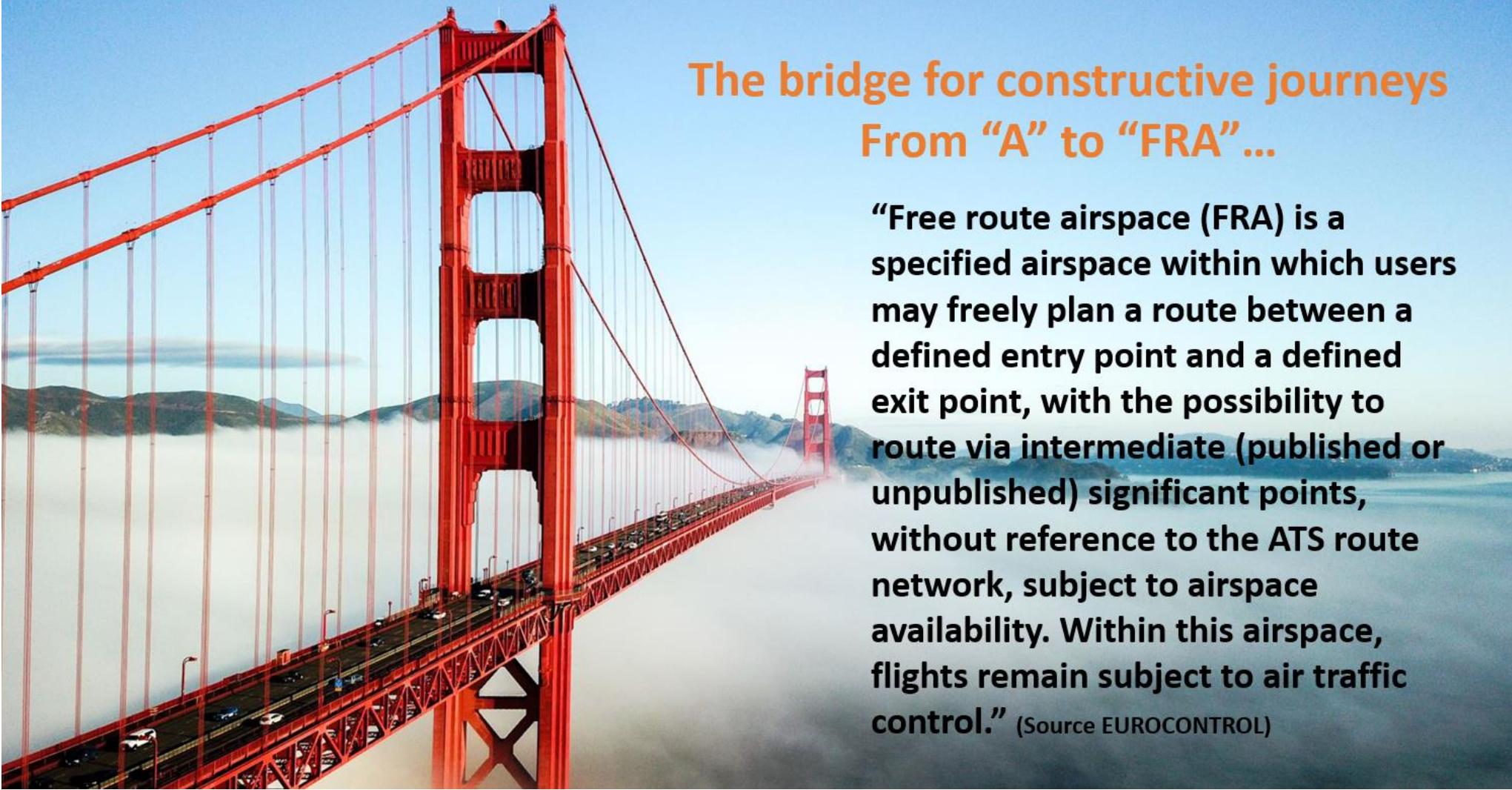


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BUT WHERE IS MUAC?

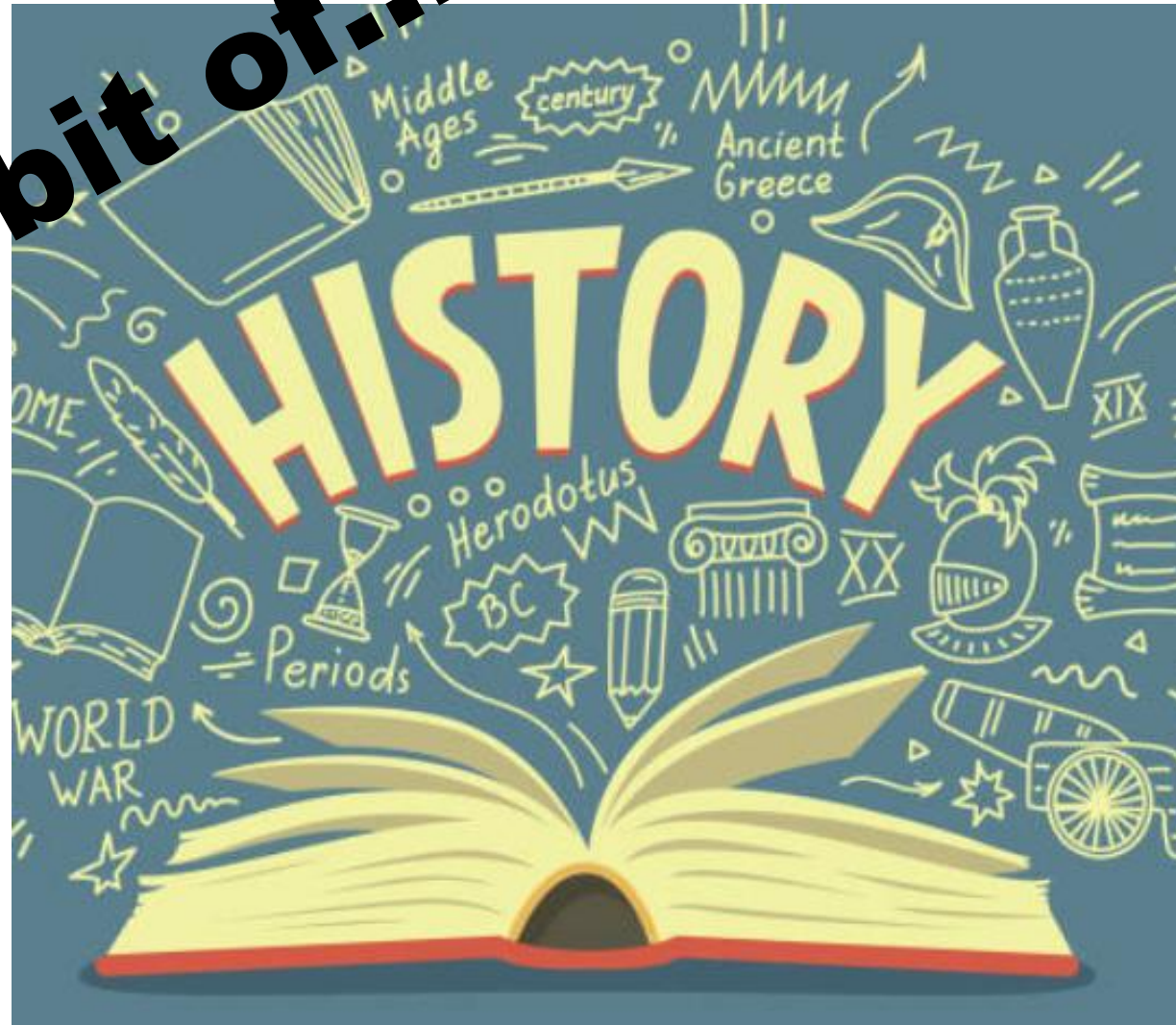




The bridge for constructive journeys From “A” to “FRA”...

“Free route airspace (FRA) is 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between a defined entry point and a defined exit point, with the possibility to route via intermediate (published or unpublished) significant points, without reference to the ATS route network, subject to airspace availability. Within this airspace, flights remain subject to air traffic control.” (Source EUROCONTROL)

A bit of...



From "A" – the corridors – the iron curtain



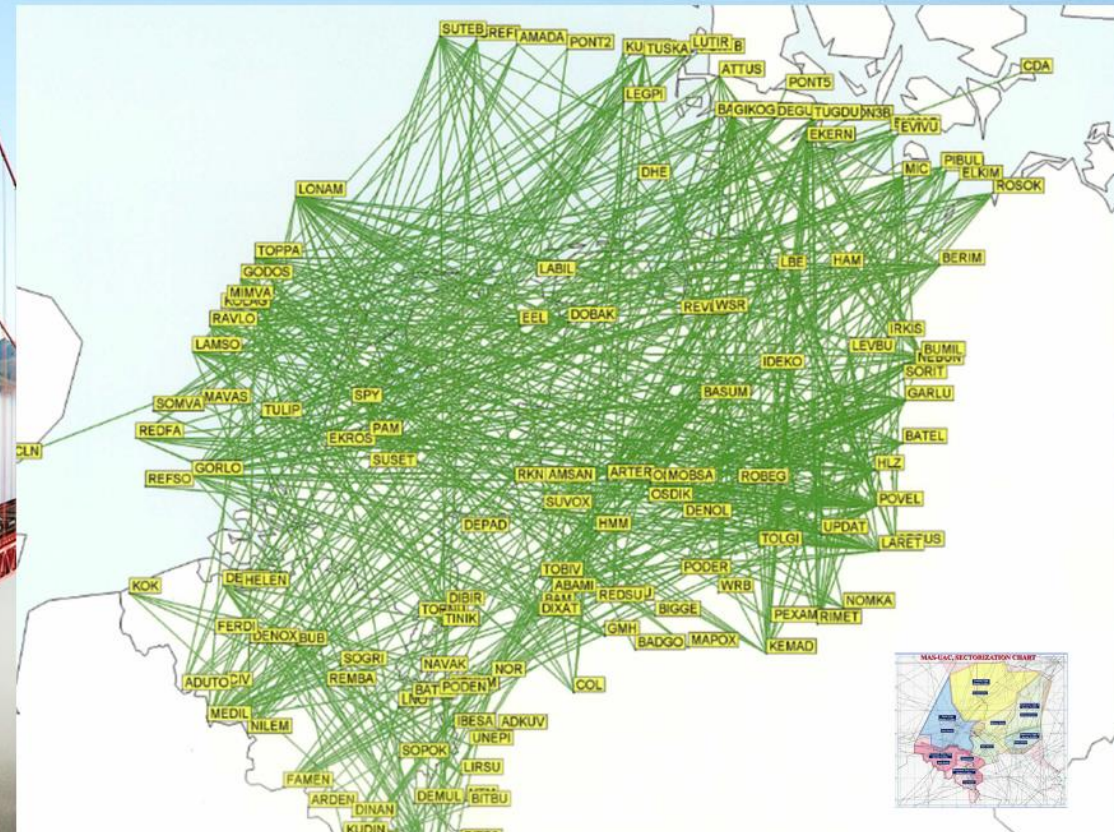
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To “FRA” – Free Route Airspace



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To “FRA” – Free Route Airspace



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The objectives of Free Route Airspace at MUAC

Credit to EUROCONTROL MUAC - FRA Team

In particular

Andreas Henn and Kris Scicluna for their help

Free Route Airspace at MUAC

The objectives of Free Route Airspace at MUAC



**EU regulation 716/2014
"Pilot Common Project"**

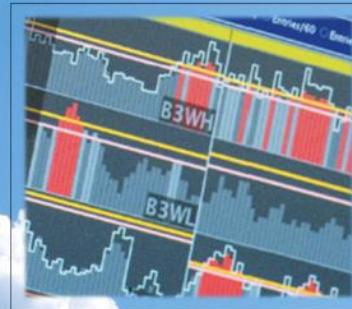
**Implementation of FRA on
behalf of four states**



**Increase the number of
route options**

**Support the increase of
flight planning
efficiency**

**Estimated benefits are
26 million EUR / year in
H24 FRA environment**



**Increase flight plan
predictability**



**More options to
balance demand and
capacity**

**More options to react
on capacity constraints**

Source: Free Route Airspace Maastricht

Free Route Airspace at MUAC was implemented in three Phases



07-DEC-2017

- 23:00 – 05:00 (22:00 - 04:00)
- ATS-Routes remain

06-DEC-2018

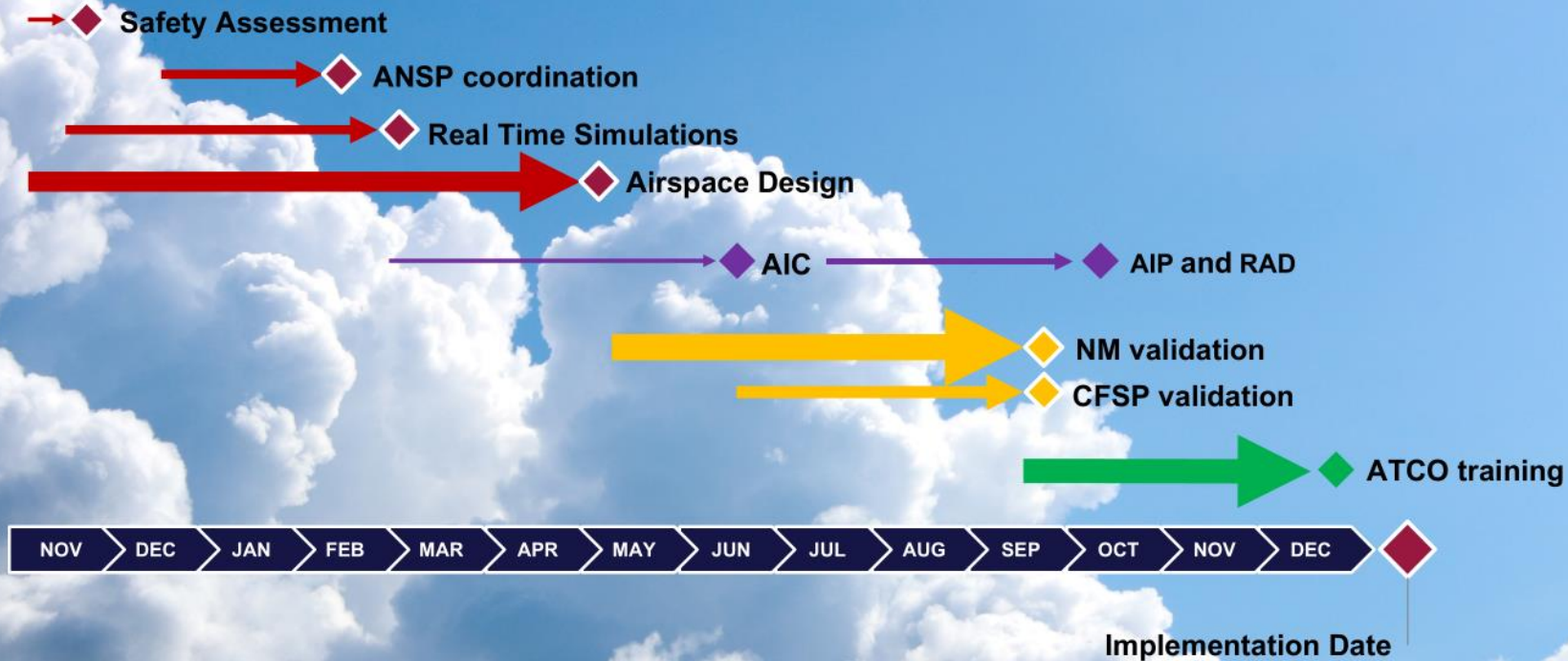
- MON - THU 23:00 - 05:00 (22:00 - 04:00)
and
FRI 23:00 (22:00) - MON 05:00 (04:00)
- ATS-Routes remain

Spring 2020

- H24
- ATS-Routes removed

Source: Free Route Airspace Maastricht

The MUAC Development Cycle for each FRAM Phase



Source: Free Route Airspace Maastricht

The MUAC Concept of Operations for Free Route Airspace

Free Route Airspace with
Intermediate
waypoints

Traffic remains subject to general
rules, procedures and agreements
with **adjacent / subjacent ATC units**

Trajectories shall not
plan closer than **2.5nm**
to the FRA border



Lateral connectivity via
E / X points

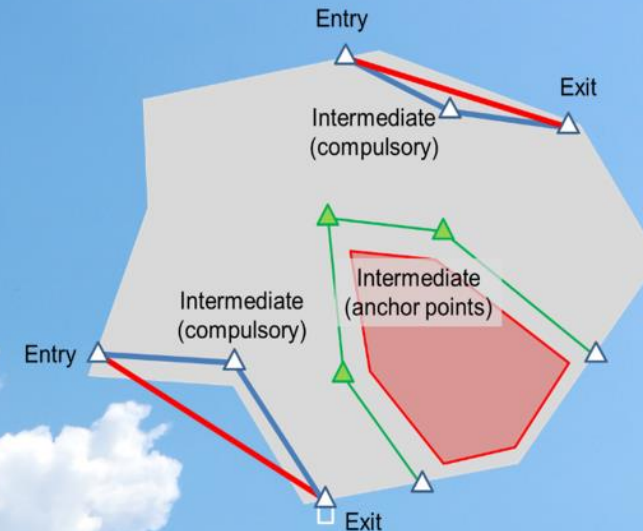
Vertical connectivity via
A / D points

Connecting Routes
for main departure / arrival flows

Source: Free Route Airspace Maastricht

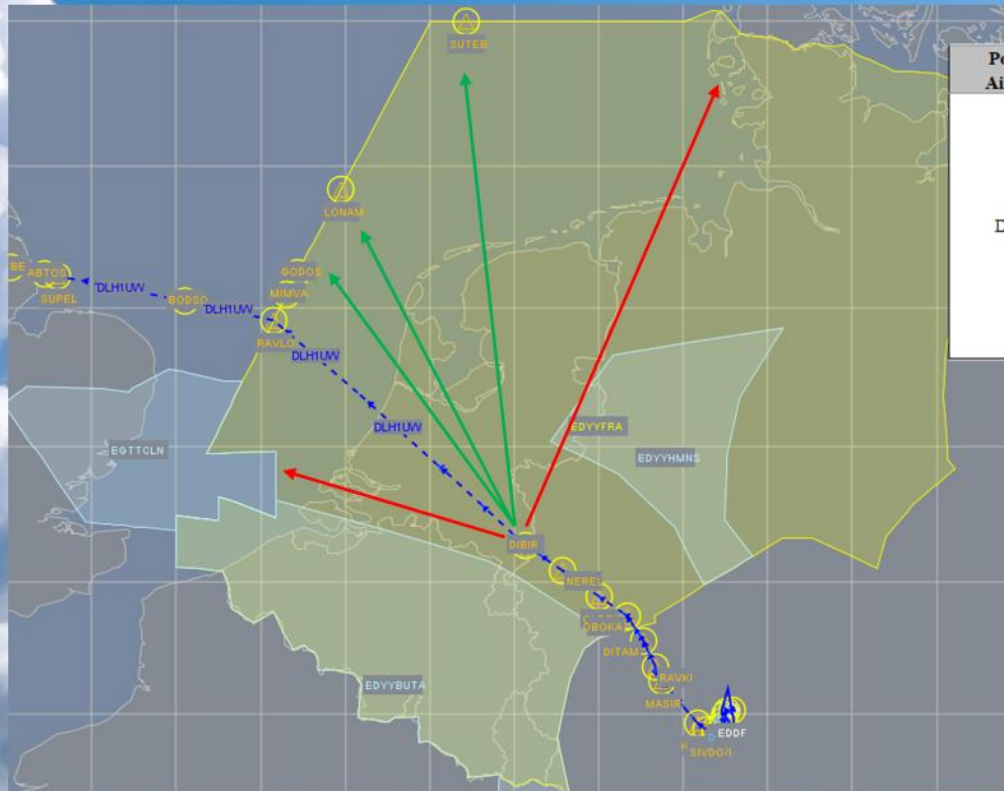
Enroute Design and Flight Planning Rules (RAD)

- **Use of FRA Intermediate points**
 - Avoid re-entry cases
 - Avoid sector clipping
 - Circumnavigation of MIL areas
- Enroute design has evolved from ATS-Route design to a Flight Planning Rules set (RAD).
- Flight Planning Rules have evolved from route segment restrictions to point / airspace restrictions.



Source: Free Route Airspace Maastricht
DES FRA Design Principles

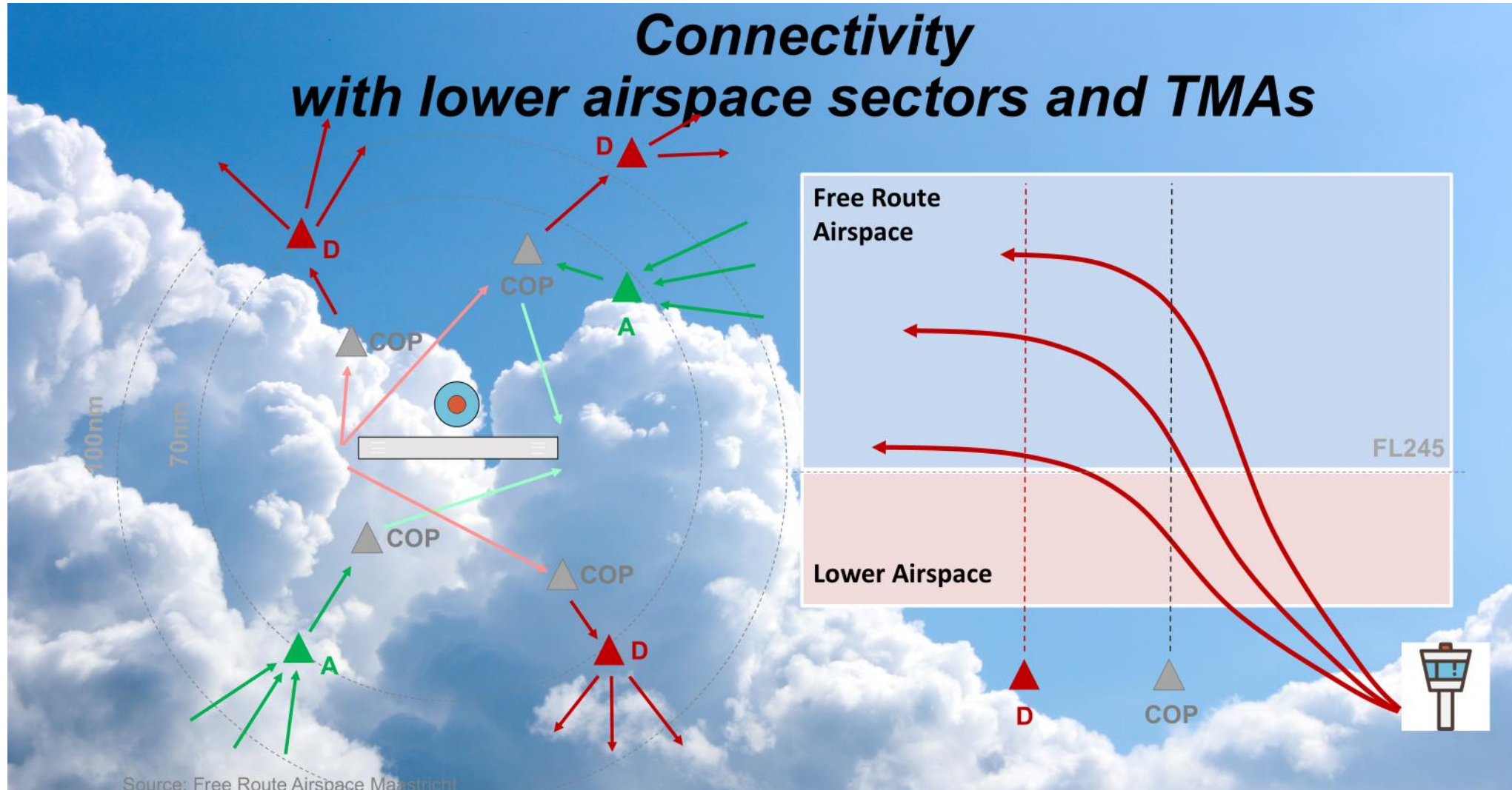
Enroute Design and Flight Planning Rules (RAD)



Point or Airspace	Utilization	Time Applicability	Operational Goal
DIBIR	NOT AVAILABLE FOR TRAFFIC DEP (EDDF, EDFE, EDFZ, ETOU) 1. Via EDYYHMS 2. Via EDYYBUTA 3. Via EGTTCN	H24	1. To avoid sharp turns. Specified flights shall proceed northwest bound to keep clear of the Muenster sector of Maastricht UAC. These flights shall file via ABILU. 2. Flights via DIBIR shall not plan to enter EDYYBUTA. 3. Flights via DIBIR shall not plan to enter the Clacton sectors of London ACC. These flights shall file via OBOKA Z29 TORNU.

Source: Free Route Airspace Maastricht

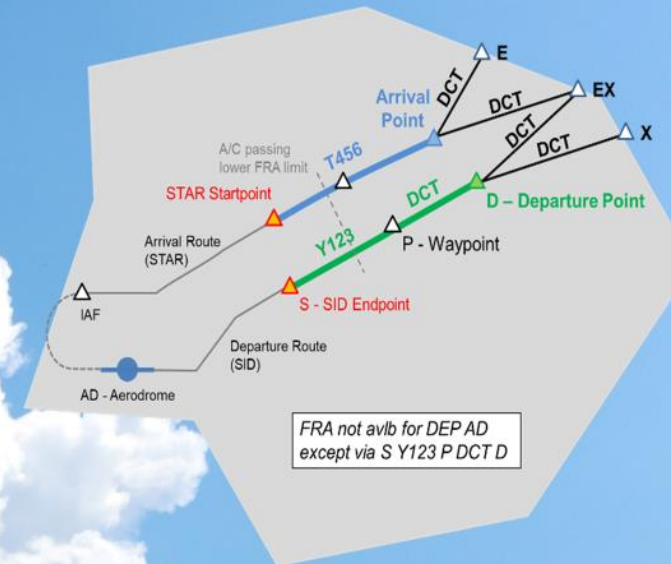
Connectivity with lower airspace sectors and TMAs



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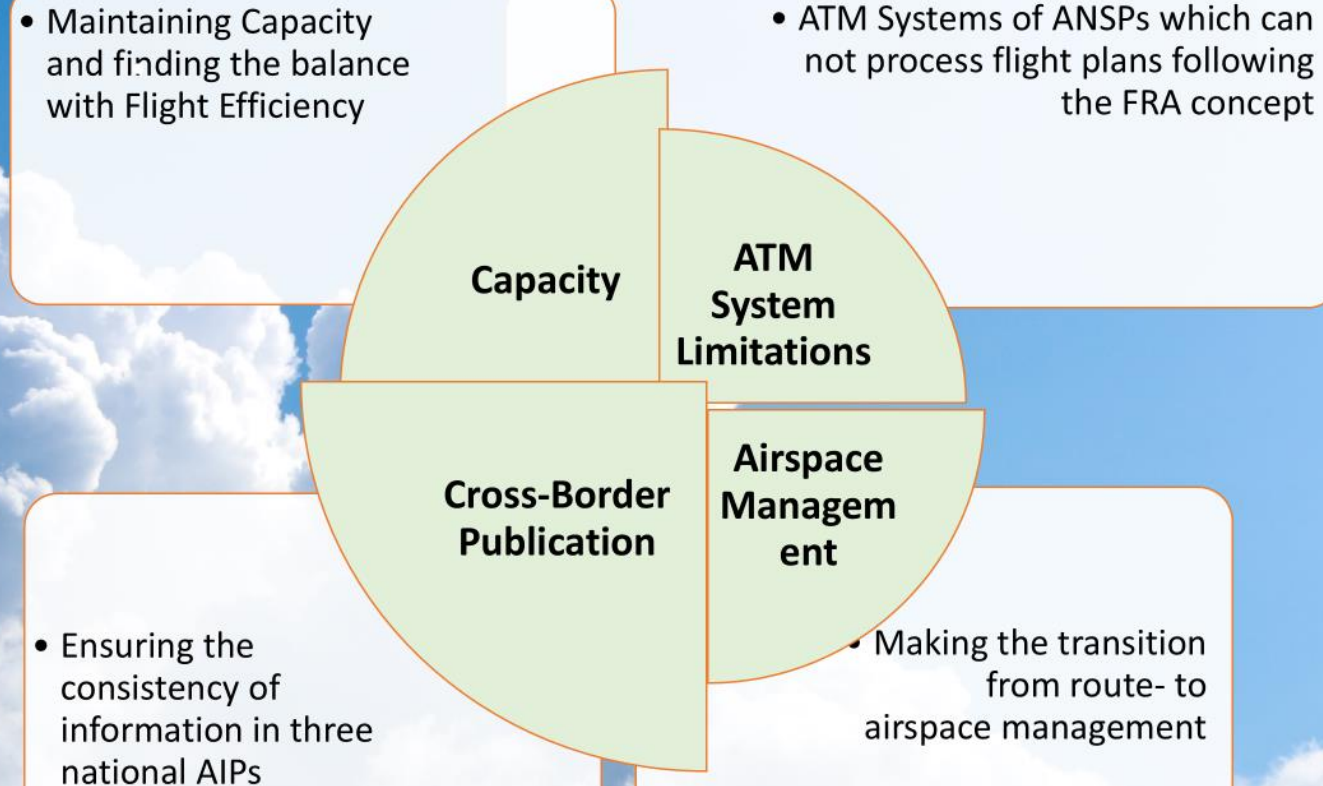
Connecting Routes Concept

- Vertical entry / exit into FRA is ensured via FRA Departure / Arrival Points.
- FRA Departure / Arrival Points are connected to the ATS-Route network of Lower Airspace sectors.
- Connecting Routes ensure seamless transition from Lower Airspace into the FRA volume and vice versa according to LoAs and OLDI exchange.
- Compulsory routings for major departure / arrival flows published via the RAD.



Source: Free Route Airspace Maastricht

Challenges for the implementation of Free Route Airspace at MUAC



Source: Free Route Airspace Maastricht

Summary:

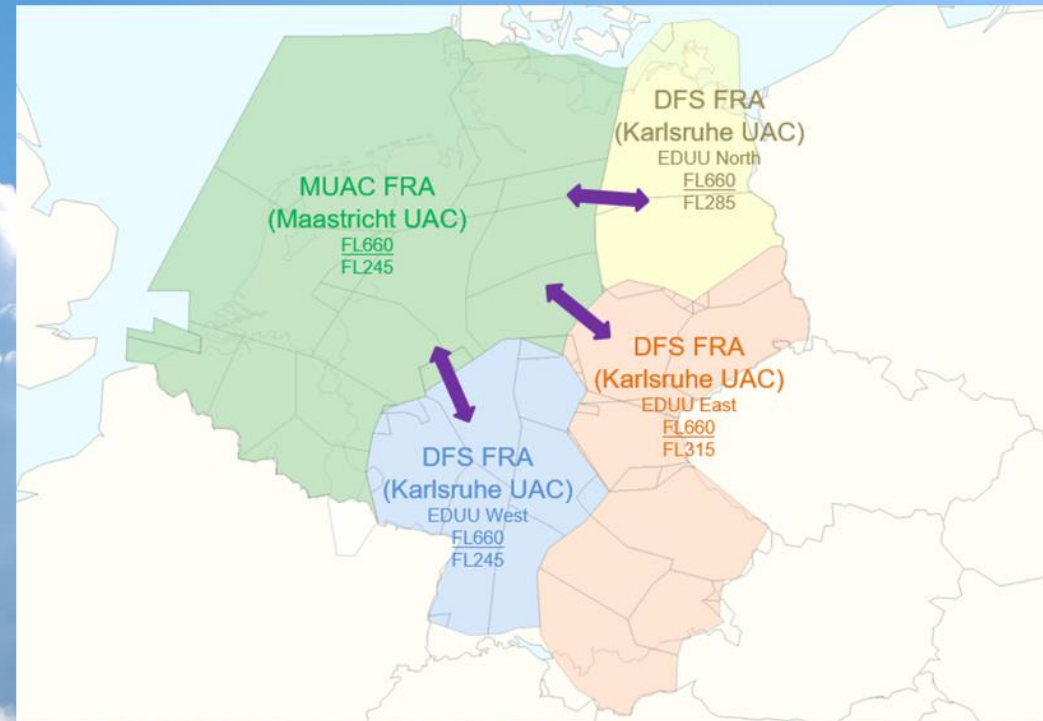
- FUA (Flexible Use of Airspace) – Civil/Mil. Cooperation
- Technology (Radar environment)
- Phases implementation (night -> H24//Levels)
- Flexibility/Adaptability (Sector borders adaptation - MASERATI)
- Transparency
- Benefits (CO2 – Capacity)



Free Route Airspace at MUAC -> Cross-Border FRA Scope

Free Route Airspace at MUAC ➡ Cross-Border FRA Scope

- DFS and MUAC are collaborating on cross-border FRA operations between four FRA areas:
- MUAC FRA and DFS FRA Cell EDUU North
 - FL285 – FL660
 - H24
- MUAC FRA and DFS FRA Cell EDUU East
 - FL315 – FL660
 - H24
- MUAC FRA and DFS FRA Cell EDUU West
 - FL245 – FL660
 - H24
 - Structural Limitations implemented by means of “Gates”



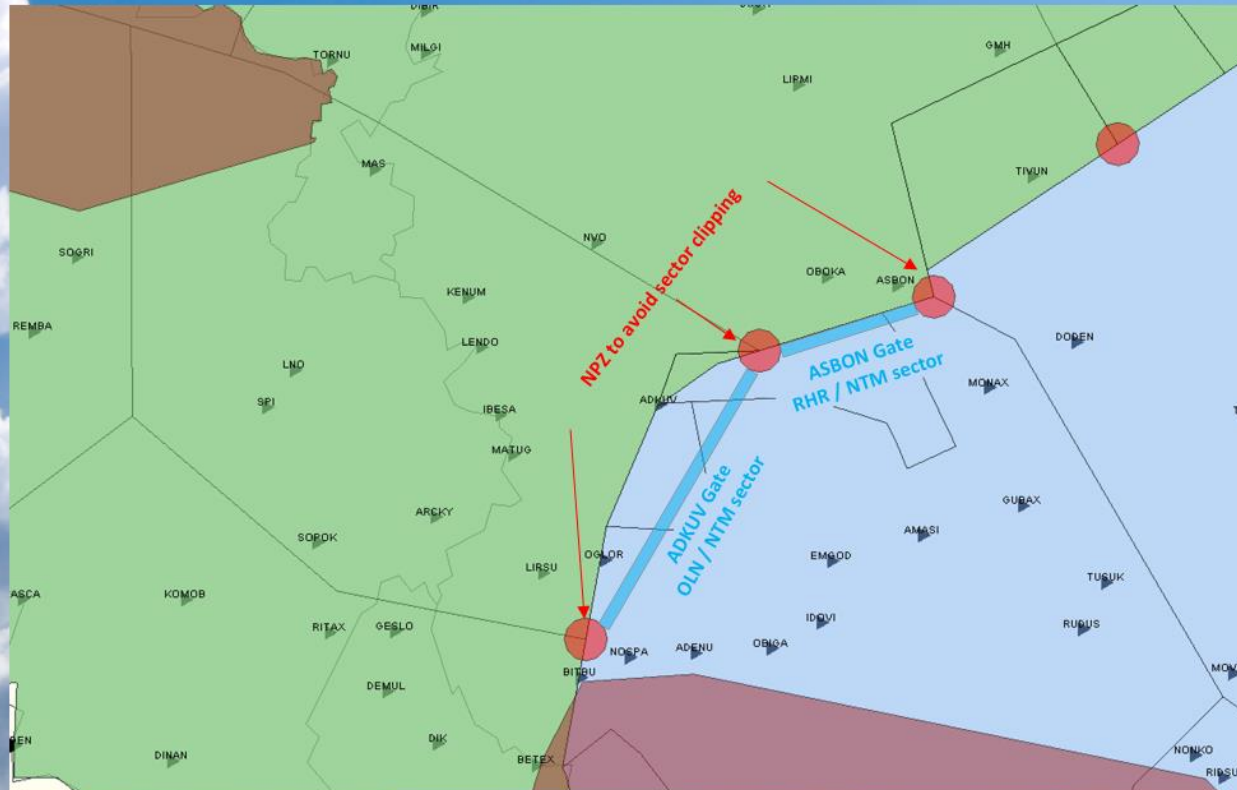
Source: Cross-Border FRA Karlsruhe UAC / Maastricht UAC

Cross-Border FRA Concept

- **FPLs will adhere to conceptual rules...**
 - Planning allowed from a FRA Entry / Departure / Intermediate point located in one of the four FRA areas directly to a FRA Exit / Arrival / Intermediate point in an adjacent FRA area.
 - The route shall contain at least one FRA point per FRA area.
- **Former Boundary Points remain available for ...**
 - Route / Profile optimisation
 - Circumnavigation of military areas
 - Compatibility with current FPL routes
- **Flight Planning Rules and Sector Sequence are ...**
 - Retained in areas where / during times when high ATC efficiency and capacity is required
 - Relaxed in areas where / during times when traffic density and complexity is low

Source: Cross-Border FRA Karlsruhe UAC / Maastricht UAC

Gate Concept for Flight Planning purposes



- NPZs on sector corners will be created to avoid sector clipping on flight planning level; hence avoid increased work-load for aircraft vectoring.
- Along the sector interface, “Gates” will be created to be used as reference location to which RAD rules can be connected.
- Current traffic flow rules refer to the FRA Entry / Exit points (e.g. ADKUV)
- In cross-border FRA, traffic flow rules apply to all trajectories crossing the volumes of the Gates (including current trajectories which file via boundary points)

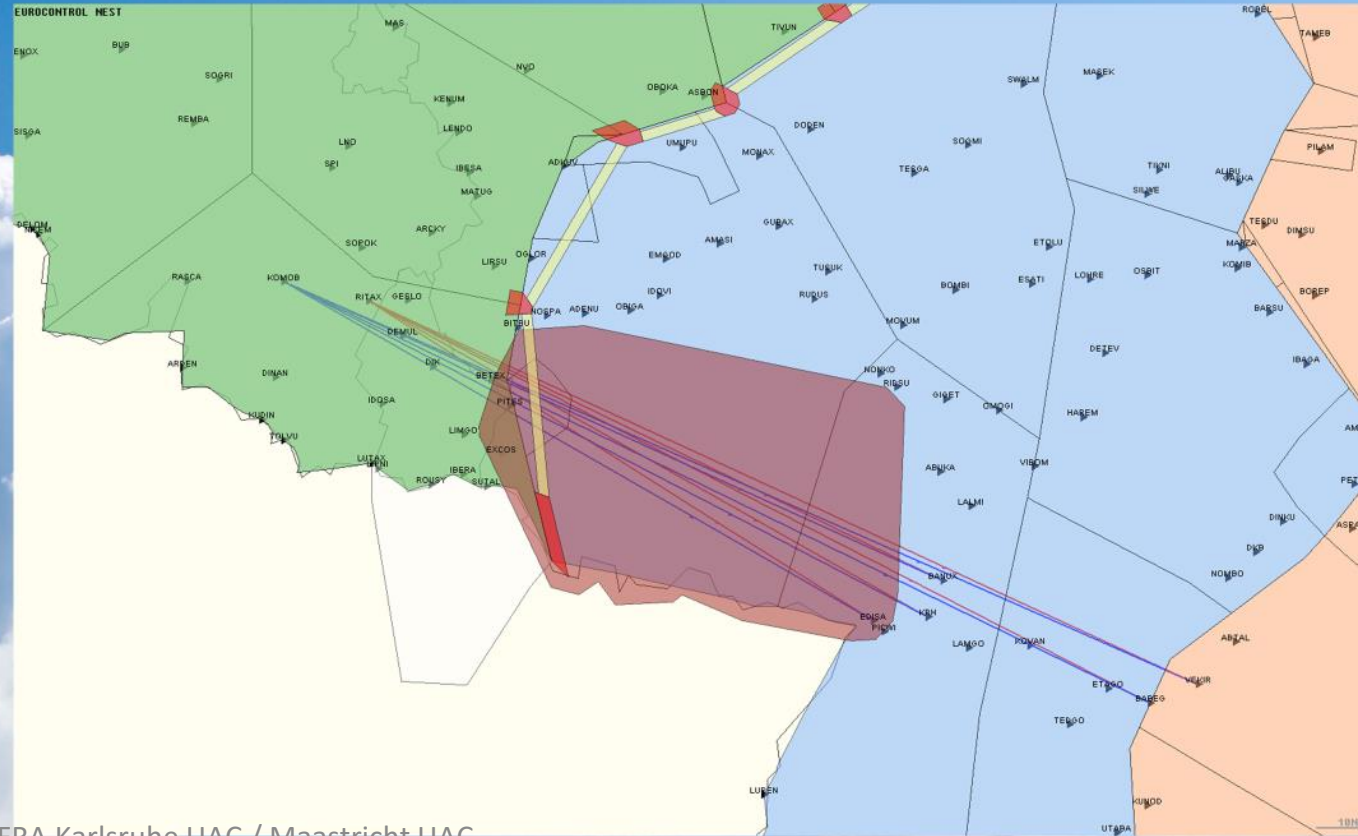
Source: Cross-Border FRA Karlsruhe UAC / Maastricht UAC

Trajectory examples OLN > NTM sector eastbound

The map displays the North Atlantic region, including parts of Europe, Africa, and North America. Key airports and locations are labeled, such as LND, SFI, LIS, MAD, and others. A red shaded area is visible in the central part of the map, likely representing a specific flight corridor or region of interest. The map is overlaid with a grid of latitude and longitude lines.

Source: Cross-Border FRA Karlsruhe UAC / Maastricht UAC

Trajectory examples LUX > NTM sector eastbound



Source: Cross-Border FRA Karlsruhe UAC / Maastricht UAC

Summary:

- FUA (Flexible Use of Airspace) – Civil/Mil. Cooperation
- Technology (Radar environment)
- Phases implementation (night -> H24//Levels)
- Flexibility/Adaptability (Sector borders adaptation - MASERATI)
- Transparency
- Benefits (CO2 – Capacity)

- GATE CONCEPT
- PNZ – Zones to avoid due to proximity with adjacent sectors borders
- No particular issue!



To conclude:

More planes,
more data, more
passengers...



Faster, always
faster...



Green, greener,
greenest...



And always SAFE
- Safer – SAFEST!

Looking forward with ambitions !

**Including CO2 emission reduction proposals...
A stable and sustainable project...**

TO ACHIEVE THIS GOAL...

Challenges (will) never stop...

New ideas – new processes will come...

Trying to stop the wave is ill-fated...

Learning to surf the wave is the way ahead...

Professionalism, Engagement, Innovation,
Collaboration, Friendship and Transparency.

LEARN – LEARN – LEARN – LEARN...
TRUST – TRUST – TRUST – TRUST...
SAFE – SAFE – SAFE – SAFER...
EFFICIENCY – EFFICIENCY – EFFICIENCY

**Alone – we cannot
succeed!**

**Free Route Airspaces =
COLLABORATION**



**Safe
More capacity
More performance
More efficiency
Less CO2**





THANK YOU FOR YOUR ATTENTION!



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Question(s)?



Thank You