DYNAMIC RAD,
A NEW PATH TOWARDS FLIGHT EFFICIENCY

FABEC SCO – AOG & CFSPG meeting

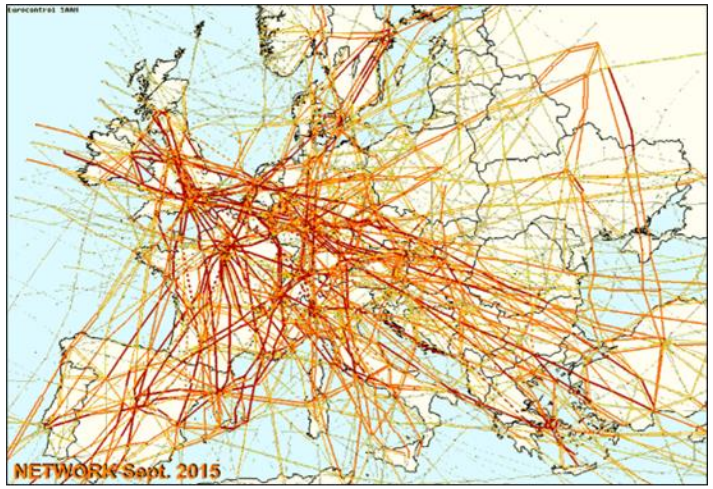
Geneva, 16 May 2023

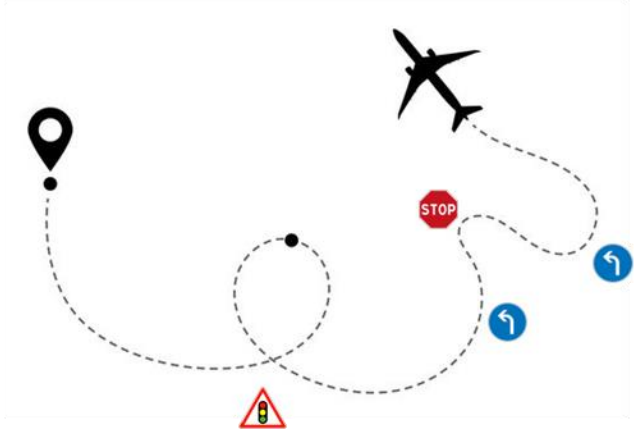
Item 3

MUAC / DFS / ANA / DSNA

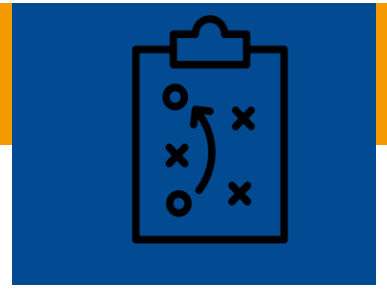
WHAT IS RAD ?

- RAD = Route Availability Document
  - Describes traffic flow rules in Europe
  - Guides flows, ensures safety, reduces complexity
- Around 3,000 RAD in France
- Published by the Network Manager for each AIRAC cycle



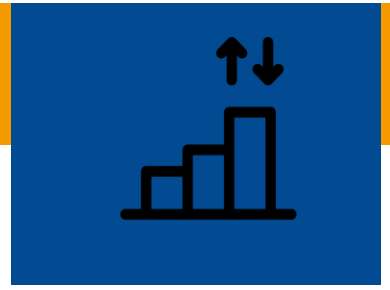


WHAT ARE THE LIMITS ?

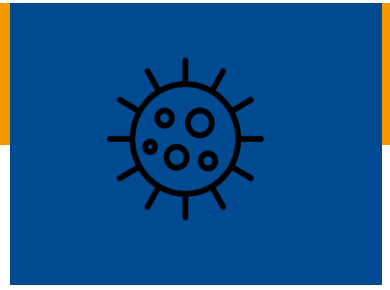


Strategic measure

Static and fixed in advance



Not always aligned with rapid traffic evolution



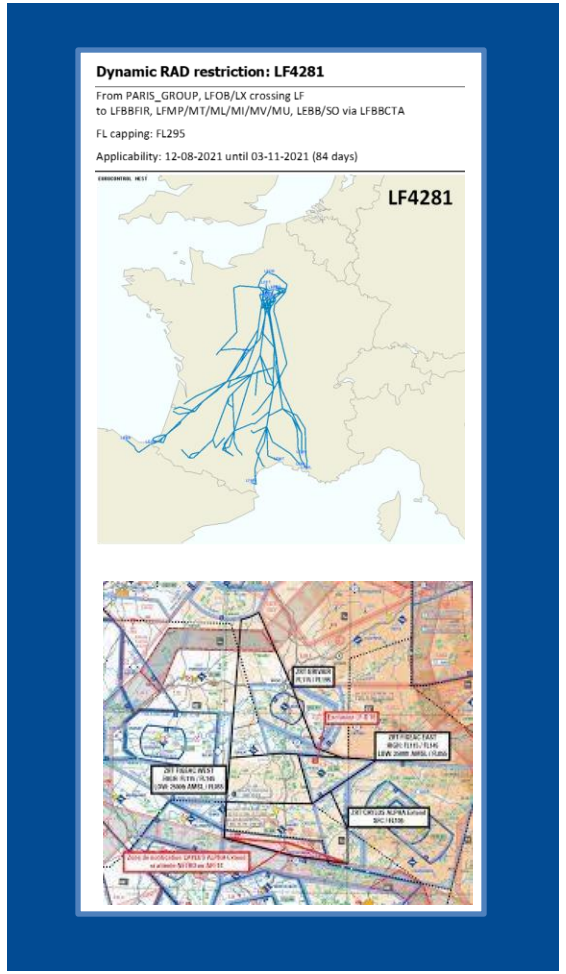
COVID-19 crisis exacerbates the need to ease flight planning

WHAT IS DYNAMIC RAD CONCEPT ?

RAD measure → ON / OFF → AUP update

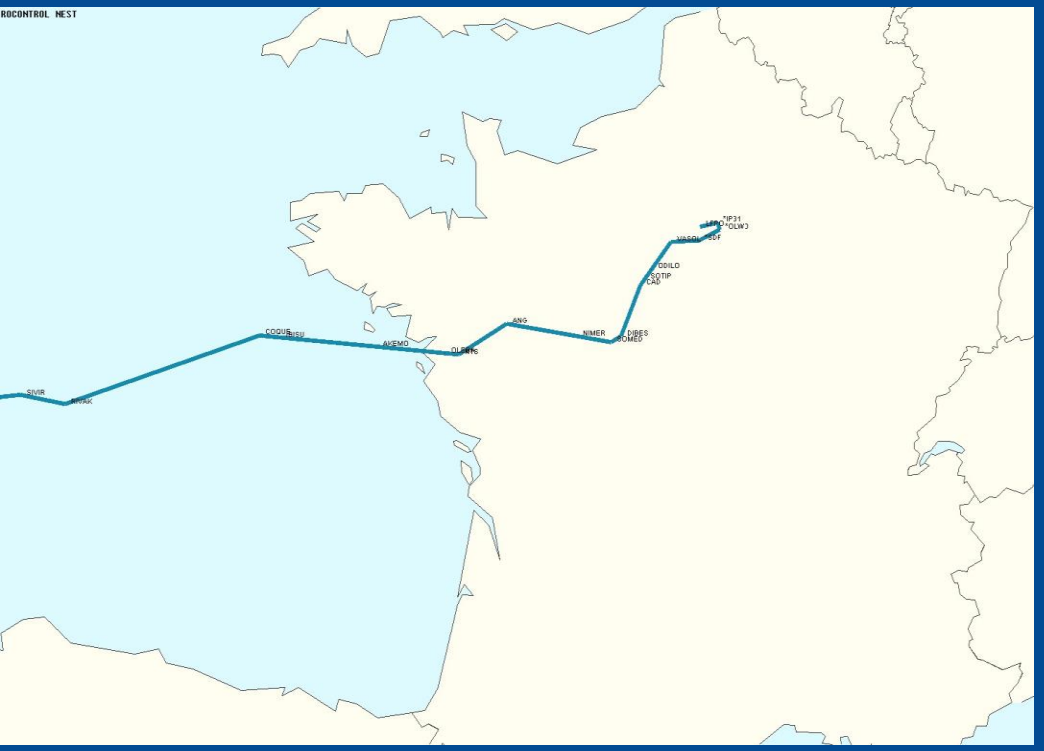
- Introduce dynamicity into the RAD on daily basis
- Use AUP to activate/relax RAD measure at D-1
- Allow to better adapt constraints to traffic evolutions

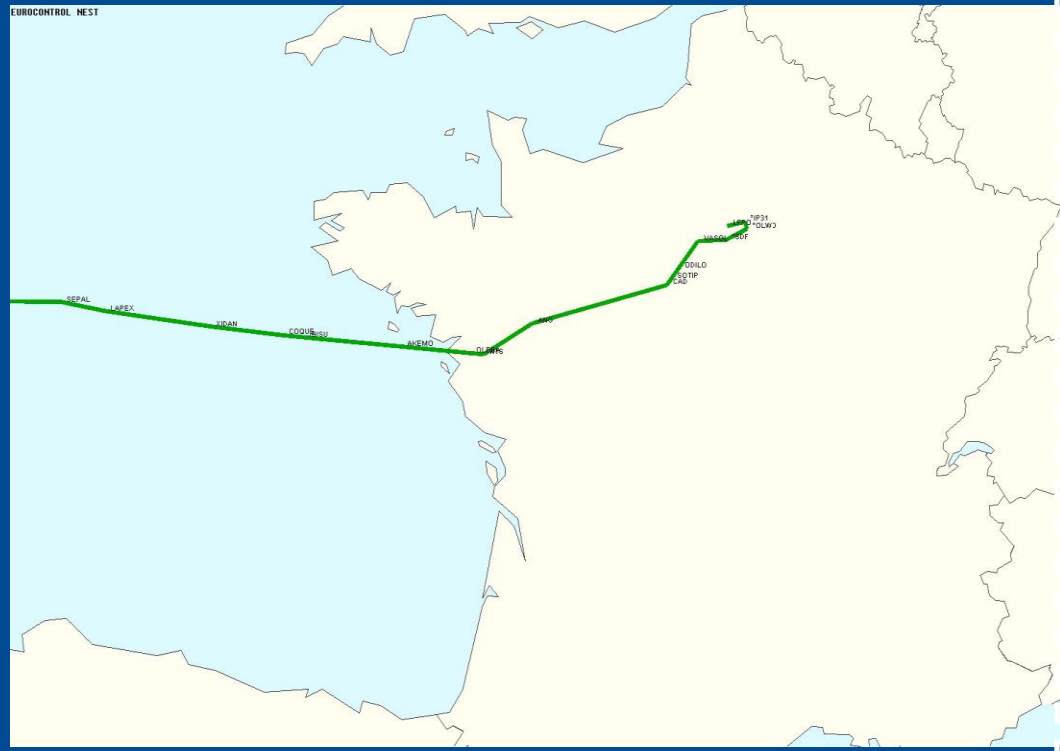
Dynamic RAD concept proved to be feasible allowing to make more direct and more sustainable flights



EXAMPLES

DYNAMIC RAD restriction: LF5228





EXAMPLES

DYNAMIC RAD restriction: LF4234

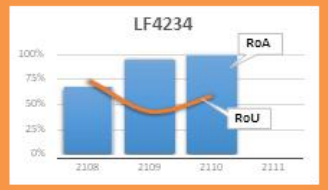
Dynamic RAD restriction: LF4234

From BASTIA_GROUP, LFKO crossing LF to ROISSY_GROUP, LFOB

FL capping: FL365

Applicability: 12-08-2021 until 03-11-2021 (84 days)

Eligible flights:	103
Acceptor flights:	62
Days RAD active:	14
Actual fuel saved:	1.85 t
Potential fuel savings:	3.10 t
Actual CO2 reduction:	5.84 t
Potential CO2 reduction:	9.75 t
RoA= 87.4%	
RoU= 59.2%	



DYNAMIC RAD restriction: LF4281

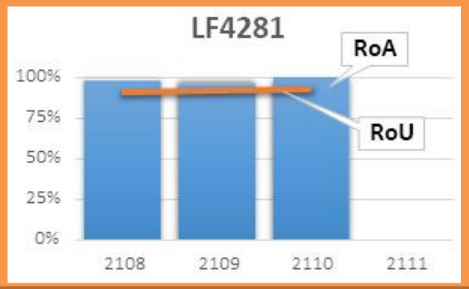
Dynamic RAD restriction: LF4281

From PARIS_GROUP, LFOB/LX crossing LF to LFBBFIR, LFMP/MT/ML/MI/MV/MU, LEBB/SO via LFBBCTA

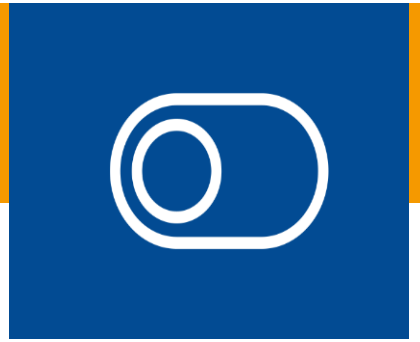
FL capping: FL295

Applicability: 12-08-2021 until 03-11-2021 (84 days)

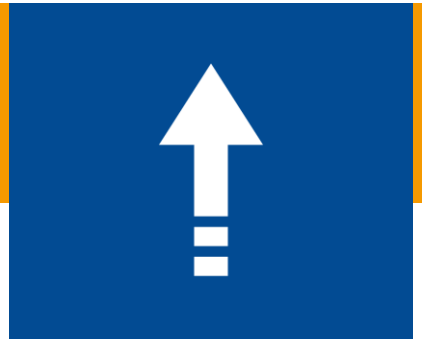
Eligible flights:	6288
Acceptor flights:	5797
Days RAD active:	1
Actual fuel saved:	388.8 t
Potential fuel savings:	421.8 t
Actual CO2 reduction:	1224.8 t
Potential CO2 reduction:	1328.7 t
RoA= 99.6%	
RoU= 92.1%	



DYNAMIC RAD : WHAT IS THE WAY FORWARD ?

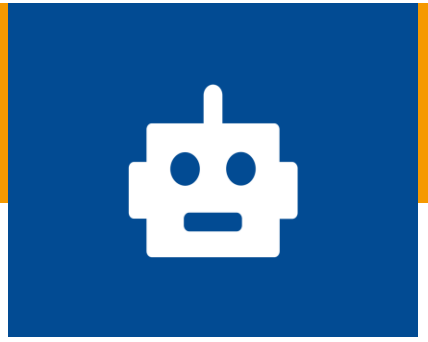


Maintain a regular use of Dynamic RAD concept



Improve the measure selection in a CDM process

Improve collaboration and communication with CFSPs



Improve technical operations and automation

Dynamic RAD @ MUAC

FABEC SCO – AOG & CFSPG meeting

Geneva, 16 May 2023

RAD Restrictions within FABEC

Kris Scicluna, MUAC

Introduction

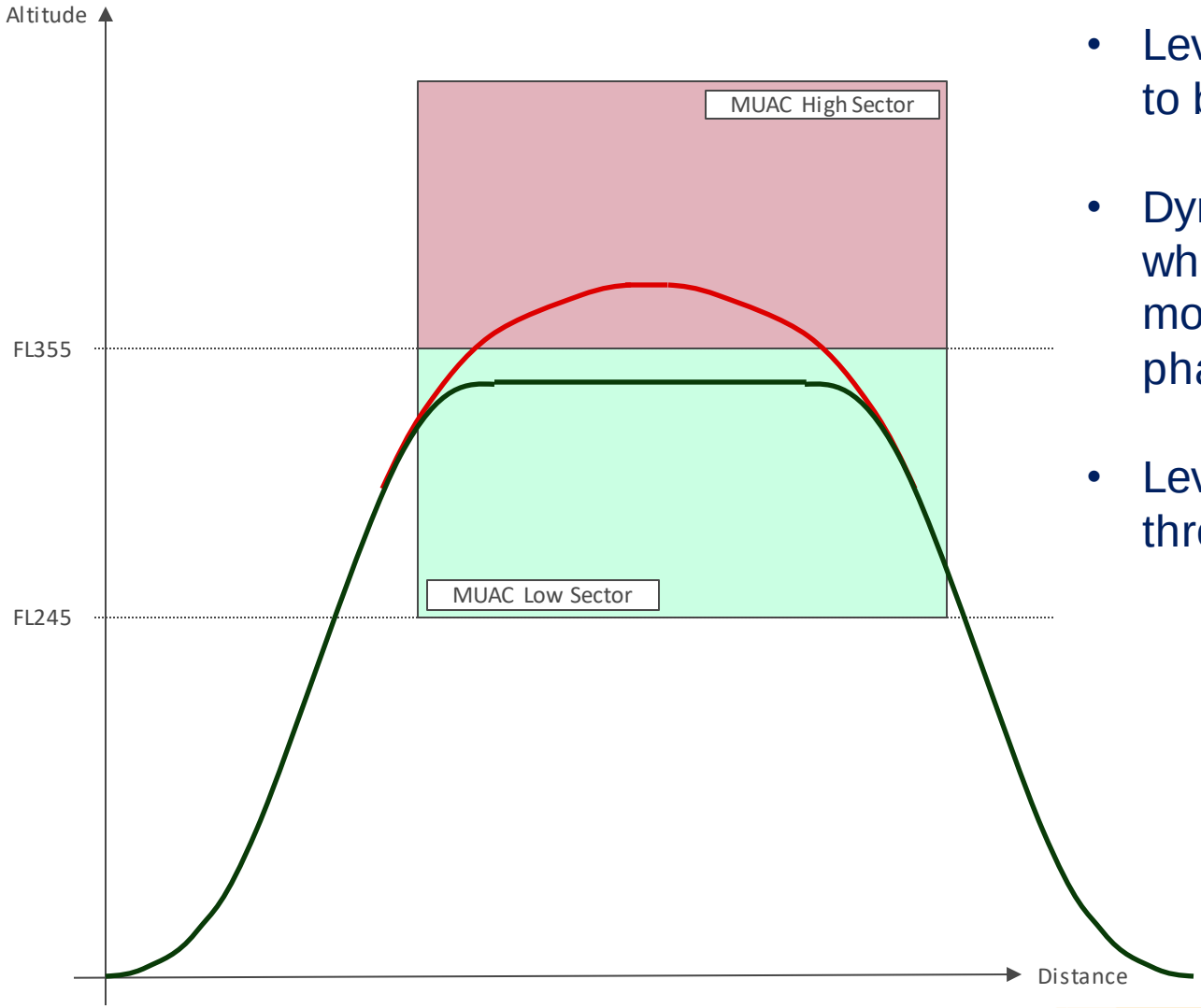
- MUAC started activities to prepare for Dynamic RAD usage.
- Trigger to start the activities were the technical changes to be introduced in NM Release 27.
- Operational Use Cases have been identified. Development activities focus on:
  - Processes to assess the effects of Dynamic RAD during pre-tactical / tactical phase.
  - Processes to coordinate the application of Dynamic RAD with adjacent ANSPs and NM.
  - Technical upgrades of MUAC's FMP tools.
  - End-user training.

Overview on Use Cases for Dynamic RAD

Use Case	(1) Sector Configuration	(2) Airspace Availability	(3) Demand / Capacity Balancing	(4) Special Events
Objective	Apply routing restriction / flight level capping when a specific sector configuration is planned.	Apply routing restrictions to ensure that traffic flows make use of available airspace which is not allocated to military use.	Apply routing restriction / flight level capping to ensure that traffic flows avoid overloaded sectors or use underutilised capacity.	Dynamic RAD used for temporary / special events • Military Exercise • Sport Events • etc.

Selected for initial development focus

Use Case (1) - Sector Configuration

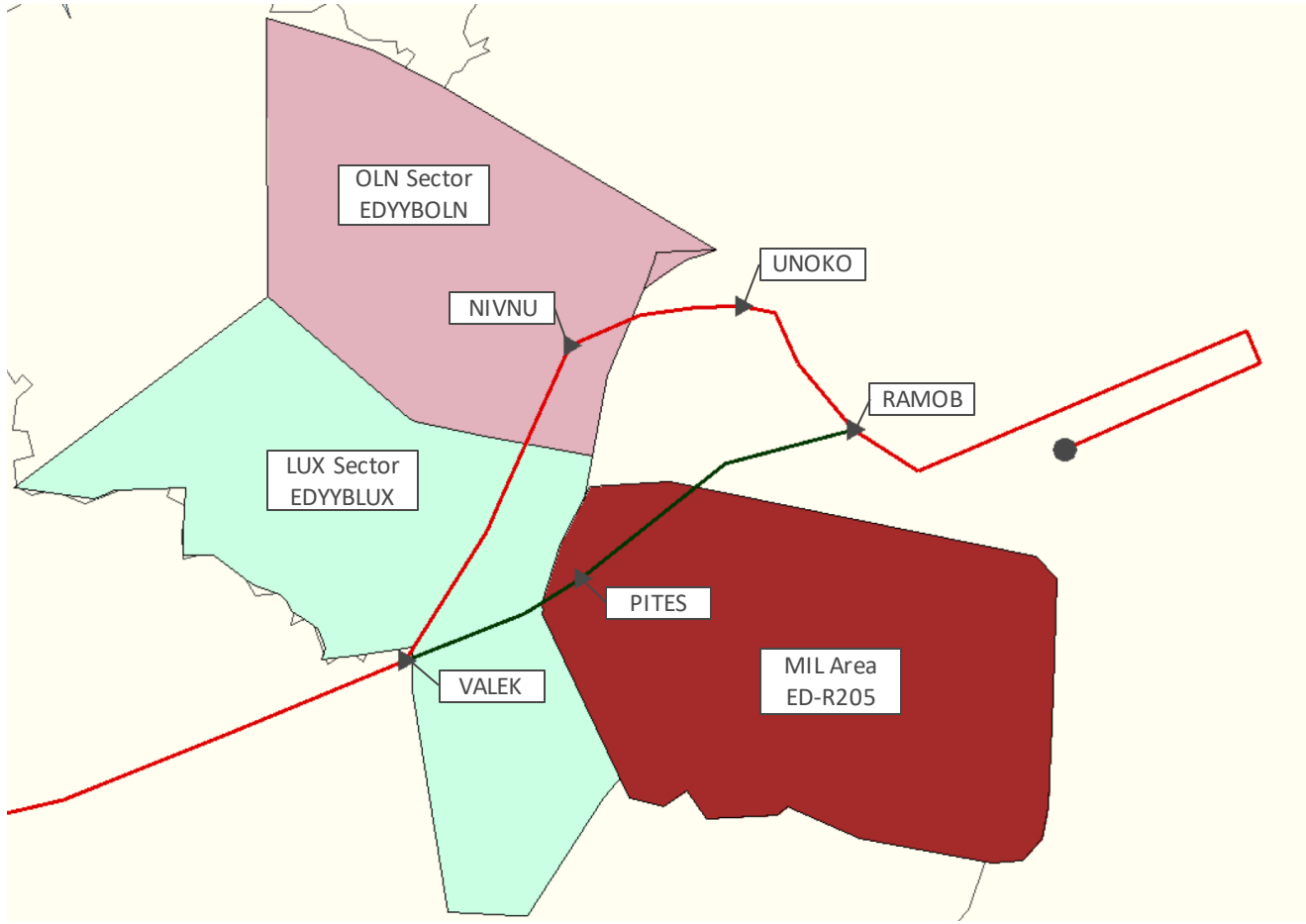


- Level Capping applied when sectors are planned to be split vertically.
- Dynamic RAD achieves that the decision making whether and when to apply the level capping is moved from strategic to pre-tactical planning phase.
- Level Capping will hence be applied less throughout the year.

Use Case (2) - Airspace Availability

- Dynamic RAD applied to the route which does not make use of available airspace.

Forbidden	Mandatory
EDYYBOLN Not avbl for tfc ARR EDDF via VALEK	PITES Compulsory for tfc ARR EDDF via VALEK



- Dynamic RAD achieves that …
  - Route is making best use of available airspace
  - Demand reduced on MUAC OLN sector
  - Predictability is increased
- Applicability of Dynamic RAD is explicitly published in AUP.
  - This may overcome the CFPS's challenge regarding dependant applicability RADs.

ATFCM Scenario vs Dynamic RAD (ANSP point of view)

	ATFCM Scenario	Dynamic RAD
Flexibility	High flexibility to implement / withdraw scenarios due to short lead-times.	Changes depend on UUP process, its frequency and lead-times.
Predictability	Low influence on re-route. Scenario description contains re-route advise.	Re-route can be better described or specific routes can even be mandated.
Scope	Can only impose a restriction to address over-demand at certain point / volume.	Restrictions can be imposed or relaxed; also addressing structural traffic flow rules.
System Support	Not supported by all CFSP systems which imposes effort for OCCs.	Built on existing RAD framework but with new information flow process.

Discussion on Use Cases

- MUAC intends to start using Dynamic RAD by winter 2023 /2024.
  Are your Flight Planning Systems ready to process Dynamic RAD?

- MUAC is aware of the complexity in the RAD and we continuously review our contribution to it.
  Do you expect that Dynamic RAD in general and presented Use Cases will reduce it?

- MUAC considers Use Cases in which a routing is mandated to avoid creating a regulation.
  What is your point of view regarding Mandatory Routing?

- MUAC intends that AMC Netherlands is publishing MUAC's Dynamic RADs.
  Do you see an issue with that or is it transparent for you since all national contributions are collected in the Network Manager's eAUP/eUUP?

RAD @ ELLX

FABEC SCO – AOG & CFSPG meeting

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RAD Restrictions within FABEC

Claude Schmit, ANA Luxembourg

RAD restrictions issued by ELLX

Result List on 25-Apr-2023 10:13:47 [No filter applied - 5 items]

Ann 2A 0 | Ann 2B 0 | Ann 2C 0 | Ann 3A 5 | Ann 3B 0

Change Ind.	ID	Utilization	DMR
☑	EBEL5500	DEP | ELLX | ASMOX, DIK, EXCOS, GTQ, MMD, RAPOR COMPULSORY FOR TRAFFIC with RFL above FL055	EB_2104
☑	EBEL5501	ARR | ELLX | AKELUARCKY BETEX DIK EXCOS GIVOR GTQ IRTON KOMOB LNO MAPIG MMDOLIVIOXCAMPONIGREMBARITAXVAVOT COMPULSORY FOR TRAFFIC with RFL above FL055	EB_2203_INCR_A
☑	EL_TP	The use of SIDs/STARS is compulsory for traffic DEP/ARR ELLX with RFLabove FL055 H24	EB_2104
☑	EL5500	DEP | ELLX | GTQ COMPULSORY FOR TRAFFIC ARR LFJL	
☑	EL5501	DEP | ELLX | EXCOS NOT AVAILABLE FOR TRAFFIC Except	

Extracts from CCS Report in relation to ELLX

Flight Efficiency/Route Restrictions:

- Not enough initiatives regarding flight efficiency given all the restrictions that are in place and the increased complexity of them (Luxembourg mentioned specifically)

RAD restrictions: **

- The biggest concern for airlines by a considerable margin is RAD routes, with difficulties mentioned with the tool used for finding the most efficient and legal routes. Specific areas of difficulty are internal flights in Germany, cross-border France Germany/Swiss and access to ELLX.

General satisfaction

Key issues: Route structure too inefficient in/out of LUX, too many slots, too many route detours due to RAD constraints

Key ANS challenges: German airspace restrictions

ANSP performance view:

Positive:

skyguide skeyes LVNL

cargolux

No particular view:

DFS Deutsche Flugsicherung

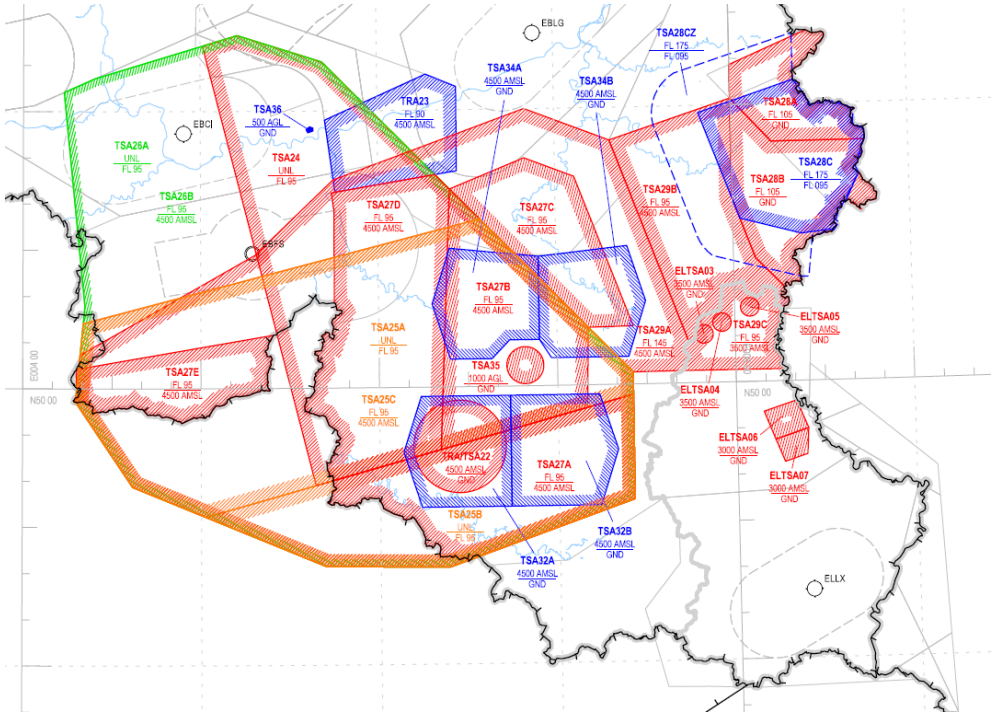
Negative:

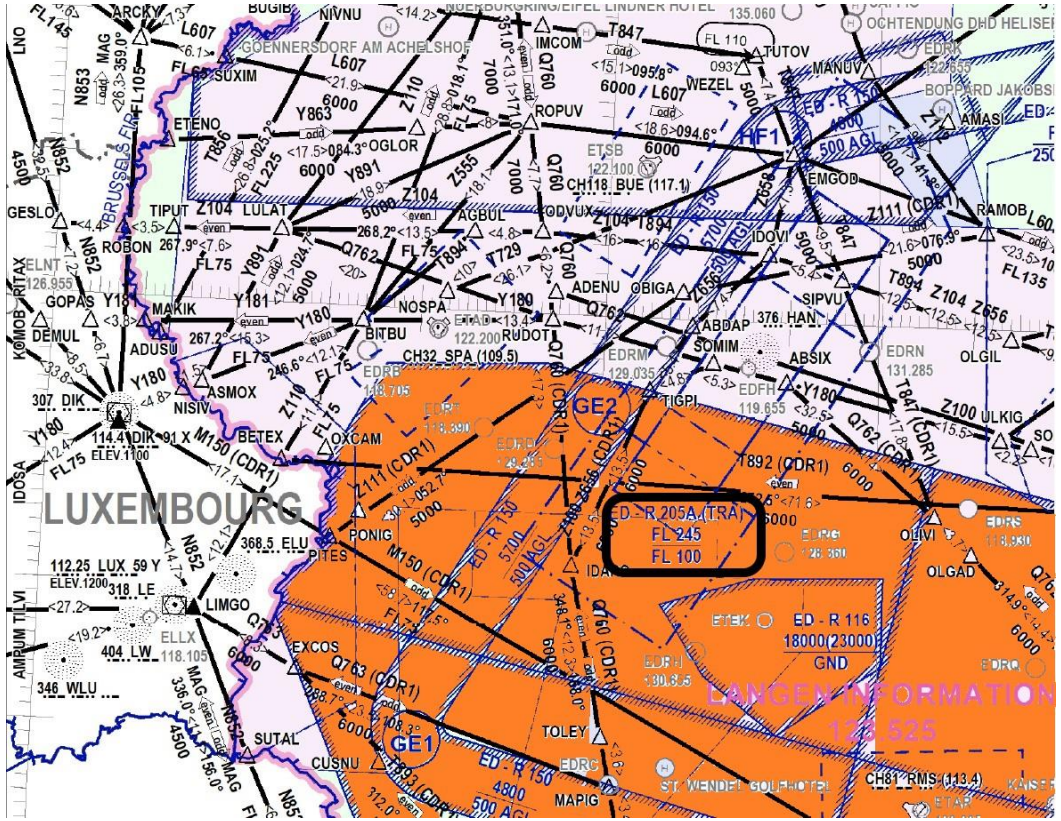
ANA Administration de la navigation aérienne

EUROCONTROL

dgac DSNA

Arrival restriction inbound ELLX

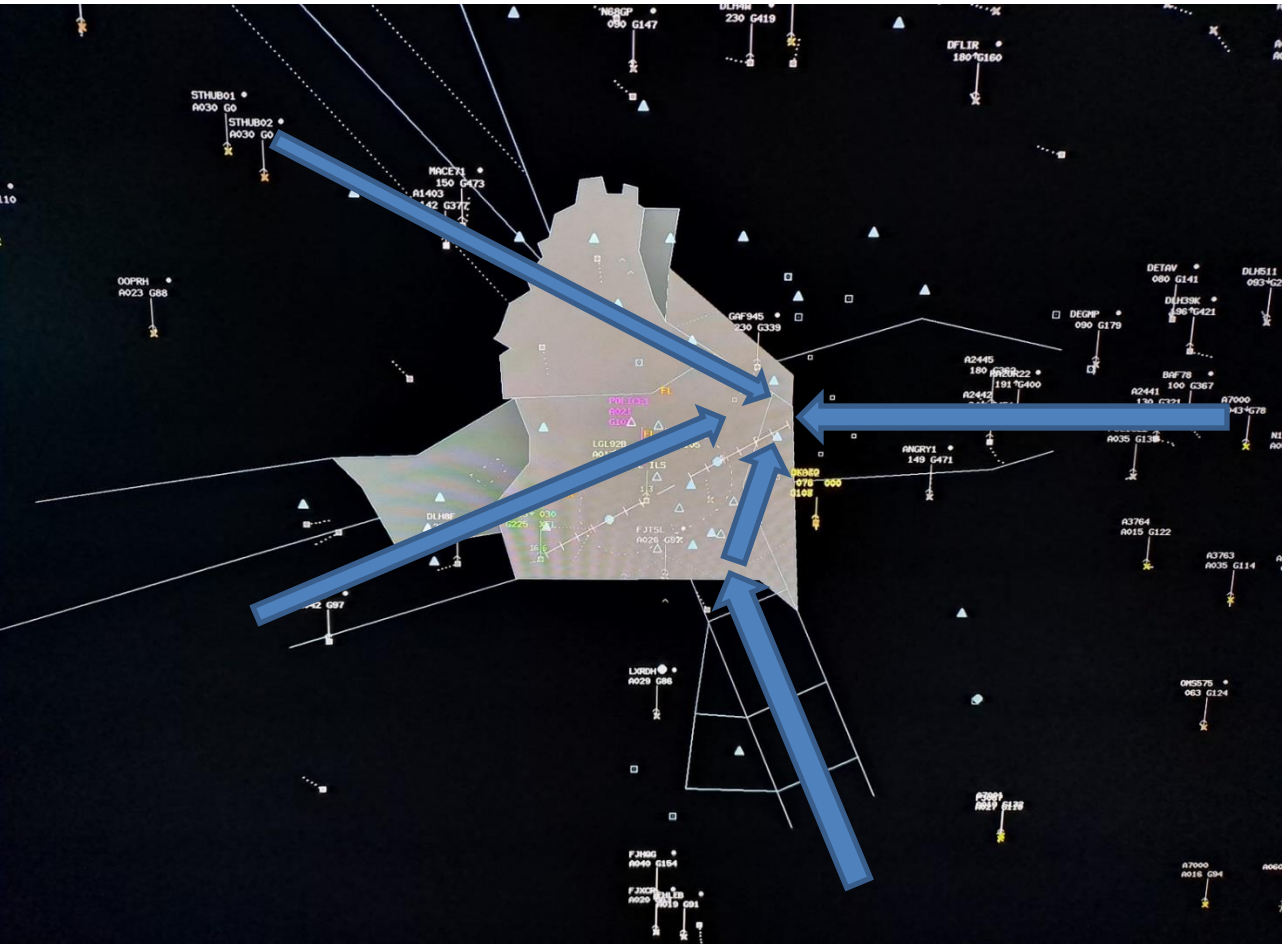




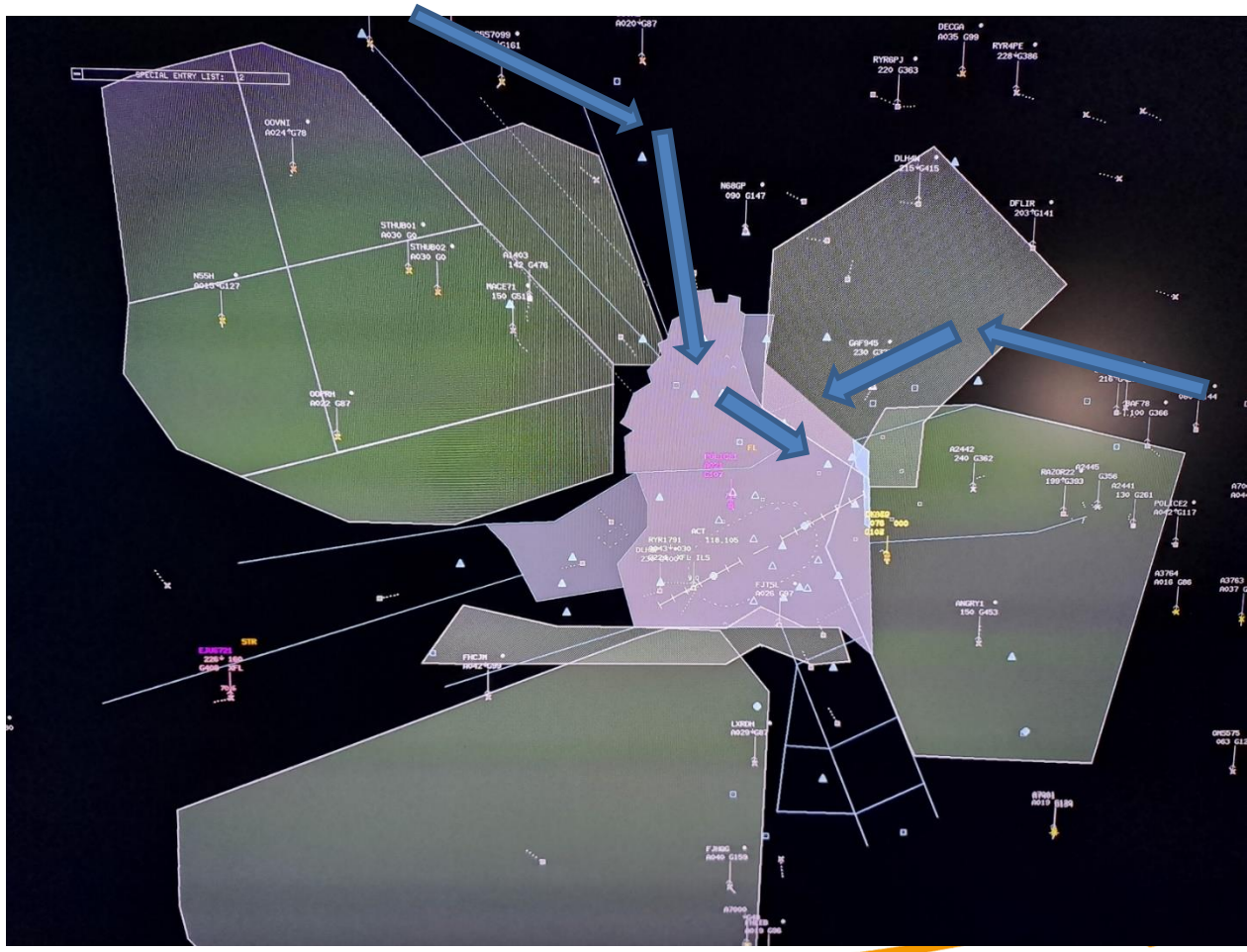
Military airspace NE Luxembourg/Belgium

Military airspace E Luxembourg/Germany

Direct routings to RWY24 Mil-Off



Routings to RWY24 during Mil-On



Questions & discussions