

DFS Free Route Airspace – Findings Solution 1 01MAR2018 & Outlook

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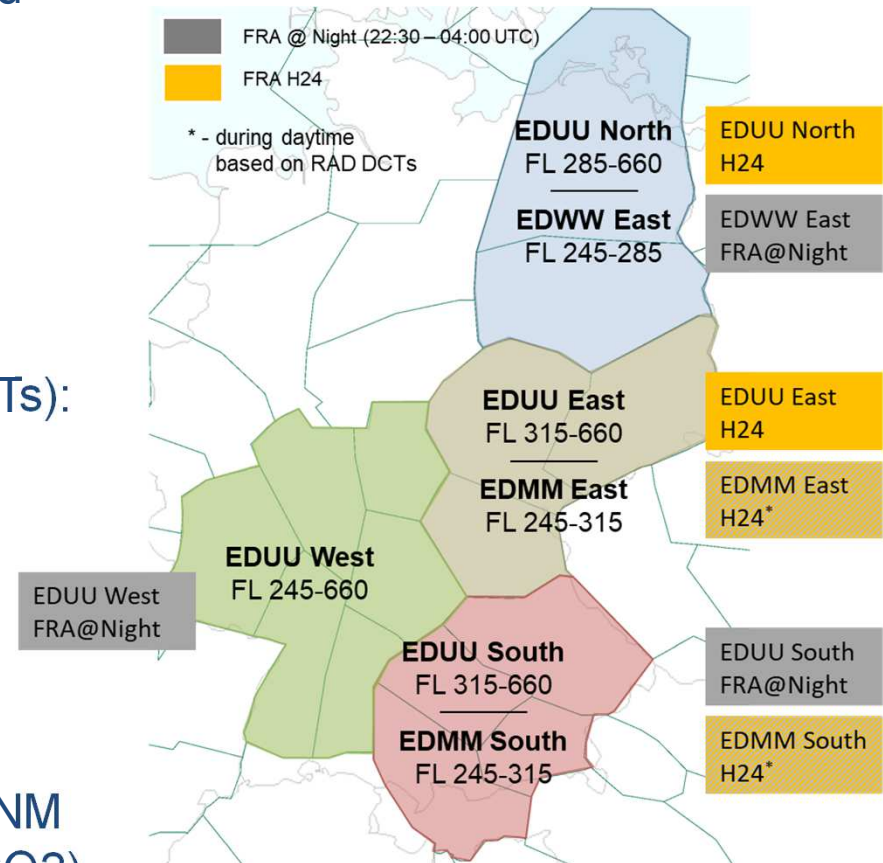
NM FRA Workshop, 24-25/05/2018, Brussels



DFS Deutsche Flugsicherung

DFS Free Route Airspace

- On THU 01MAR2018 DFS implemented FRA Solutions
 - 1A FRA @ Night
EDUUW, EDUUS, EDWWE
 - 1B FRA H24
EDUUN, EDUUE
(during daytime through RAD DCTs):
EDMME, EDMMS
- Potential Benefit (NM):
 - > 310.000 eligible flights per year
 - FPL route length reduction by 3,12 NM per flight (\cong 5.890 t fuel / 19.634 t CO₂).



Pre-Validations' Findings

- Joint testing: FPLs calculated by CFSPs ensured variety of random routes
- Connecting Routes
 - RAD representation (complexity, specific RAD rules' types)
 - Vertical profile (RAD vs. PTRs)
 - Length of compulsory segments
 - Congruence of ATS routes upper / lower airspace
- Efforts
 - Number and extent of validations (7 DFS FRA Cells)
 - Resource limitations

Cutover Findings DFS, ANSPs, NM

- No issues from OPS-side (ATCO, Flight Data).
- No circumnavigation around FRA Cells but quite a lot (and until now several) „crazy routings” mainly due to CFSP limitations when calculating FPLs based on new options, restrictions or ATS route updates.
- Despite of regulation in Karlsruhe UAC (01MAR2018: -15% 0000-1000 UTC, -10% 1000-1100 UTC), no ATFM delay due to FRA cutover

Adjacent ANSPs

- No reports

NM

- „very smooth transition“

Cutover Findings CFSPs

- FRA Night DCTs are implemented by CFSPs step-by-step
- Slight performance degradations due to the number of new route options
- With some CFSPs:
 - Erroneous routing proposals
 - Need for support prior to cutover to prevent from FPL rejections regarding correct handling of
 - RAD Restrictions
 - Connecting Routes (RAD Pan Europe)
 - Profile Tuning Restrictions (PTRs)

Lessons learnt from FRA Solution 1

Success factor:

- High level of acceptance on operational side as transition towards FRA H24 followed some years of familiarisation with RAD APP 04 DCTs

Unplanned activities / demands:

- Publication changes until Cutover due to pre-validation findings
- Additional Pre-validations at NM:
 - Ramp-up after NM Release 21.0
 - Complexity of RAD Restrictions
- Support needs from CFSPs.

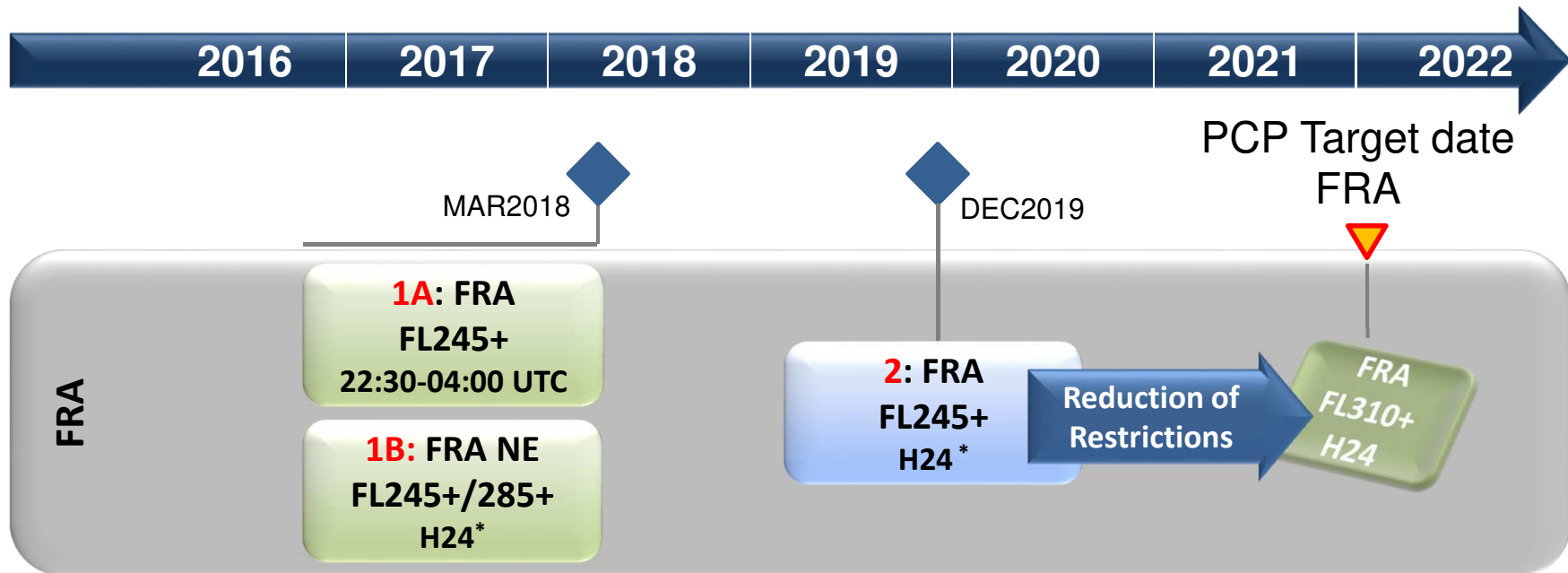
Requirements for DFS FRA Solution 2

Considering the lessons learnt from FRA Solution 1 for FRA Solution 2 (FRA H24 DEC 2019) DFS sees

- preceding implementations of **RAD APP 4 DCTs** in EDUU West and South as a key factor for a smooth transition and sufficient operational acceptance.
- higher workload related to **ATS route changes** due to the complexity of route structures in the Core Area.
- higher **potential impact of risks** in the Core Area.
- increased need for **stability of the implementation package** with longer lead time before cutover.
- the need for **involvement of NM and CFSPs** in the design phase.
- the need for **in-depth testing and pre-validations** in a joined manner with NM and CFSPs before design freeze.

⇒ **Therefore, DFS restructured the implementation of FRA Solution 2**

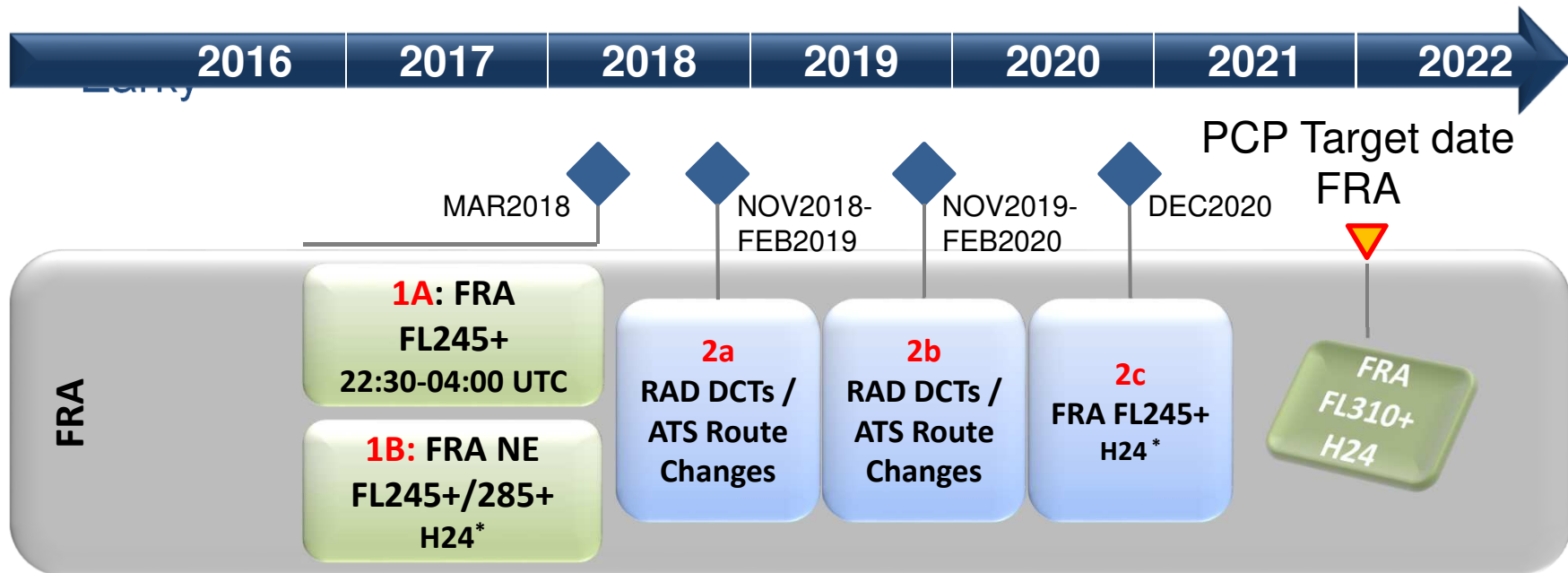
DFS FRA Roadmap up to now



- Solution 1: MAR 2018
 - FRA @ Night
 - FRA H24 in the North-East
- Solution 2: DEC 2019
 - FRA H24 FL245+ DFS-wide

* In daytime Bremen ACC und Munich ACC will offer FRA by means of RAD APP 4 DCTs.

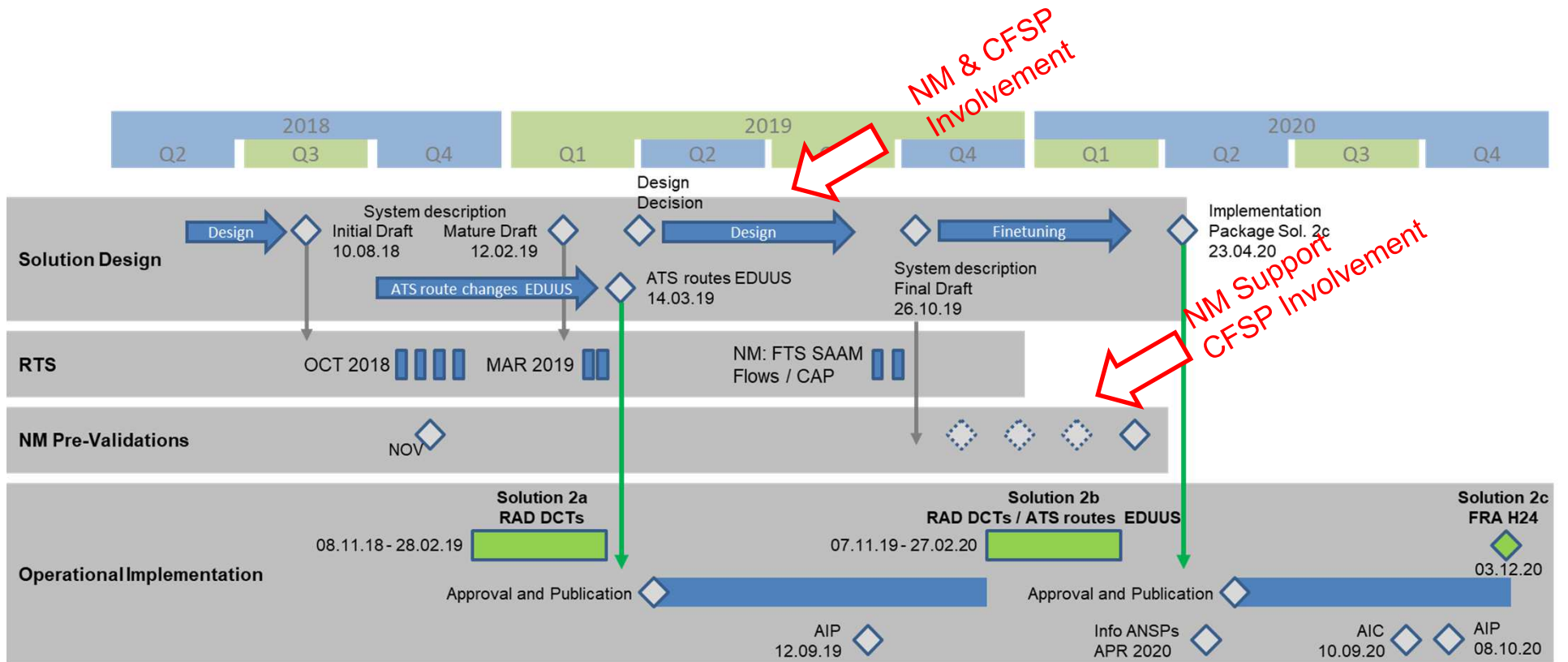
Modified DFS FRA Roadmap



- Solution 1: MAR 2018
 - FRA @ Night
 - FRA H24 in the North-East
- Solution 2:
 - a - W 2018/19 RAD APP 4 DCTs + ATS Route Changes
 - b - W 2019/20 RAD APP 4 DCTs + ATS Route Changes
 - c - DEC 2020 FRA FL 245+ H24

* In daytime Bremen ACC und Munich ACC will offer FRA with compulsory intermediate points or by means of RAD APP 4 DCTs.

DFS FRA Milestones



General Remark

- In the FABEC FRA Workshop, 09/05/2018, a discussion took place concerning complexity of the RAD and processing of RAD restrictions.
- The workshop called for the provision of best practices or – more beneficial – binding agreements for phrasing of RAD rules.
- A reliable automatic processing of RAD rules requires a machine-readable RAD and respective technical standardisation.

Thank you very much for your attention!



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