Briefing “DFS FRA H24”

16/12/2020

Member of the
FABEC Free Route Airspace Project

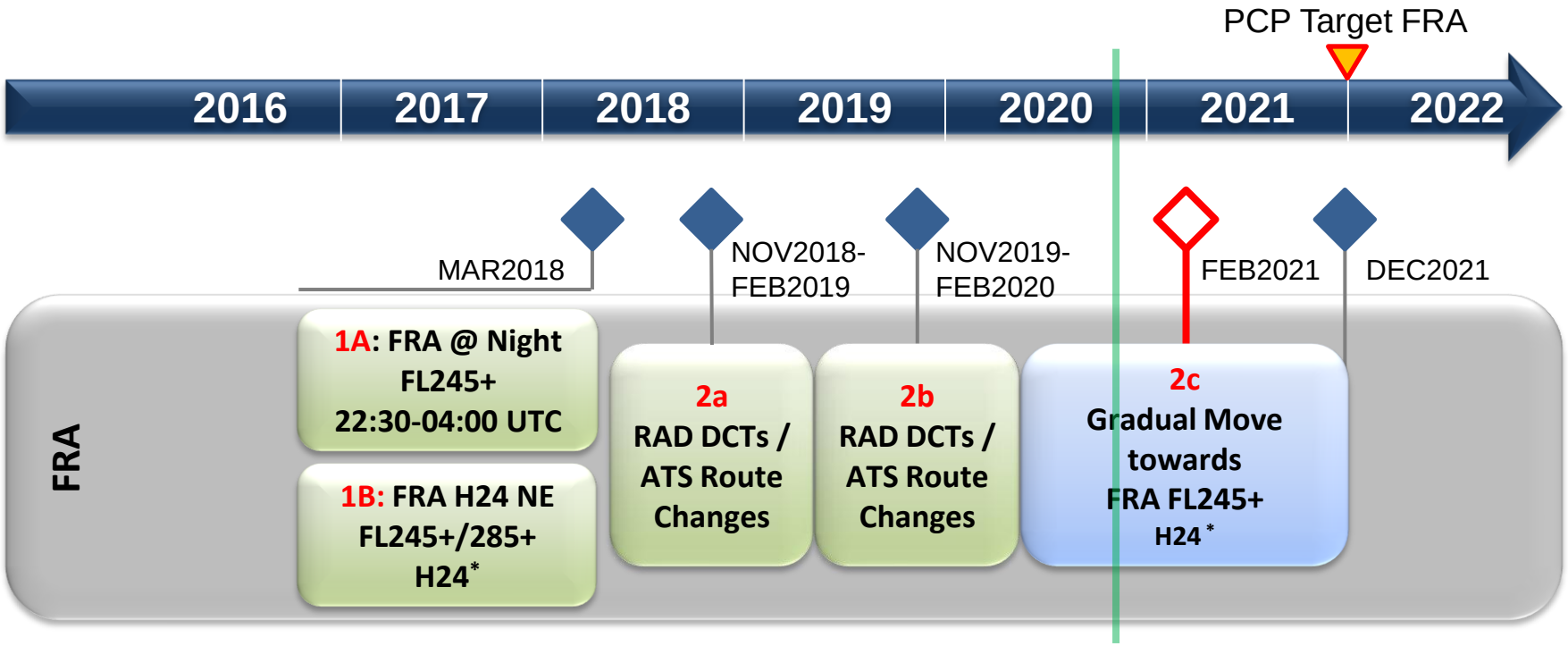
DFS Deutsche Flugsicherung

Co-financed by the European Union
Connecting Europe Facility

Objectives

- To inform CFSPs and AOs about the DFS FRA H24 implementation (25 FEB 2021)
- To provide information about support activities of DFS in connection with AIRAC 2102
- To clarify open questions of CFSPs and AOs

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 - JUN 2020-DEC 2021 Gradual Move towards FRA FL 245+ H24; AIP in FEB 2021

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

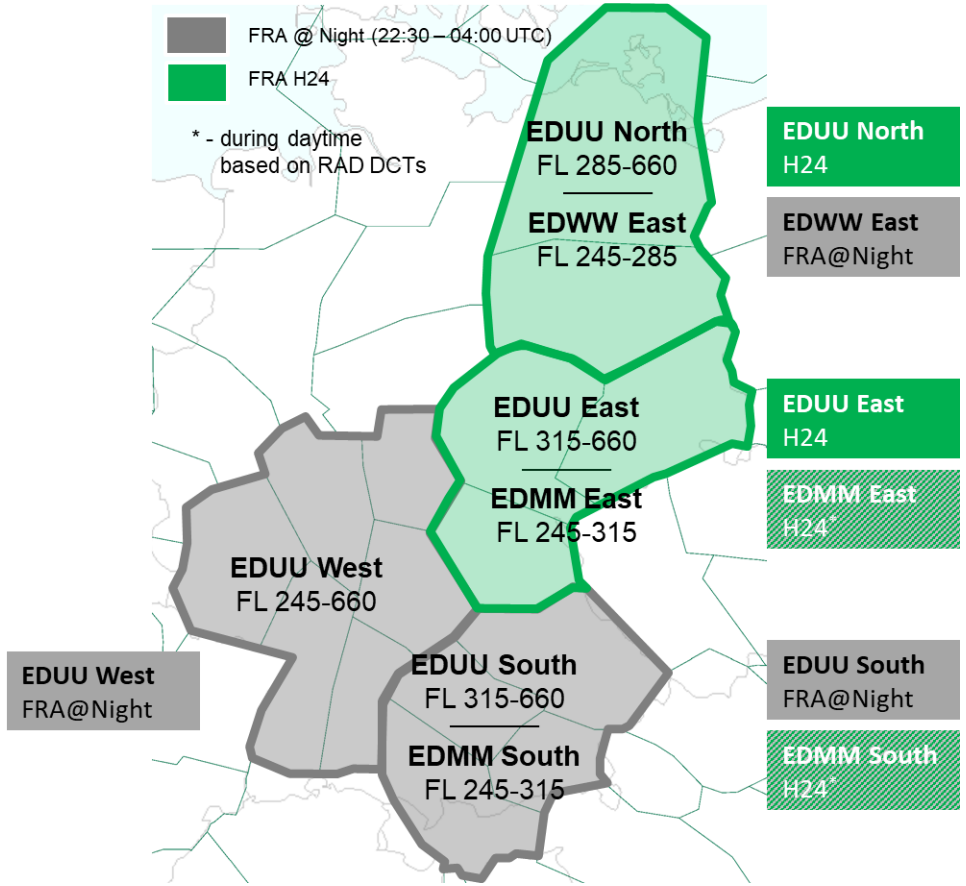
Previously on DFS FRA…

DFS Deutsche Flugsicherung

DFS Free Route Airspace Implementation Solution 1 (01MAR2018)

- **01MAR2018: Successful implementation**
  - **1A FRA @ Night**
    EDUUW, EDUUS, EDWWE
  - **1B FRA H24 NE**
    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**
    (≙ 5.890 t fuel / 19.634 t CO2 per year).



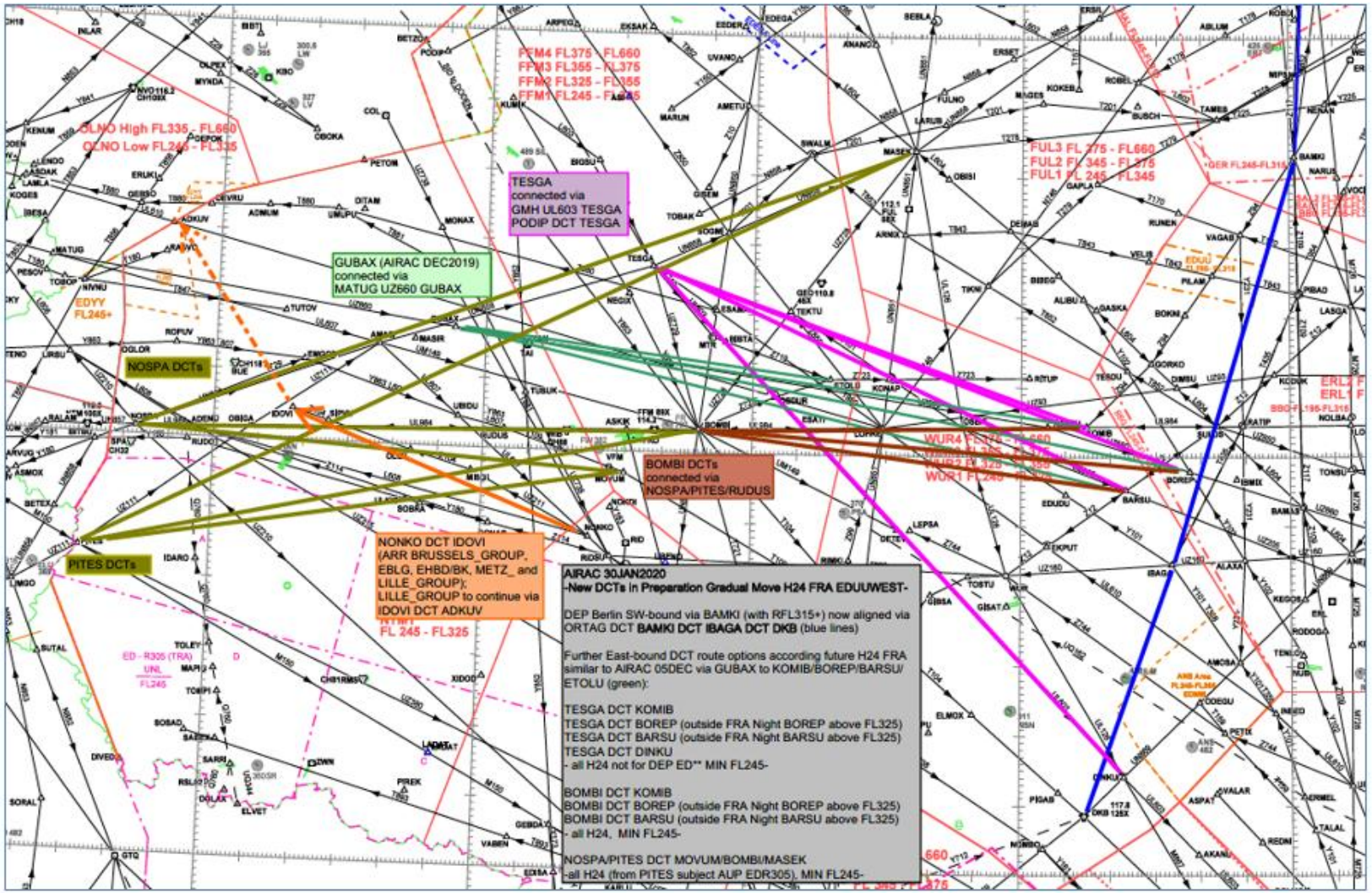
DFS Deutsche Flugsicherung

DFS' response to Capacity Issues in 2018/19: „Gradual Move towards FRA H24"

- FRA implementation approach „Gradual Move…" describes a step-/flow-wise opening of FRA points (thus DCT options) to H24.
- FRA is structurally limited, based on current flows but offers additional options
- Gradual Move does not require simulation-based training and should ease implementation for CFSPs (gradually added RAD APP04 DCTs form the basis of the H24 FRA network).

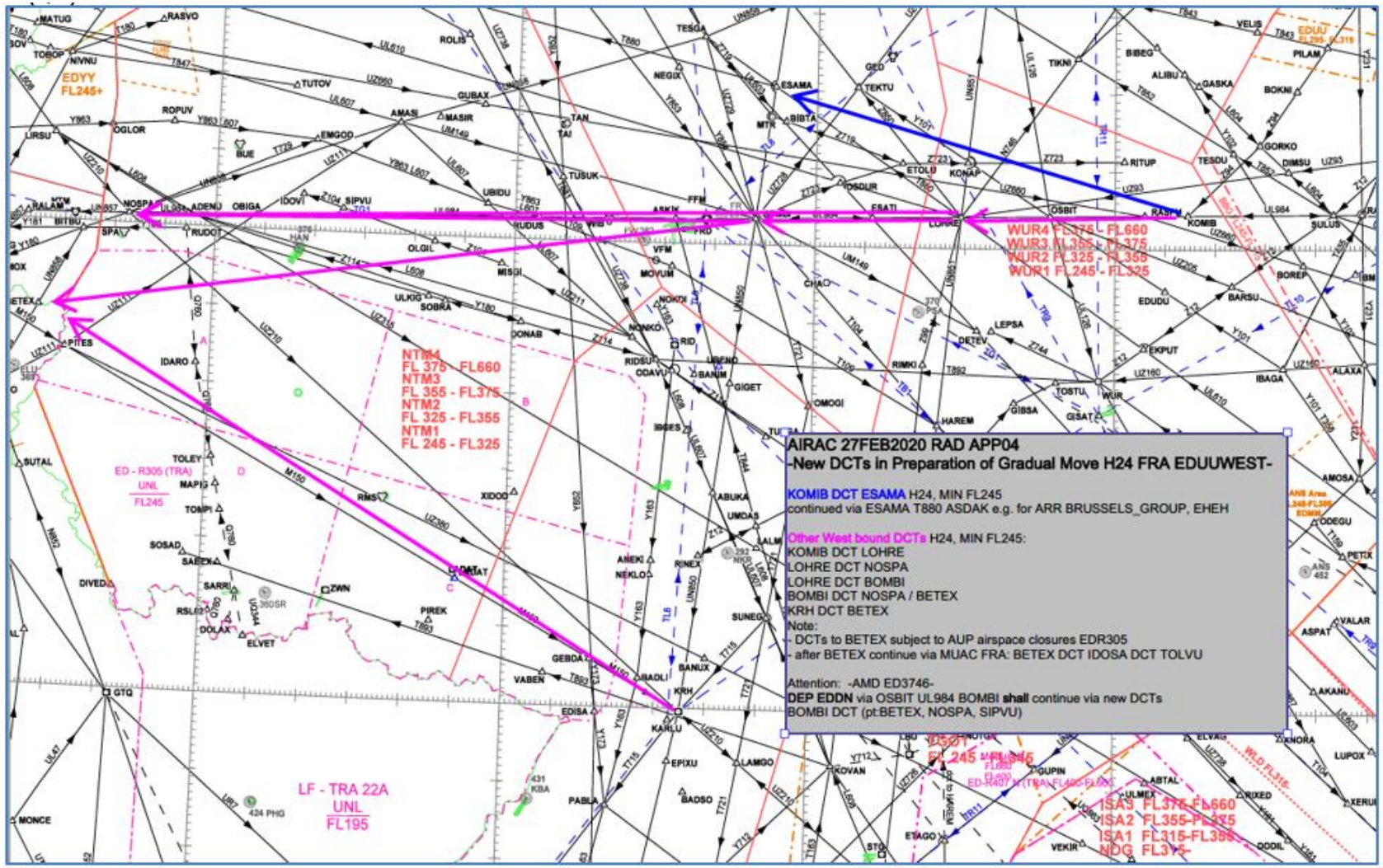
until DEC 2020	*FEB 2021*	*until DEC 2021*
RAD: • Publication RAD APP 04 DCTs H24 • Forcing of existing flows along point sequences **AIP:** • ATS route changes	**AIP:** • Publication FRA H24 EDUU West & South **RAD:** • Flow-wise H24-AMD of individual E/X/I points.	**RAD:** • Flow-wise H24-AMD of individual E/X/I points.
Operational tests of FRA DCT options in EDUU South (INBED/CHI) -RTS 2018/20 and RAD-		

„Gradual Move towards FRA H24“ - AIRAC 30JAN2020



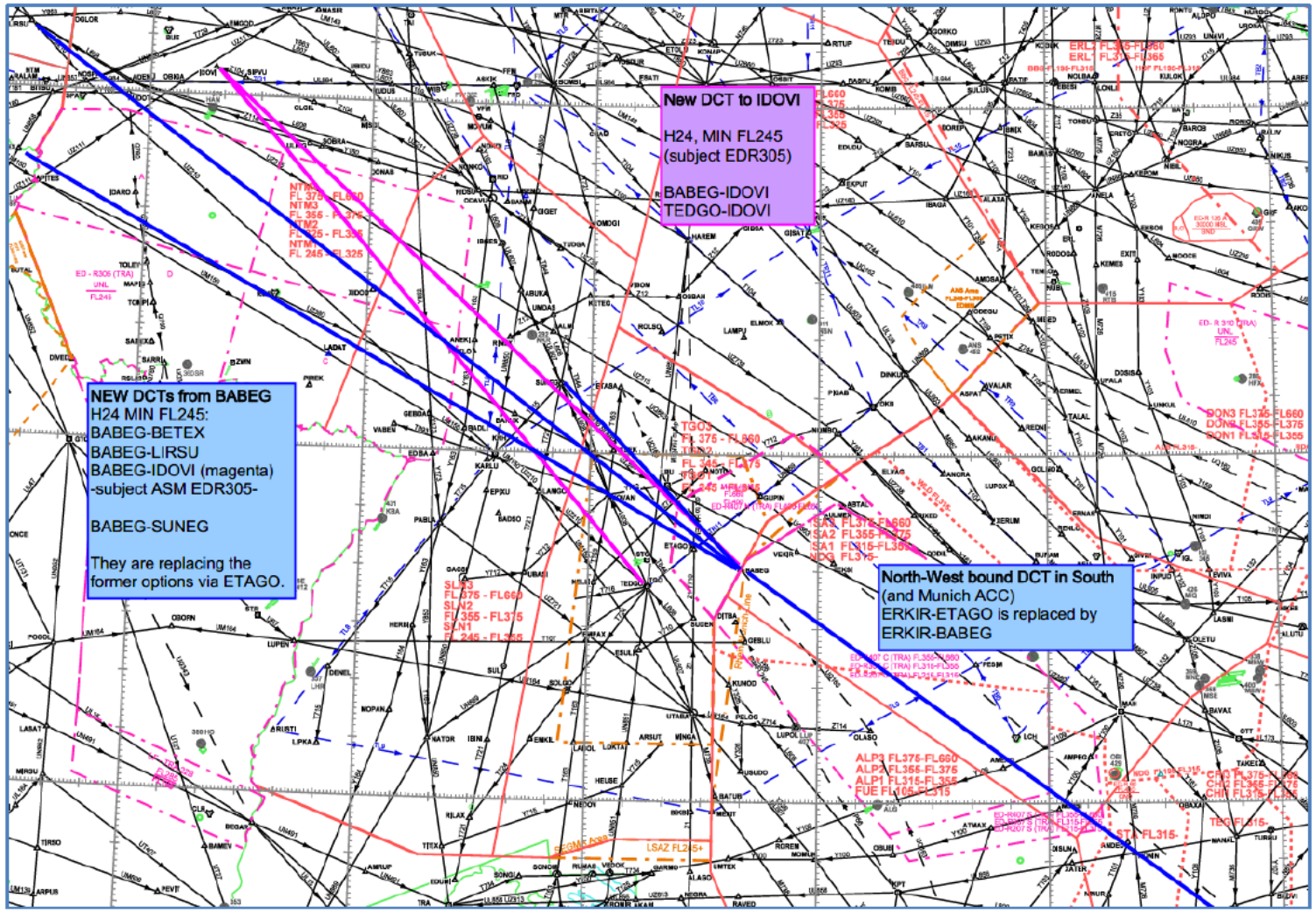
DFS Deutsche Flugsicherung

„Gradual Move towards FRA H24“ - AIRAC 27FEB2020

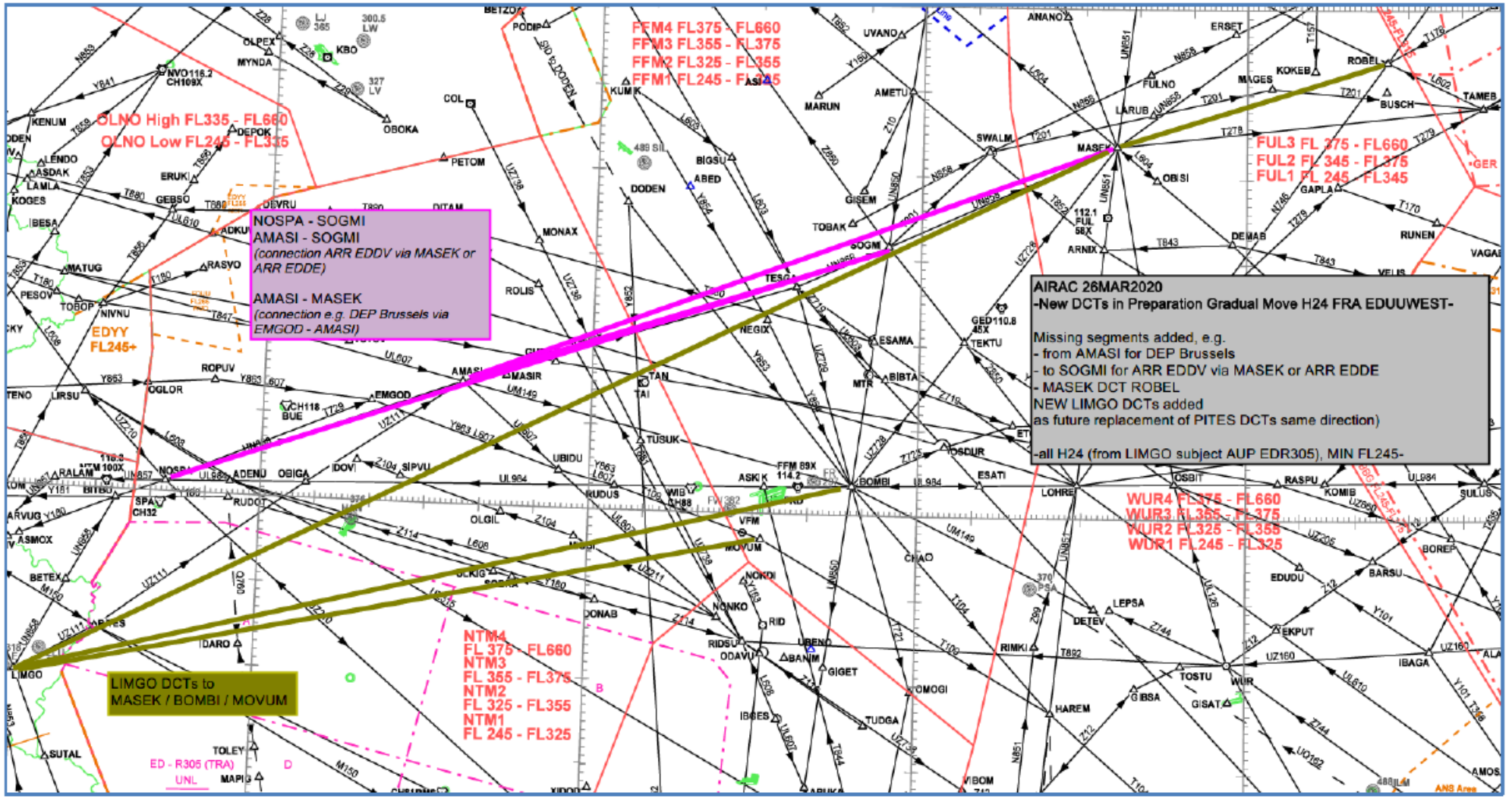


DFS Deutsche Flugsicherung

„Gradual Move towards FRA H24“ - AIRAC 26MAR2020



„Gradual Move towards FRA H24“ - AIRAC 26MAR2020



DFS Deutsche Flugsicherung

Coming Now…

DFS Deutsche Flugsicherung

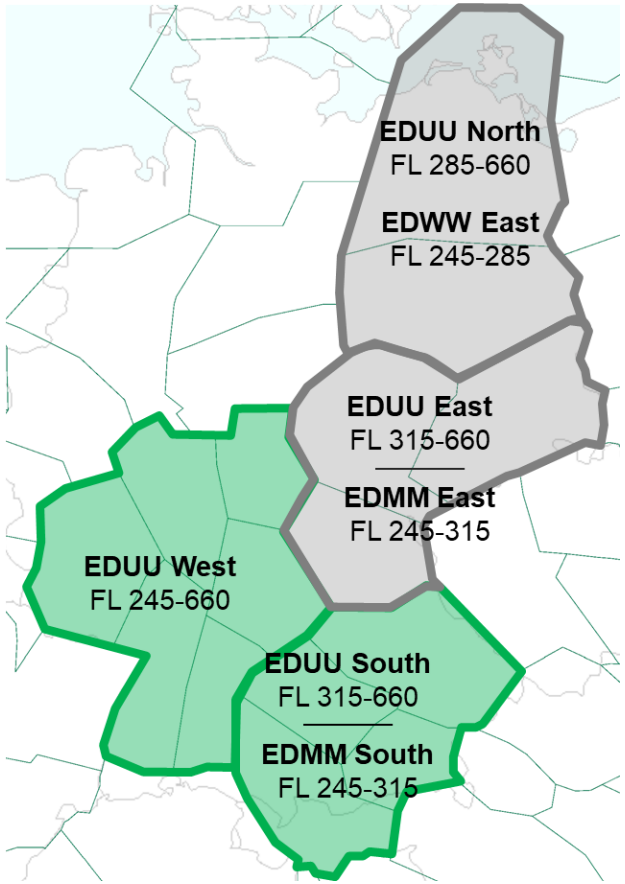
“Gradual Move towards FRA H24” – Winter 2020/21

FRA Cells EDUUFRA WEST (245+) / SOUTH (315+)

- **AIRACs OCT/NOV/DEC 2020:**
  - Flow-wise provision of RAD APP04 DCTs, mostly H24
  - (Partly amplified by Covid-19) some additional / shorter route options
- **AIRAC 2102 25FEB 2021:**
  - Transform RAD APP04 DCTs into FRA
  - Set EDUUFRAW + EDUUFRAS to “H24”
  - Some flows: E/X/I-availability / connectivity “night only”, thereafter flow-wise extension to H24 where practicable

Approach for FRA Cells EDWW (245-285), EDMM (245-315)

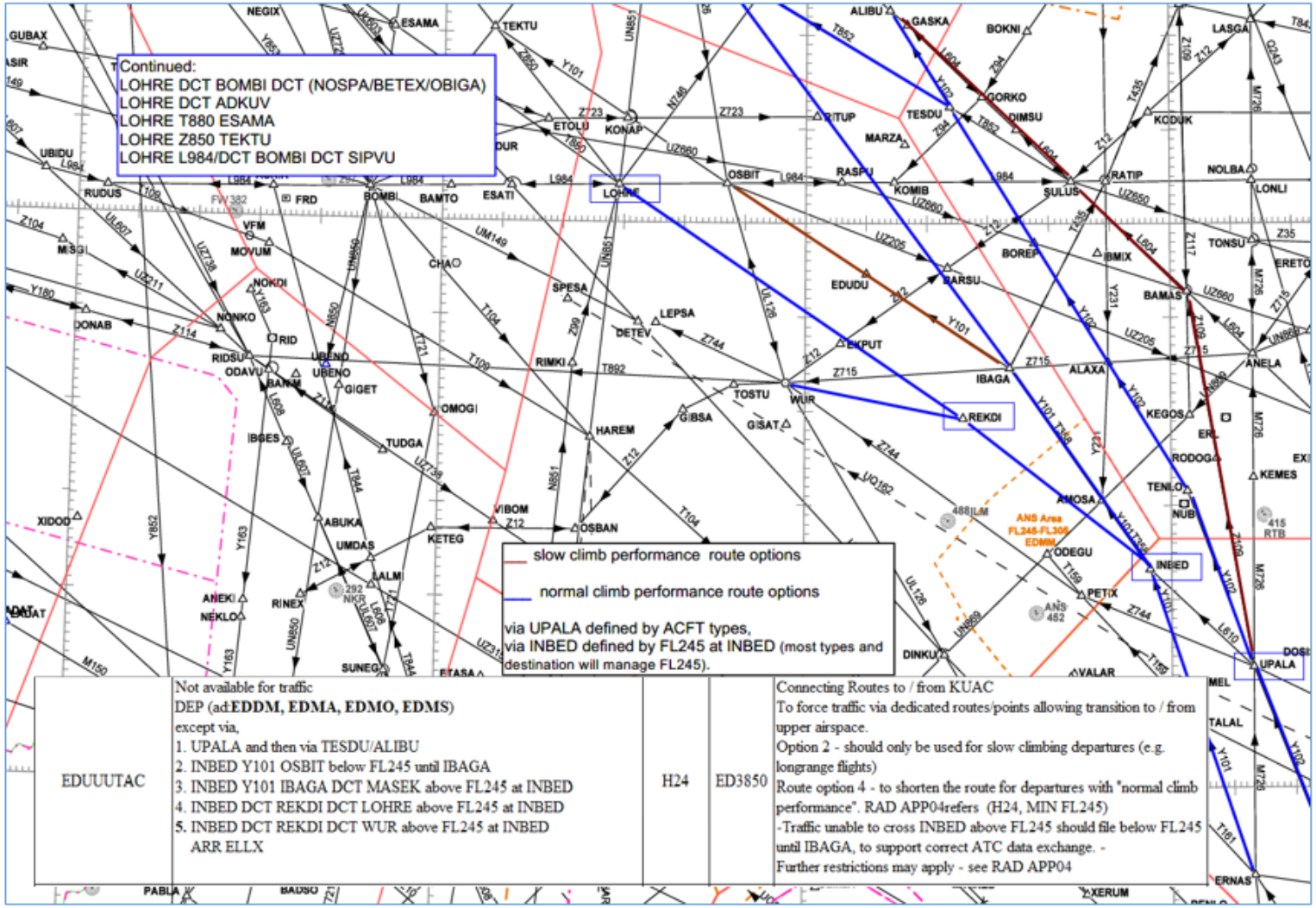
- Upgrade to FRA H24 depends on DFS’s new ATS System iCAS, 2022+



“Gradual Move towards FRA H24” – Planning AIRAC OCT-DEC 2020

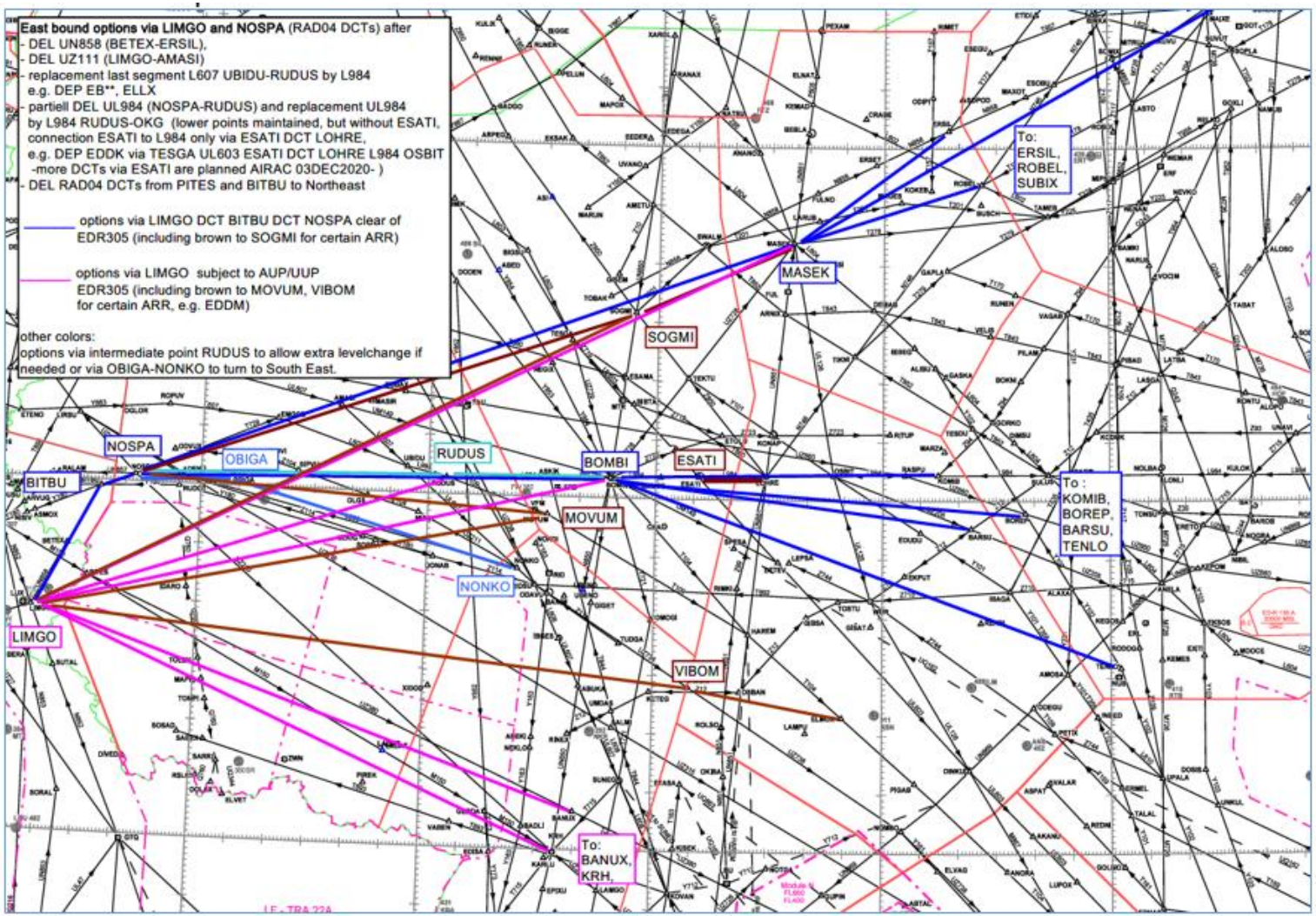
- **AIRAC 2011 08OCT2020**
  - Several West-East options
  - Several ATS route changes related to Connecting Routes
- **AIRAC 2012 05NOV2020**
  - Flow changes in EDUUFRA South “CHI flows”
  - ATS Route deletions
  - First examples of Free Route Flow restrictions
- **AIRAC 2013 03DEC2020**
  - ATS route changes / deletions SE-Axis
  - Major update of all flows on SE-Axis via DCTs (DCT segments as used with future H24 FRA)
  - Further growth of Free Route Flow restrictions

“Gradual Move towards FRA H24” - AIRAC 08OCT2020



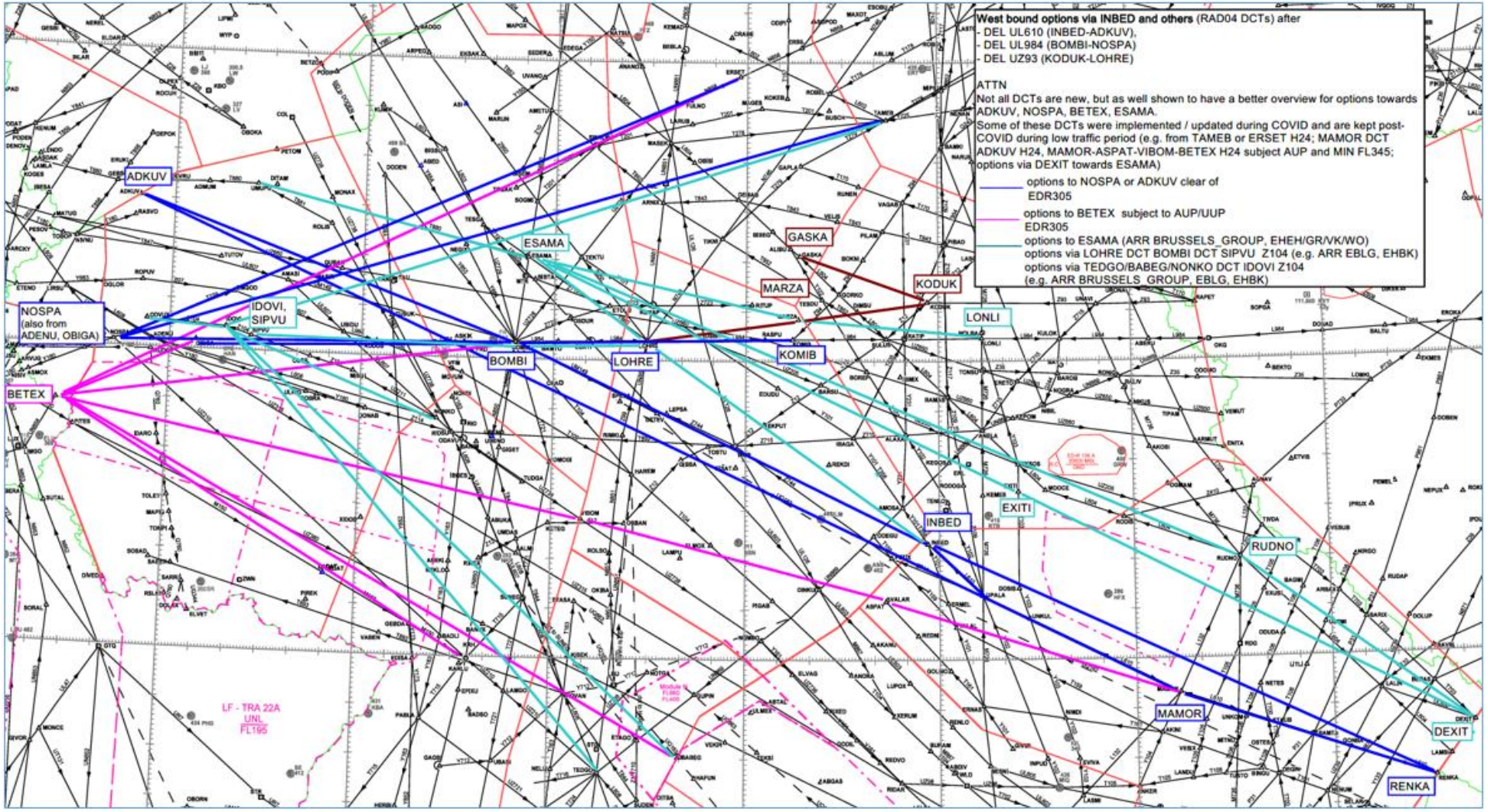
DFS Deutsche Flugsicherung

“Gradual Move towards FRA H24” - AIRAC 08OCT2020



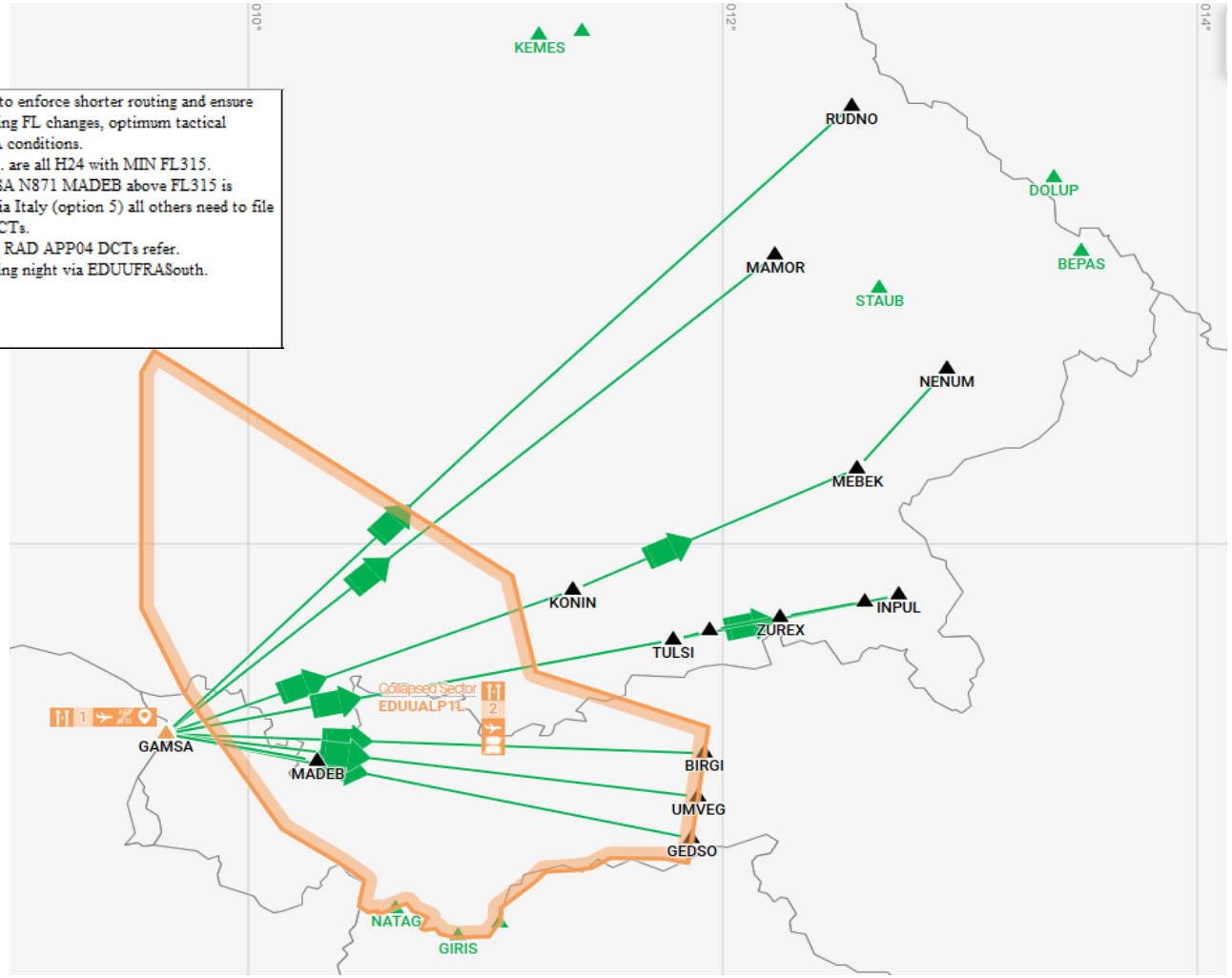
DFS Deutsche Flugsicherung

“Gradual Move towards FRA H24” - AIRAC 08OCT2020



“Gradual Move towards FRA H24” – AIRAC 05NOV2020

GAMSA	Not available for traffic above FL315 via as:LS and then via EDUUALP1L except via: 1. GAMSA DCT KONIN DCT MEBEK DCT NENUM 2. GAMSA DCT TULSI DCT INPUL 3. GAMSA DCT (BIRGI, GEDSO, MAMOR, RUDNO, UMVEG) 4. GAMSA DCT TULSI N871 BADVI L725 UNKEN ARR LOWL 5. GAMSA N871 MADEB and then via (NATAG, GIRIS, DIRAB) 6. GAMSA and then IBAGA, KEMES, STAUB 7. GAMSA and then EXITI, DOLUP, BEPAS	H24	EDLS1032	Free Route Flow restriction to enforce shorter routing and ensure certain DCT sequence allowing FL changes, optimum tactical handling and respecting LoA conditions. Listed RAD04 DCTs in 1.-4. are all H24 with MIN FL315. Note, that option via GAMSA N871 MADEB above FL315 is actually limited for traffic via Italy (option 5) all others need to file below FL315 or via listed DCTs. Option 6 is limited to night, RAD APP04 DCTs refer. Option7 - route options during night via EDUUFRASouth.



AIRAC2012

Flows via GAMSA, RUDAP and BRENO (EDUUFRASouth) updated

according future DCT sequence based on Free Route real time simulations between 2018-2020.

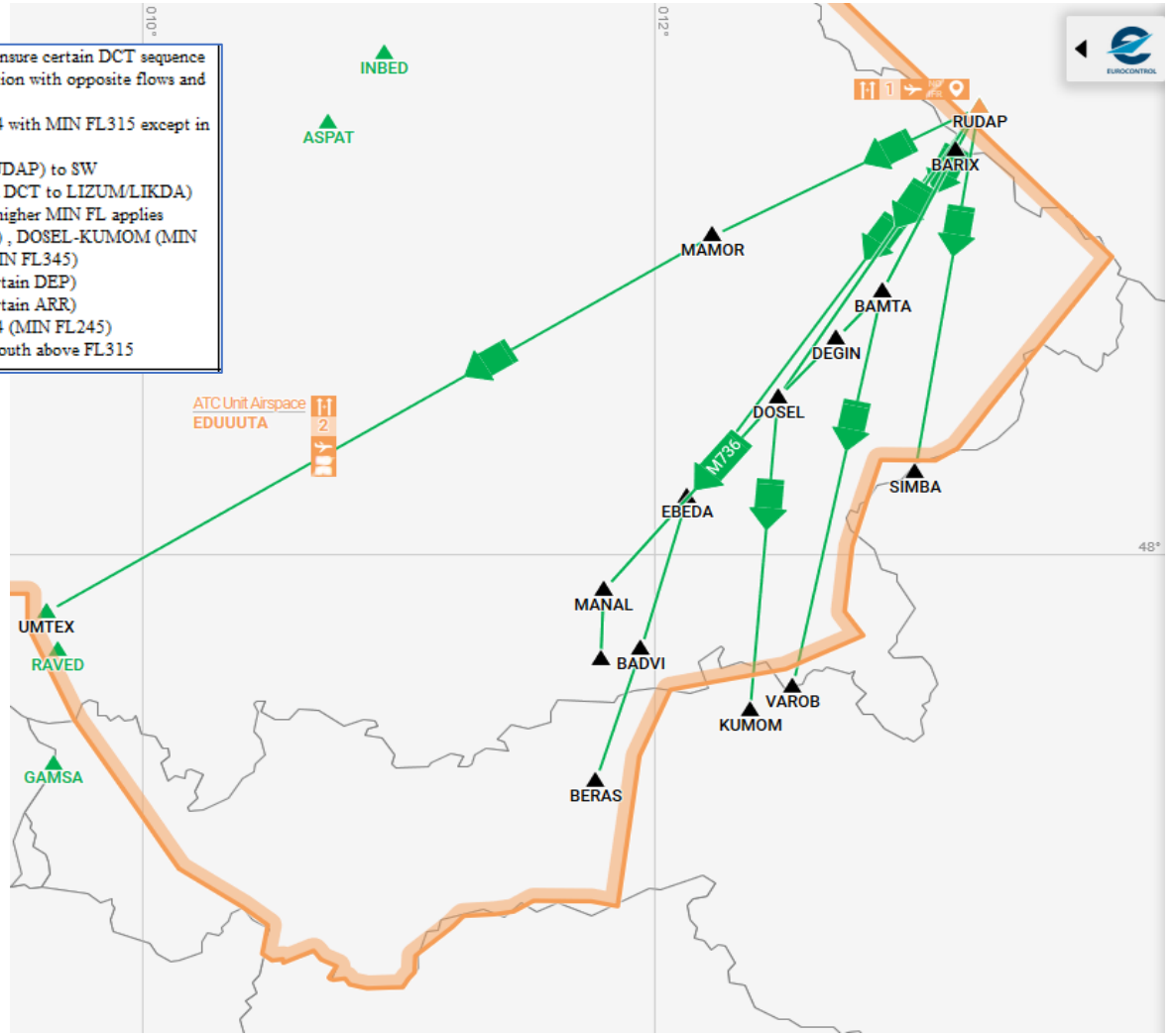
“Gradual Move towards FRA H24” - Free Route Flow Restrictions

- Certain flows need specific DCT sequence around corners, airspaces or to offer vector points (the specific NE flow via GAMSA is normally separated by vectoring from the SE axis main flow)
- The DCT sequence ensures options for FL changes odd/even or initial descent
- Listed DCTs within these restrictions form the required net of FRA DCTs as from AIRAC2102 (support CFSPs)
- Some of these restrictions are not valid during night - keeping present night FRA options via these points unchanged (below GAMSA restriction H24 – night options in 7. but creating mistake with BEPAS)
  - **To be discussed**: „and then“ versus “AAAAA-BBBBB” or “AAAAA DCT BBBBB” (potential CFSP and NM limitations)
- Major update/NEW implementation of these restrictions AIRAC2102 (complete set of E points, some I points and / or connecting routes extended)

GAMSA	Not available for traffic above FL315 via as:LS and then via EDUUALP1L except via: 1. GAMSA DCT KONIN DCT MEBEK DCT NENUM 2. GAMSA DCT TULSI DCT INPUL 3. GAMSA DCT (BIRGI, GEDSO, MAMOR, RUDNO, UMVEG) 4. GAMSA DCT TULSI N871 BADVI L725 UNKEN ARR LOWL 5. GAMSA N871 MADEB and then via (NATAG, GIRIS, DIRAB) 6. GAMSA and then IBAGA, KEMES, STAUB 7. GAMSA and then EXITI, DOLUP, BEPAS	H24	EDLS1032	Free Route Flow restriction to enforce shorter routing and ensure certain DCT sequence allowing FL changes, optimum tactical handling and respecting LoA conditions. Listed RAD04 DCTs in 1.-4. are all H24 with MIN FL315. Note, that option via GAMSA N871 MADEB above FL315 is actually limited for traffic via Italy (option 5) all others need to file below FL315 or via listed DCTs. Option 6 is limited to night, RAD APP04 DCTs refer. Option7 - route options during night via EDUUFRASouth.

“Gradual Move towards FRA H24”

RUDAP	Not available for traffic above FL315 via as:LK and then via as:EDUUDON1D except via: 1. RUDAP DCT EBEDA DCT BADVI DCT BERAS 2. RUDAP DCT BAMTA DCT VAROB 3. RUDAP DCT DOSEL DCT KUMOM 4. RUDAP DCT SIMBA 5. RUDAP P31 DOSEL DEP LK** 6. RUDAP DCT DOSEL M736 TULSI 7. RUDAP DCT MAMOR DCT UMTEX 8. RUDAP and then (ASPAT, GAMSA, INBED, RAVED, UMTEX)	1.-6. H24 7,8. 22:30..04:00 (21:30..03:00)	ED2246	Free Route Flow restriction to ensure certain DCT sequence allowing FL changes and separation with opposite flows and distance to LO boundary. Listed RAD04 DCTs are all H24 with MIN FL315 except in 2/3/4 and 7,8. 1. main option crossing NE (RUDAP) to SW (from BERAS via ATS or via DCT to LIZUM/LIKDA) 2.-4. other H24 RAD04 DCTs higher MIN FL applies BAMTA-VAROB (MIN FL345) , DOSEL-KUMOM (MIN FL335) and RUDAP-SIMBA MIN FL345) 5. ED2425 applies (onyl for certain DEP) 6. ED2108 applies (only for certain ARR) 7. night option see RAD APP04 (MIN FL245) 8. night options in EDUUFRASouth above FL315



To be discussed:

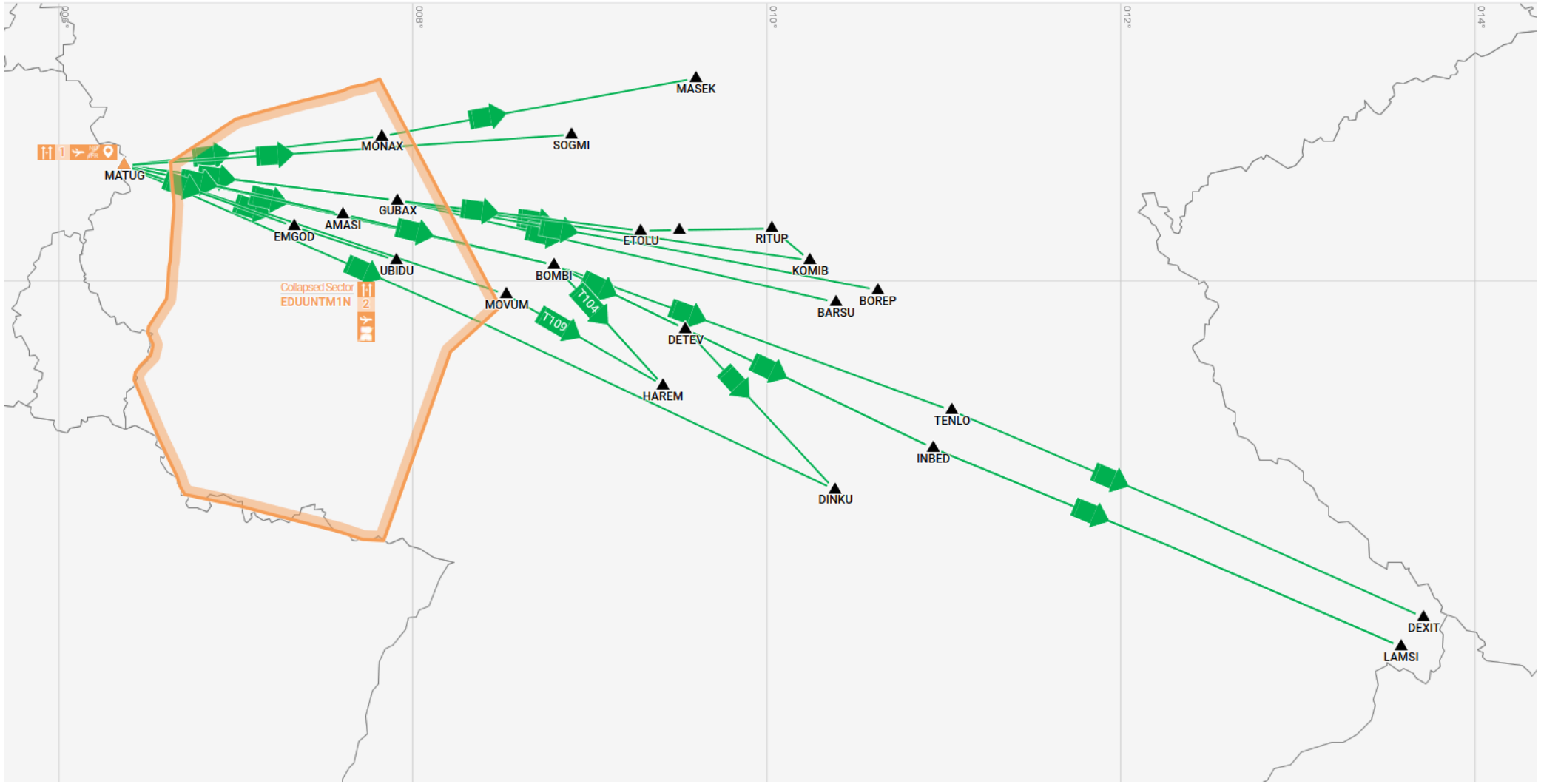
Time limitations of options to be added in utilization or in time column?

-example option 7 and 8-

(different timings are rather complecated for NM to program)

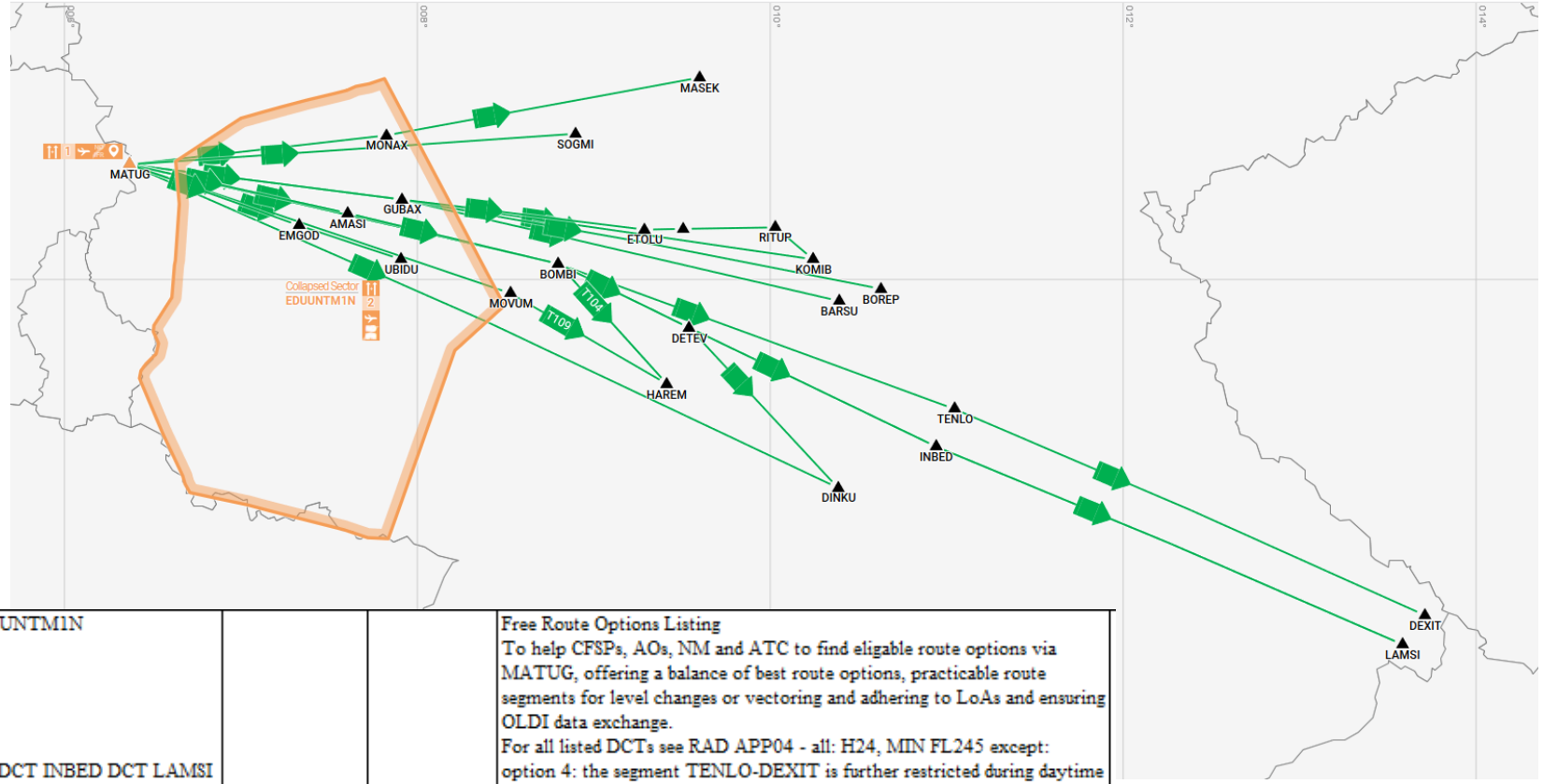
“Gradual Move towards FRA H24”

AIRAC2013



“Gradual Move towards FRA H24”

AIRAC2013

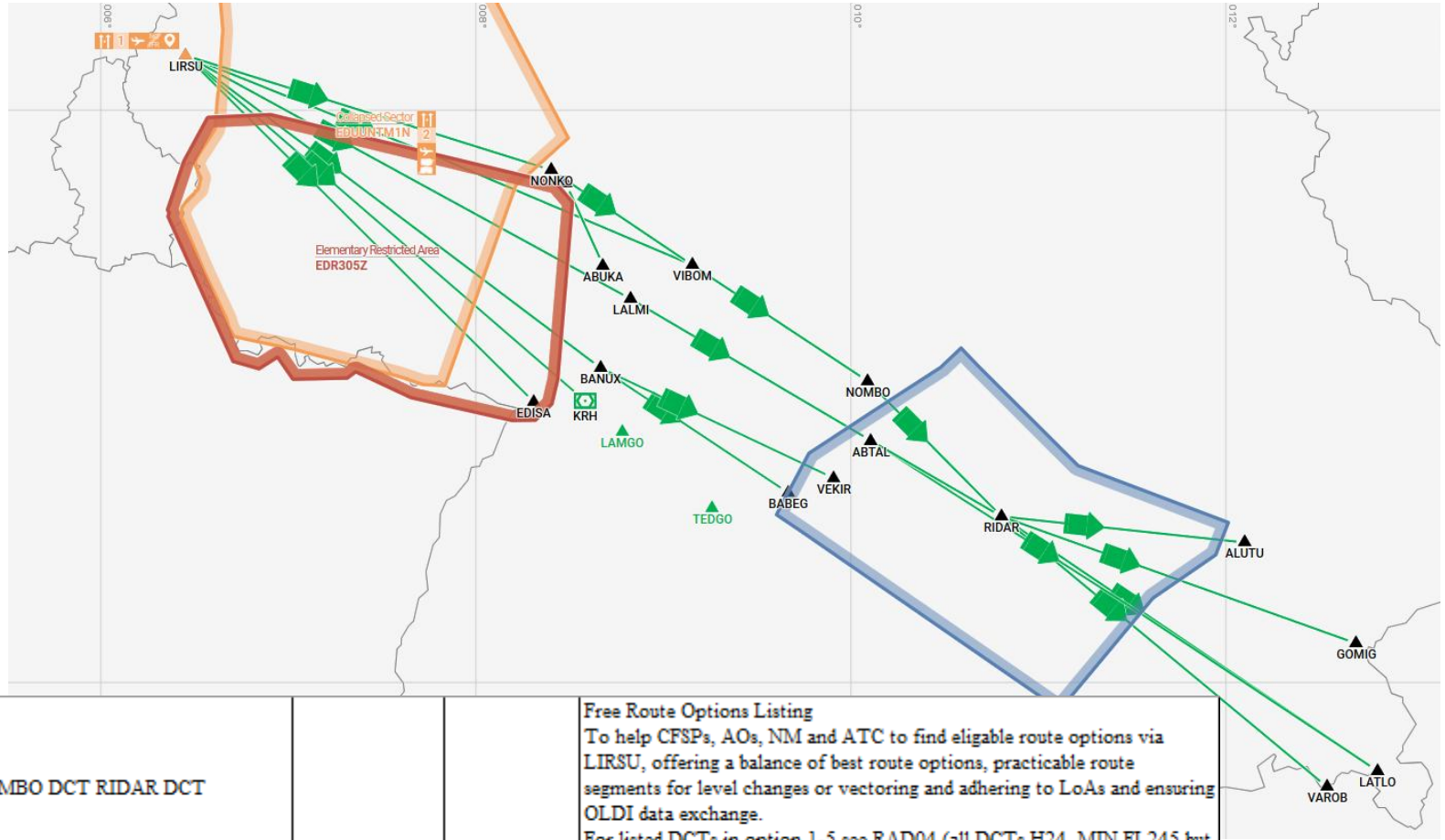


MATUG	Not available for traffic via MATUG above FL245 and then EDUUNTM1N except via 1. MATUG DCT MONAX DCT MASEK 2. MATUG DCT GUBAX DCT (pt:KOMIB/BARSU/BOREP) 3. MATUG DCT GUBAX DCT ETOLU Z723 KOMIB 4. MATUG DCT BOMBI DCT TENLO DCT DEXIT 5. MATUG/(MATUG DCT AMASI) DCT BOMBI DCT DETEV DCT INBED DCT LAMSI 6. MATUG DCT BOMBI DCT DETEV DCT DINKU 7. MATUG DCT DINKU 8. MATUG DCT MOVUM T109 HAREM ARR EDDM, LOWS 9. MATUG/(MATUG DCT AMASI) DCT BOMBI T104 HAREM 10. MATUG DCT EMGOD L607 UBIDU ARR EDDS/FQ/QG/SB/VK, ETHN 11.MATUG DCT SOGMI ARR (ad:EDDE, EDDV, EDVE, ETNW)	H24	ED2265	Free Route Options Listing To help CFSPs, AOs, NM and ATC to find eligable route options via MATUG, offering a balance of best route options, practicable route segments for level changes or vectoring and adhering to LoAs and ensuring OLDI data exchange. For all listed DCTs see RAD APP04 - all: H24, MIN FL245 except: option 4: the segment TENLO-DEXIT is further restricted during daytime to MIN FL325 (in utilization) option 5: INBED-LAMSI MIN FL345; option 7: DCT only available between 20:30..04:00 (20:15..03:00) MATUG is in principle not available for traffic via as:EDUUSLN1S except via MATUG DCT DINKU (night). Route Option 4 kept during post-COVID time period (otherwise route via BARSU DCT EXITI DCT DEXIT or via INBED DCT LAMSI)

“Gradual Move towards FRA H24”

AIRAC2013

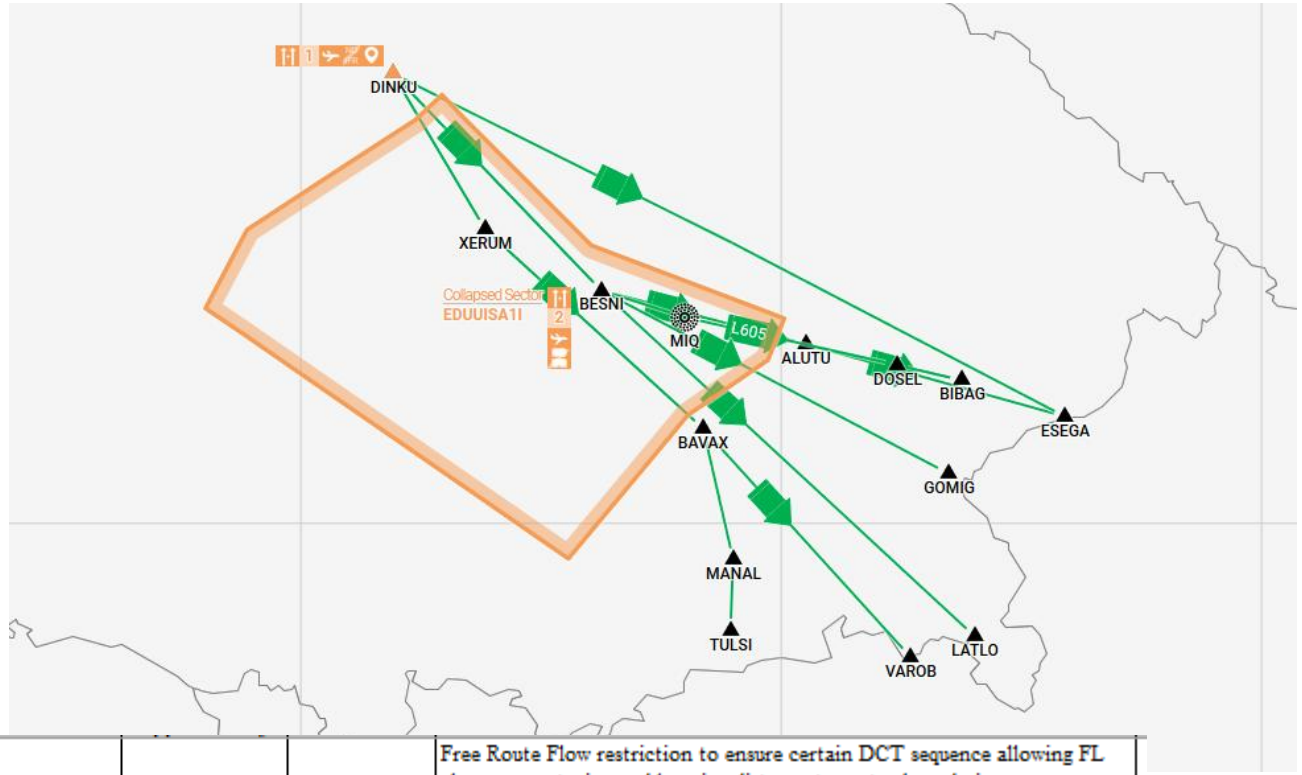
Added Airspaces in the view:
- EDR305Z
- Sector EDUUISA1I



LIRSU	Not available for traffic via LIRSU above FL245 and then EDUUNTM1N except via 1. LIRSU / (LIRSU DCT NONKO) DCT VIBOM DCT NOMBO DCT RIDAR DCT (pt:ALUTU, GOMIG, LATLO, VAROB) 2. LIRSU DCT LALMI DCT ABTAL and then a. ABTAL DCT LATLO b. ABTAL DCT RIDAR DCT (pt:ALUTU, GOMIG) 3. LIRSU DCT BANUX DCT (pt:BABEG, VEKIR) 4. LIRSU DCT (pt:KRH, EDISA) 5. LIRSU DCT NONKO L607 ABUKA and then (pt:KRH, LAMGO, TEDGO)	H24	ED2279	Free Route Options Listing To help CFSPs, AOs, NM and ATC to find eligable route options via LIRSU, offering a balance of best route options, practicable route segments for level changes or vectoring and adhering to LoAs and ensuring OLDI data exchange. For listed DCTs in option 1-5 see RAD04 (all DCTs H24, MIN FL245 but segments in option 1-3 beyound VIBOM, LALMI, BANUX with various higher FLs due to Munich ACC below; LIRSU DCT EDISA is timely limited) Most options (except via NONKO in 1. and 5.) are subject to frequent AUP/UUP for EDR305ZR.

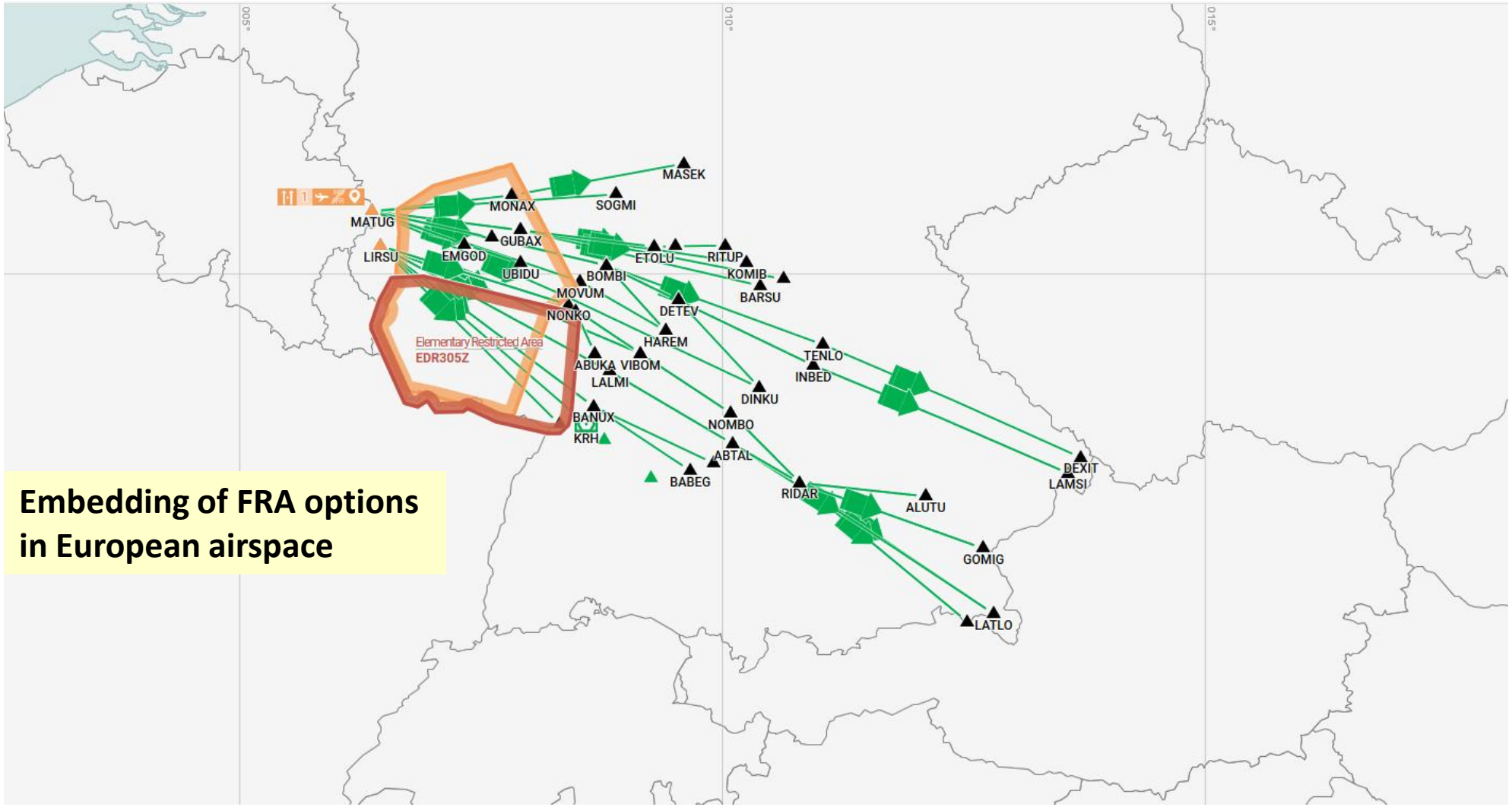
“Gradual Move towards FRA H24”

AIRAC2013



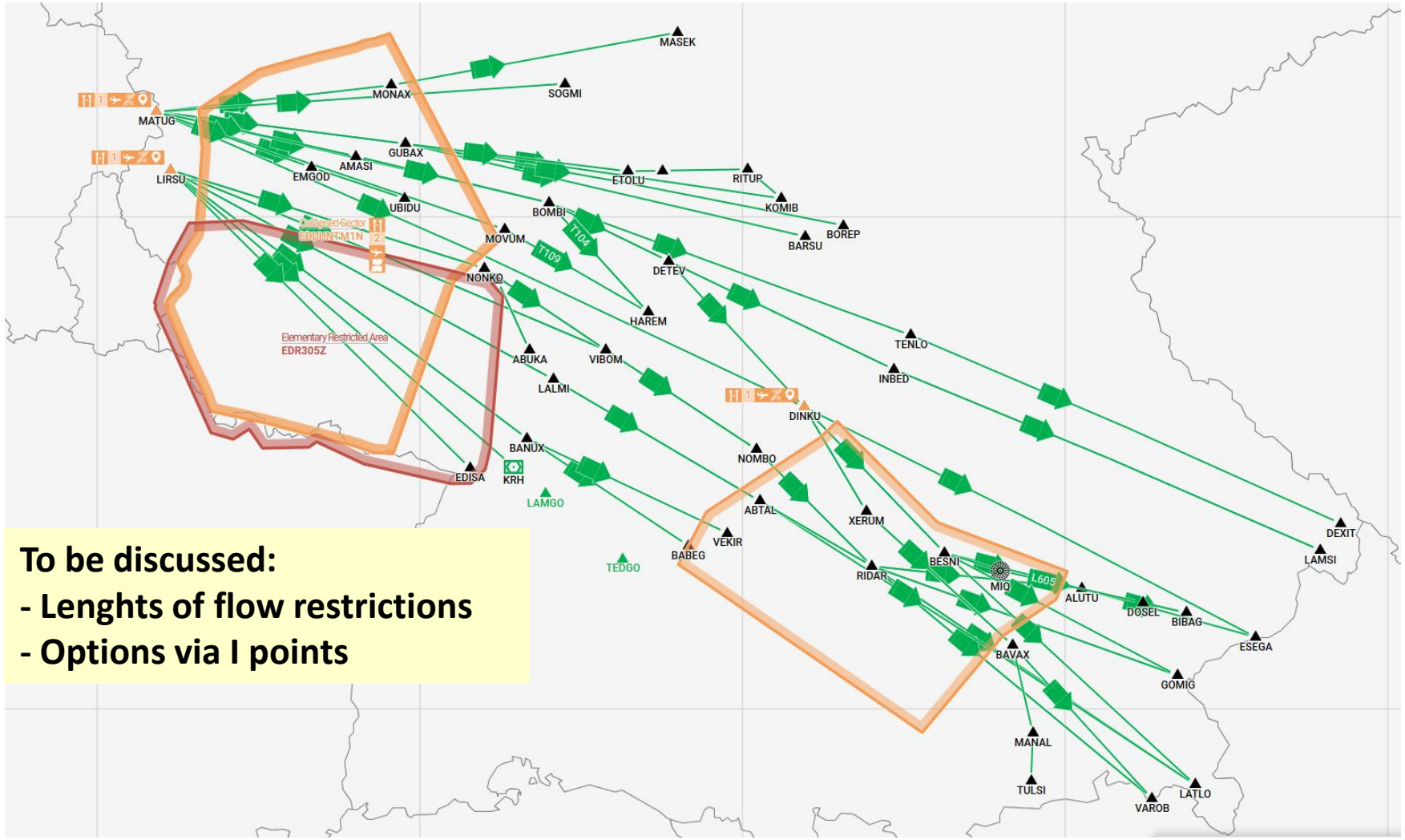
DINKU	Not available for traffic via DINKU above FL315 and then EDUUISA1I except via: 1. DINKU DCT BESNI and then a. BESNI DCT ALUTU DCT (BIBAG, ESEGA) b. BESNI L605 BIBAG ARR LOWL c. BESNI DCT (GOMIG, LATLO) 2. DINKU DCT ESEGA 3. DINKU M867 XERUM DCT BAVAX DCT VAROB 4. DINKU M867 XERUM DCT BAVAX Z106 MANAL M736 TULSI	H24	ED2272	Free Route Flow restriction to ensure certain DCT sequence allowing FL changes, vectoring and keeping distance to sector boundaries. For listed DCTs see RAD04 (option 1/3/4: all DCTs H24, MIN FL315; option 2: see RAD APP04 (H24 above FL315 post-COVID, below FL315 during night)

“Gradual Move towards FRA H24”



Embedding of FRA options in European airspace

“Gradual Move towards FRA H24”



To be discussed:
- Lenghts of flow restrictions
- Options via I points

“Gradual Move towards FRA H24” – AIRAC 25FEB2021 and later

- **AIRAC 2102 25FEB2021**
  - AMDT AIP publication DFS FRA H24 (EDUU FRA WEST + SOUTH)
  - Replace RAD APP04 DCTs with FRA options (with corresponding RAD Restrictions)
  - Initially, some FRA options remain „night only“
  - Communication:
    - NOV 2020: CFSPG
    - NOV 2020: Webinars to inform neighbouring ANSPs / ACCs, AOs, CFSPs
    - DEC 2020: AIC AIM
  - Data preparation
    - Provision of Excel file with FRA data, RAD APP04/PAN EUR as draft (**discuss**: demand + timeframe)
- **AIRACs until DEC2021**
  - Transformation DCTs into H24, where practicable

DFS Support in regard to AIRAC 25FEB2021

- **DFS hotline for external requests**:
  - 18 FEB 2021 – 05 MAR 2021
    MON-FRI 0900-1600L
  - Via email: **Free_Route_Airspace@dfs.de**
- **DFS will provide available supporting material on the DFS website:**
  https://www.dfs.de/dfs_homepage/de/Services/Customer Relations/Free Route Airspace (FRA)/

Acknowledgements

Co-financed by the European Union

Connecting Europe Facility

DFS Free Route Airspace project is supported by European Union
co-financing from the Innovation and Networks Executive Agency (INEA) through the Connecting Europe Facility (CEF) program.

Disclaimer