Understanding Dynamic Airspace

The Network Manager User Forum 2018

Chris Woodland

Thomas Cook Group ATC / Flight Planning Manager
Chair – NM Airline Operations Group

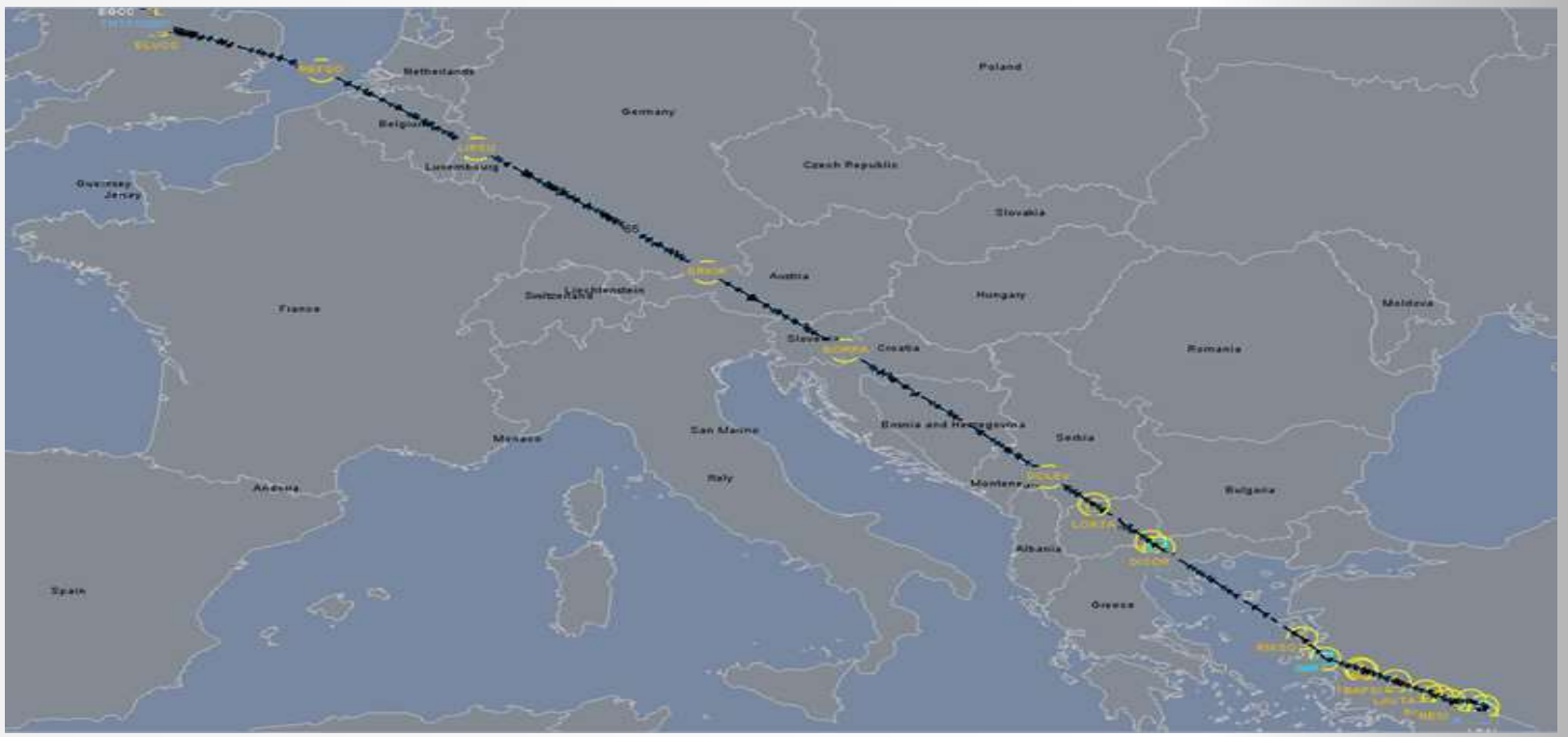
Overview

- Free Route Airspace (FRA)
  - Benefits / Complexity / Harmonisation
- Route Availability Document (RAD)
  - CFSP Optimisation / OCC
- NM System / Support
  - Services and Resources
- Scenarios
  - Confidence / Benefit / Workload

Free Route Airspace (FRA)

Free Route Airspace (FRA)

- Benefits are being realised.



- Route above was planned using ‘FRA DCTs’ between RIKSO- ELVOS
- Highlights extent of FRA in Europe

  Nb:Great Circle Distance GCD isn’t always the most optimal due wind / cost.
- Achieving a high level of optimisation through FRA zones has its challenges.

Free Route Airspace (FRA) – Issues / Complexity

- Which Airspace is ‘full’ free route?
  - Only 1 true FRA – Oceanic (without OTS) Portugal being close to full free route.

- Different implementation strategies
  - Constant testing and rewriting of CFSP system rules & behaviours
  - A more harmonised approach to implementation of states Free Route.
    - Cross Border
    - DCTs, ANSP system differences, entry / exiting FRA, flow measures and delegation of airspace.
  - OCC understanding of different approaches leads to non optimum routings.

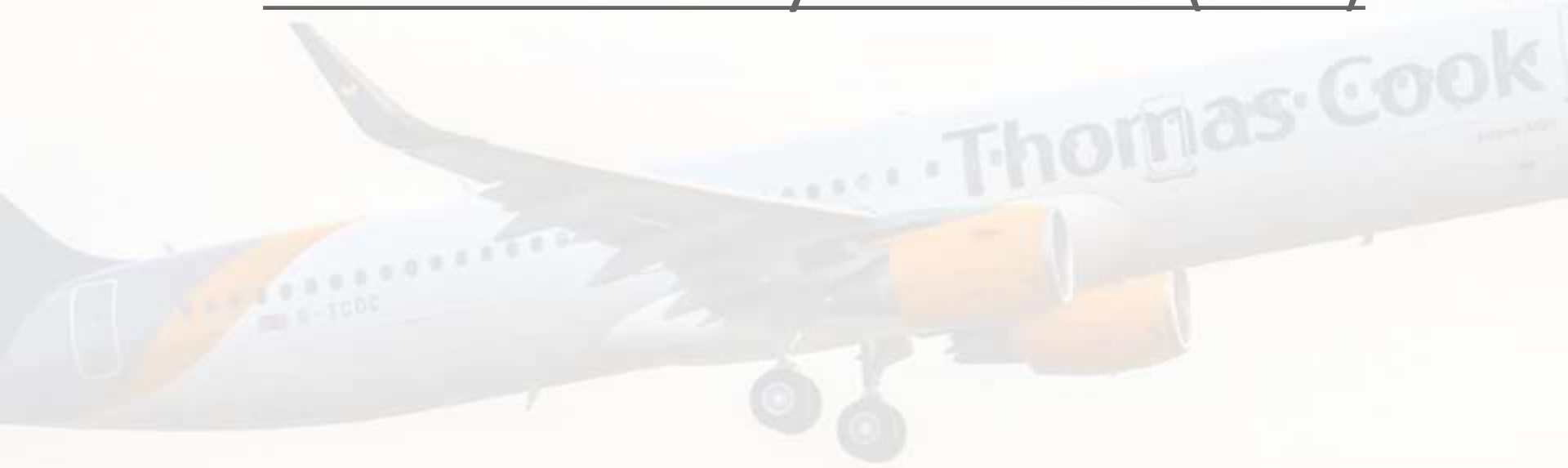
- Profile mismatches between CFSP and IFPS trajectories
  - Use of extended FPL information should continue to be encouraged to reduce REJ
  - Managing FBZ and FUA restrictions in RAD Appendix 7
    - Not all ANSPs and CFSPs are fully ready to exploit the full benefits.

  - Interpretation of flight planning rules such as RAD, Description of FRA.
    - AIP (data within FIR) / FRA (Built on sectors) compatibility
    - Multiple AIP entries for cross border or where sectors touch two FIRs

Free Route Airspace (FRA) – Issues / Complexity

- Testing period/regime not considered sufficient in some cases
  - Do airlines need to work closer with CFSP in testing phase of large airspace changes?
- Increasing volume of FRA segments results in computation slow down
  - Ability to reroute at short notice impacted and higher likelihood of more network delays.
  - Higher use of company routes to speed up computation times, reduces efficiency
- We all need to work together to make FRA work efficiently for every actor
  - If nobody uses FRA (or the routes are 'strange') might impose new restrictions.
- Airlines will suffer lack of optimisation and efficient routings.

Route Availability Document (RAD)



Route Availability Document (RAD)

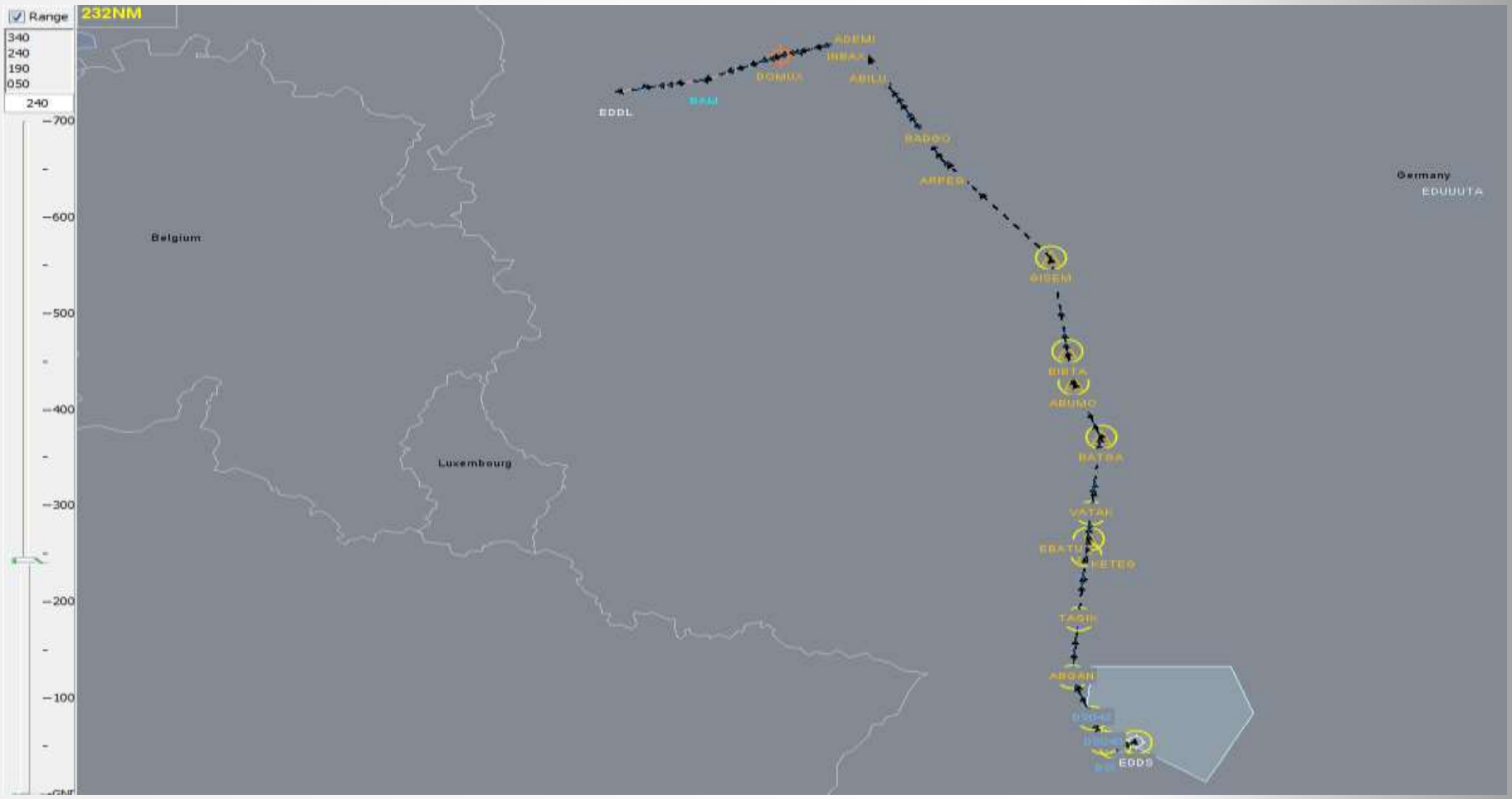
- Is it too complicated?

LSAGUAC	Not available for traffic Via MOBLO and then LSAZCTA/UTA Except 1. Overflights (except ARR LSZH/XI/ZB/ZC/ZG, LSM*, LFGA/GB/SB/SM, EDNY/TD/TM) Via a. MOBLO UZ662 LAMUR UZ67 KORED when UZ662 is available FL295 and above b. MOBLO UN853 MOLUS UN871 KORED when UZ662 is not available FL295 or above c. via GODRA d. via MOBLO DCT SONOM 2. ARR EDNY/TD/TM Via a. MOBLO UZ662 LAMUR UZ67 KORED when UZ662 is available at all levels b. MOBLO UN853 MOLUS UN871 KORED when UZ662 is not available at all levels 3. ARR LSZH/MD Via a. MOBLO UZ662 LAMUR UZ67 KORED UN871 BERSU when UZ662 is available at all levels and Z57 not available at all levels b. MOBLO UZ662 LAMUR Z57 DOPIL when UZ662 is available at all levels and Z57 available at all levels c. MOBLO UN853 MOLUS UN871 BERSU when UZ662 is not available at all levels 4.ARR LFGA/GB/SB/SM via a. MOBLO UZ662 LAMUR Z/UZ67 KORED when UZ662 is available at all levels b. MOBLO UN853 MOLUS UN871 TELNO N/UN871 KORED when UZ662 is not available at all levels	H24	LS2596

- These type of RAD restrictions are the cause of **92%** of all REJ messages received by Thomas Cook Group Airlines
  - LF3230A/LF3231A/LF3232A/LF3233A
  - LS2512/LS2513/LS2514/LS2610/LS2410/LS2596
  - Dependent applicability causes many flight planning issues

Route Availability Document (RAD)

Use of Sector Data: Example EDUUUTA



Route Availability Document (RAD)

Use of EDUUUTA Sector

Route Availability Document (RAD) - Questions

- Are RAD measures being used to flow traffic to protect from delays?
- How are RAD measures being audited for efficiency and effectiveness?
- Are they too static?
  - Can they be more dynamic based on time/ day/month and purpose?
  - If so, how can these be made available in a clear and concise manner?
- Is the RAD the right ATFCM tool?
  - Some RAD measure appear to capture limited amounts of traffic.
  - Are many RAD measures no longer human readable.
- Increment files are updated far too often, by a handful of ANSPs.
  - How can this be further reduced recognising some steps have already been taken?
- Are NM B2B services being utilised effectively?
  - Perception is one of limited use by AOs / CFSPs

Route Availability Document (RAD)

- RAD vs Profile Tuning Restriction (PTR) mismatch

TRA	SUXAN	345	660	Yes	Not available for traffic 1. ARR LIM*, LIP* (except LIPR/PY) 2. DEP LS**, EDNY, EDT*, LFGA/GB/SB/SM	H24	LSLI5004

ID: LSAZ12D
Operational goal: FRC LSAZM3
Textual description: UN850
Flow routing: GND-330, NATOR UN850 TRA
Flow conditions:
Departing one of [EDDF|EDFE|EDFZ|ETOU] AND THEN crossing NATOR UN850 TRA
Applicability = H24

- The above PTR restricts routing NATOR UN850 TRA this makes TRA-SUXAN unusable departing EDDF

- I'm unable to make FL345 at TRA to use this DCT without getting a IFPS REJ

NM Systems / Support

NM Systems & Support

- NM Systems
  - Current tools (especially the NOP) is not user friendly and navigation difficult
  - Perhaps a lack of awareness of the NM services provided on AO side
  - Automation
    - AOs concerned that helpdesk automation will reduce standard of service when needed most during busy periods
      - Clear communication of automation
      - Post operational transparency of eHelpdesk auto responses

- NM Tactical Support
  - Understand resources are lean, all stakeholders are in the same position.
  - Does the level of support meet the needs of the AOs and their OCCs?
  - Is increased level of AO representation needed in the NM Operations Centre?

NM Systems & Support – Tactical Tools

- Aircraft Operator What If Reroute (AOWIR)
  - Unreliable and false overloads
    - Able file route manually if shown as ‘overload’ with no delay or regulation
    - Undermines confidence in the system
    - Should calculate any trajectory regardless of overload
    - One step process required
- IFPS Validation System (IFPUV)
  - Include any likely Slot Allocation Message (SAM)
  - Include any relevant Scenario information
  - Last Validity of the EOBT if on / subject to Conditional Route
- Possible Route (POSRTE) following REJ message
  - As RFL being the major factor in POSRTE generation, an ever increasing number of non optimum trajectories are delivered to OCCs
- Airline Operations Group (AOG) action to create small working group to drive requirements in 2019+ ahead of industrialisation of SESAR concepts

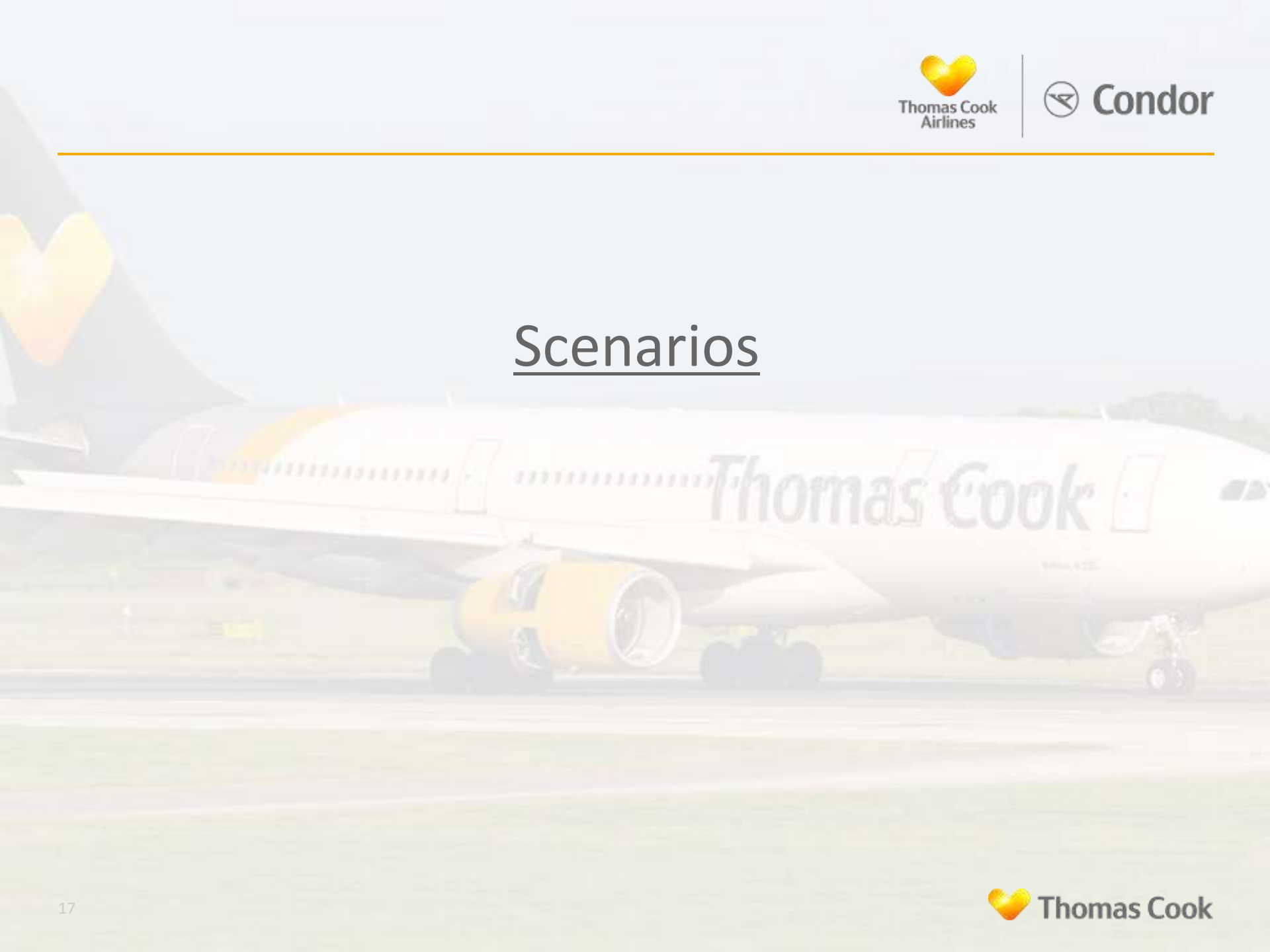
NM Systems & Support – POSRTE example

(FPL-TCX61XS-IS -B753/M-SDFGHILORVWXY/L
-LCLK1850
-N0454F320 PHA UM31 GENOS DCT PEDER/N0452F340 DCT EVENO UM601 EXELA
UN127 RIKSO/N0449F340 UN127 LMO/N0448F360 DCT EVIVI L863
EDIKA/N0444F340 L863 OKANA DCT NEPOS DCT BABIT DCT GOTAR DCT NURMI DCT ESEGA/N0450F360 DCT ABTAL DCT LIMGO DCT **TOLVU/N0446F340** UN857
RAPOR DCT RODIN DCT KESAX UT421 KUNAV TIMBA4B
-EGKK0417 EGSS
-PBN/A1B1D1O1S1S2 NAV/RNP10 RNP5 RNAVGPS DOF/170927 REG/GJMAB
EET/LGGG0032 LTBB0037 LGGG0105 LBSR0134 LYBA0147 LHCC0219 LOVV0236
EDUU0256 EBUR0337 LFFF0343 EGTT0410 SEL/GQBD OPR/TCX PER/D RVR/075 RMK/TCAS OVERFLT PERM NBR LT PASSENGER FLT)
ERROR PROF204: RS: TRAFFIC VIA LFEEUXR IS ON FORBIDDEN ROUTE REF:?**LF3232A**? LFEEUXR NOT AVAILABLE FOR TRAFFIC

POSRTE N0454F320 PHA UM31 GENOS DCT PEDER/N0452F340 DCT EVENO UM601 EXELA UN127 RIKSO/N0449F340 UN127 LMO/N0448F360 UN128 FSK UL608 DISOR/N0444F340 DCT LONTA UL608 DOLEV DCT PEVAL DCT RESIA/N0450F360 UP131 ARGAX UL613 ROTSI/N0446F340 UL613 DIDOR UT10 IRBAL UT421 KUNAV

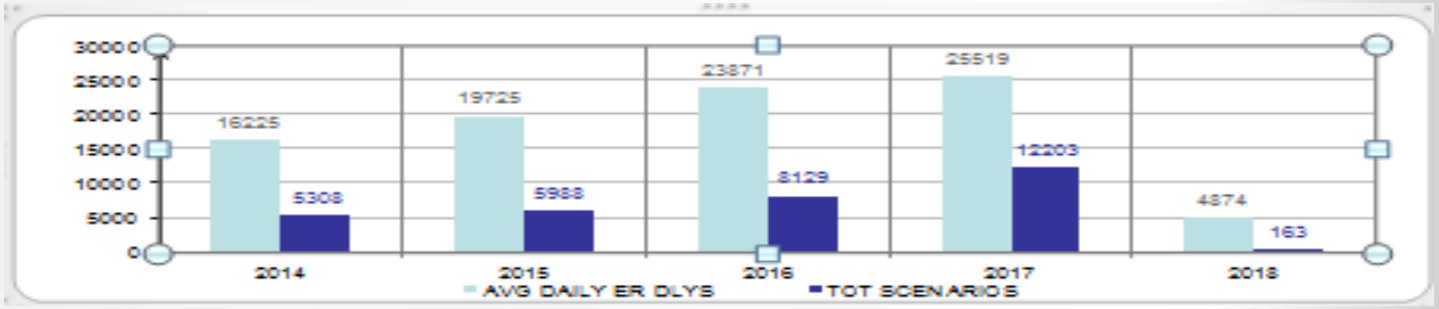
COST DIFFERENCE $453 and POSTRE generates ‘Yo-Yo’ FPL

Scenarios



Scenarios

- Significant increase in scenarios 2016 vs 2017



Light blue – Average enroute delay per day / Dark Blue – Total number of scenarios in calendar year

- Currently manual workload for OCCs
  - –Assume circa10mins per reroute calculation, analysis and distribution.
    - Even if only 2 flights caught in each scenario, over 4067hrs OCC effort in 2017 to manually rectify
  - –Resources are finite, more automation needed
- Concern from AO community that benefits are not clearly captured
- AOG action to investigate how many flight operate as per scenario
  - –Results in unanticipated traffic
  - –Significant excess workload and fuel uplift
  - –Establish if scenarios are the right ATCFM technique in all circumstances?
    - RAD / Mandatory Cherry Picking / Miles in trail all could be alternatives

Summary

- Is complexity now over-riding the operational benefits?
- AOs must be able to take advantage of the new procedures and processes
  - Unconvinced that this is currently the case
- Is it time to step back, reflect and ensure maximum benefit is being realised
  - Back to basics, address fundamental structural issues before bolting on ever more complex and unaligned methods of operation
- Future implementations require stable and harmonious procedures at Network level to ensure effective industrialisation and deployment
  - SESAR / FF-ICE etc

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Thankyou for your attention

Any Questions?

Thomas Cook