Modernising Airspace

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Modernising Airspace

• Basic structure of UK airspace developed over 40 years ago
• Since then, passenger demand has increased a hundred fold
• Radically improved Aircraft performance & navigation capability
• SES goals to simplify & harmonise ATM improving safety, flight efficiency and reduce cost
• Environmental considerations
• Strategy for all users of the airspace
FAS sets out the UK’s ambition to modernise the airspace system in line with SES II and SESAR goals.

- Developed & Consulted by CAA, NATS, MoD and DfT
- Public & Industry Consultation

2010-2011

FAS Industry Implementation Group formed 2011/12

“First concrete step toward SESAR deployment in Europe” Patrick Ky SESAR JU.

Dec 2012
In 2013 FAS entered Deployment Phase

FAS Governance Arrangements and Working Groups

**FAS Deployment Steering Group (FAS-DSG)**

- CAA / NATS
- Airlines
- Airports
- ANSPs
- IAA
- MoD
- GA
- DfT
- TSC

*(Co-Chair - M Rolfe & M Swan) (Director Level Representatives)*

**Network Optimisation Working Group**

- NATS / CAA
- Airlines
- Airports
- MoD
- TSC
- ACL

**Airspace Redesign and PBN Working Group**

- NATS
- CAA
- Airlines
- Airports
- GA

**Scottish TMA**

**Manchester TMA**

**CAA FAS Policy and Regulatory Programme Board**

- CAA
- NATS
- IAA
- MoD
- DfT

**FAS Industry Implementation Group (FASIIG)**

*(Co-Chair – British Airways and NATS)*

**FAS VFR Implementation Group (FASVIG)**

*(Chair – Light Aircraft Association)*

**Delivery Assurance, Deployment Issues, Communications**

**Industry Collaboration and Alignment of Investment Plans**

**FAS Safety Project**

**Policy and Regulatory Requirements and Issues**
FAS Deployment Plan

1. Airport CDM
   - Implementing the systems and processes to integrate the aircraft turnaround phase into the ATM system and sequence departures to maximise runway efficiency.

2. UK Wide PBN Implementation
   - Deploying PBN Arrival & Departure routes across UK airports.
   - Enhancing PBN Route Spacing Standards.
   - RNAV1 Mandate in LTMA to support LAMP.

3. PBN Departure Enhancements
   - Maximising the benefits of RNAV1 Departures.

4. Harmonised Transition Altitude
   - A 3.5 year lead time to implement a higher TA for UK working to harmonisation at 18,000ft across controlled and uncontrolled airspace.

5. Terminal Airspace Redesign
   - Significant commercial benefits and increased access for GA.
   - Final TMA design based on RNP.
   - A-CDM data enables Queue & Network Mgmt.

6. Enhanced VFR Operations and Low Density, Low Complexity Airspace
   - LAMP P2 & NTCA dependent on a higher TA.

7. Enhanced FUA
   - To maximise use of temporary airspace for Civil, Military and General Aviation operators.

8. Arrival Management
   - Streaming traffic inbound into the LTMA across the UK & Ireland FAB to reduce stacking & delays.

9. Queue Management
   - Arrival Management across FABs, combined with Departure Management to de-conflict outbound traffic flows and A-CDM to integrate the turnaround process.

10. Network Management
    - Supporting development of the European Network Manager's capability to smooth traffic flows, remove pinch points and enable efficient flight profiles across the system.

11. Network Wide
    - En-route / Network Wide
Airspace Re-Design & Performance Based Navigation
Today's Departure Routes
Heathrow Westerly Example

• Many departures share common initial route legs

• Very few (if any) aircraft fly the published route after they reach 4000ft

• SIDs are “single lane roads”

• Need to split routes by 30-45 degrees to allow 1 minute departure intervals
Performance-based Navigation
FAS Trials gathering data to support new design standards
Performance-based Navigation
Data analysis
Route Spacing & SID Divergence Guidance

- PBN allows closer spaced, more precise routes
- Reduced separation between departures can increase runway throughput, flight efficiency and noise abatement opportunities
- ‘Enhanced’ Route Spacing & SID Divergence Standards due in March 2015 developed by CAA using data from the FAS trials
- FAS Airspace & PBN Working Group industry focal point to support development of guidance & will review draft material
- Based on DEP work, Gatwick ADNID SID with 21 degree divergence & 1 minute departure split introduced 16 June 2014
RNAV1 Mandate in London TMA

• RNAV 1 as the minimum performance standard for aircraft navigational capability in the London Terminal Area (LTMA) from **November 2017**

• That the route network be redesigned to a minimum RNAV 1 standard before **November 2019** by NATS (above c. 4000ft.) and the Airports (below c. 4000ft)
Evolving PBN Capability

- LTMA Mandate is based on RNAV1
- Airports can use higher standards for specific applications
- E.g. RF Legs & RNP “AR”

PBN (RNP1 RF) Departure Trial at Stansted
Noise Respite Trial

On average, around 16-17 flights arrive at Heathrow each morning between 4.30am and 6.00am.

The trial explored whether routing these flights in a more defined way – particularly at the beginning of their approach into Heathrow – could offer more predictability for the people living below.

Find out more at nats.aero/blog
London Airspace Redesign
London Airspace Management Programme redesign of LTMA based on RNAV1

• LAMP Phase 1 Winter 15
• Gatwick & City + changes to Stansted routes
• Aligned with Southend ACP
• £7-14m fuel savings
• Increased capacity & more systemised airspace
• 2017 Transition Altitude to 18k
• Phase 2 2017-19 Heathrow, Stansted & Luton Arrivals & Deps

2020 LAMP Design
Scottish TMA DDG
- Increase runway throughput with reduced SID separations
- 3nm Separation in TMA
- PBN Arrival and departure routes
- Evaluate High Performance SIDs
- VOR Rationalisation timetable
- Evaluate 3nm PBN separation
- Strengthen interfaces between adjacent airports and en-route

Northern Terminal Control Area
- Detailed PBN design & Sims Jul/Oct
- Design workshops completed with Leeds, Liverpool and Manchester
- In process of setting up an NTCA DDG – supported by airports
UK & Ireland Transition Altitude

• CAA and IAA announced the intent to harmonise the Transition Altitude at 18,000ft across UK and Ireland FAB

• Critical to the deployment of departure procedures that climb continuously to the cruise as part of LAMP Phase 2

• Effectively “lifts the lid” on the TMA

• Decision has been taken to implement (Dec 13)

• CAA consultation on CONOPs November 15 – February 2016

• Target implementation date Nov 2017
Approach with Vertical Guidance

• Replacement of non precision approach with GPS approach procedures (LNAV/Baro VNAV/LPV)
• Benefit resilience/minima & safety
• Opportunity being pursued for GSA part funding (c.50%) of roll-out to UK airfields
• Over 30 airfields have expressed interest
• Call response due Sept 2014
Network Integration
Integrating Airports into the Network

- Departure Planning Information project initiated in 2013
- Funded by Transport Systems Catapult
- Aim to provide accurate departure planning information to European Network Manager via:
  - Enabling DPI interface from 8 NATS EFPS towers
  - Implementing DPI interface at non EFPS towers
- DPI trial now under way with London City
- Tender process for Non-EFPS Airports under way via TSC is slightly delayed expected Oct 14 – supported by AOA members
- Programme aim to provide accurate DPI data for 80% of UK traffic
DPI Timeline / Progress to-date

Set-up Governance & Resources, Requirement capture, Benefit Management Plan

EFPS Towers: Requirements capture
EFPS Towers: solution & roll-out review
EFPS Towers: Core software Build
EFPS Towers: Site roll-out

Programme Management (inc. Business Case)

Non-EFPS Towers: Requirements Capture
Non-EFPS Towers: Tender Process & roll-out plan
Non-EFPS Towers: Core solution development
Non-EFPS Towers: Core Site roll-out

Complete Delivery

Jul-14

2014/15
Arrival Management

• Reduce orbital holding and sequence aircraft over wider distance
• Speed reduction in en-route & descent when holding predicted to be > 9 minutes
• Target up to 4 minutes reduction in holding at peaks
• Aircraft burn c.90% less fuel than in orbital holds = $15-20m savings per annum
• Supported by Reims, Maastricht, Shannon & Prestwick & will be expanded to DFS & Brest
• BAW74 on 21/3/14 first aircraft to use 350nm XMAN validated by Reims
• First step towards SESAR arrival management vision
Heathrow typically 160-180k minutes of delay per annum due to headwinds.
TIME BASED SEPARATION SYSTEM
Time Based Separation

- World First TBS implementation at Heathrow in March 2015
- Provides approach controllers with dynamic separation indicators:
  - Based on real time winds
  - New time based separation rules
- Expected to save 80,000+ minutes of delay annually
- Next step will be mixed mode runway e.g. Gatwick

Wake vortices dissipate quicker so separation distance can be reduced safely.
FAS Deployment Plan highly aligned with PCP & Airports Commission

SESAR PCP

AF1 - Extended AMAN & PBN in high density TMAs
AF2 - Airport Integration & Throughput Functionalities
AF3 - Flexible Airspace Management & Free Route
AF4 - Network Collaborative Management

Discussing how FAS will integrate with Deployment Manager
FAS 2014/15

- Significant progress made in 2013/14
- Only discussed a small part of FAS Deployment Plan today
- Strong & growing support from across the industry
- New groups
- FAS driving changes to regulatory guidance which will enable new designs & procedures
- Opportunities for external funding
- Focus on external communications this year
Thank you for listening