Next Generation Airspace Developments:

Europe’s Contribution to Global Interoperability

ICNS 2013, Day 1 Plenary
Agenda

- ANConf/12: What is Europe’s response
- Some Critical issues
  - Incentives
  - 4D Trajectory Management
  - Architecture Aspects and Airborne Integration
  - Integration of RPAS in ATM
  - Airport capacity (wake vortex harmonisation)
European ATM Developments: a Permanent Quest for Interoperability

- First common AIP in the 1930’s
- Small countries at jet speed led to creation of EUROCONTROL
- Single Sky for single market
- Pressure on cost-efficiency
- New increasingly integrated solutions & technologies
- Europe historically deeply engaged in ICAO work
Global Perspective Magnifies Issues Encountered at European Scale, Calls for Similar Arrangements

Global traffic development spreads the same issues globally
-> We need global standards/interoperability, timely
-> Too many intermediate steps/standards make evolution more difficult

Deployment where and when needed, but based on common principles/rules/data & interoperable technologies
-> One size does not fit all

Cooperation early in life cycle is more efficient
-> Among programmes, within/across regions, with ICAO
-> On requirements, R&D activities
ICAO GANP / European ATM Master Plan: Concurrent, Complementary, not Competitive

- Same philosophy
  - Need to improve ATM performance
  - Through harmonisation of systems, procedures
    - And regulations
  - Through deployment of a series of step changes
  - Aim at the Global ATM Operational Concept

- Mutual impact, Global ↔ European
  - From concept definition to operations
  - For timely and useful standards
European ATM Master Plan

- Aims at successful, timely & efficient deployment
  - Includes additional essential considerations
    - Features not requiring global interoperability
    - Institutional, managerial, regulatory aspects, e.g.
      - Change management process
      - Effective commitment of all actors
      - Financial instruments
    - SES
      - Common regulatory framework incl. performance
      - FABs
- Bridges R&D and deployment in a consistent plan
  - A cohesive programme across industry through SESAR JU
  - An objective: wide cooperation
European ATM Master Plan Mapping with ICAO ASBUs: Steps and Blocks

Same notions of
- Progressive deployment
- Performance orientation
- Synchronised actions

Presentation tailored to audience
European Efforts Map to the Global Ones: Operational Improvement Steps and Modules

Mapping of contents and enablers, in particular standardisation needs

Precise mapping for Block 0
Mapping to Essential and other OIs

Precise mapping for Block 1
European ATM Master Plan Technology Roadmaps consistent with those of the GANP

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EUROCONTROL SJU Contribution Vs ASBUs


APT
- B1-10 - Improved Operations through Free Routing
- B1-15 - Improved Airport operations through Departure, Surface & Arrival Management
- B1-35 - Enhanced Flow Performance through Network Operational Planning
- B1-85 - Increased Capacity & Flexibility through Interval Management

ATS
- B1-05 - Improved Flexibility & Efficiency in Descent Profiles (OPDs)
- B1-31 - Performance Improvement through the application of System Wide Information Management (SWIM)
- B1-35 - Performance Improvement through the application of System Wide Information Management (SWIM)
- B2-15 – Linked AMAN/DMAN

NET
- B1-10 - Improved Traffic Synchronisation and Initial Trajectory-Based Operation
- B1-25 – Improved coordination through multi-centre ground-ground integration (FF-ICE/1 & flight object, SWIM)
- B2-25 – Improved coordination through multi-centre ground-ground integration (FF-ICE/1 & flight object, SWIM)

CNS
- B1-30 - Service Improvement through Integration of all Digital ATM Information
- B1-31 - Performance Improvement through the application of System Wide Information Management (SWIM)
- B2-25 – Improved coordination through multi-centre ground-ground integration (FF-ICE/1 & flight object, SWIM)

Many aspects of the technology roadmaps
Challenges

- Sensitivity of solutions to local situations
  - The issue is not the target but the path to it
  - New good ideas not an exclusivity of Europe or US
  - Buy-in to a well understood common plan is essential

- Need for new interoperable standards
  - How to get them timely, widely recognised

- Need for consistent plans to mutually support **individual** business cases
  - Cooperation within/across regions to optimise synchronised deployments
  - Need for training, change management
  - Need to validate, demonstrate

- Europe can assist a lot, but has to fulfil its own objectives

- Risk of global bottleneck: process, resources, representation (geographical), recognition/endorsement of delegated work
Enablers - Datacom

Do we have a gap?

- ADS-C
- FANS1/A
- Basic CPDLC
- ATNB1
- D-TAXI
- Etc.
- Initial 4D
- Full 4D
- Link capacity issues
- LDACS
- New SatCom
- Airborne access to SWIM (weather, etc)
- Which link?
- Need safe high transfer rates
- Need high transfer rates
- Need connection FMS-data comm.

ICNS 2012
Essential Considerations for Europe & Global Plan

The network of actors & assets

The flight trajectory over time

Measured business performance

Network

Trajectory

Performance

Informed decisions taken collaboratively on early and accurate information

Partnerpship – Interoperability

RPAS

Wake

SWIM and data comm. are cornerstones

“BEBS”
Agenda

- ANConf/12: What is Europe’s response

- Some Critical issues
  - Incentives
  - 4D Trajectory Management
  - Architecture Aspects and Airborne Integration
  - Integration of RPAS in ATM
  - Airport capacity (wake vortex harmonisation)
BEBS, MCBS, ....

Best-Equipped-Best-Served or Best-Efficiency-Best-served or Most-Capable-Best-Served or .............

Two elements;
• Operational service priority
• Economic/Financial incentives!
4D Trajectory Management
Need to:

1) facilitate identification of interoperability requirements
2) map planned evolutions
3) visualise status of capabilities at different times
4) facilitate Airborne Integration
RPAS and ATM

- Integration of RPAS in the ATM is a key priority for the future ATM in Europe.

- Information in Day 2 plenary (tomorrow) covering:
  - European roadmap
  - R&D perspective
  - State of play in Europe
  - Regulatory framework
Airport Capacity – Wake Vortex Considerations

Achievements

RECAT 1
• European and US Regional approach
• European and US Wake data bases
• New knowledge and methodologies
• US Deployment at Memphis shows benefits

Time Based Spacing (TBS)
• TBS head wind procedures validated
• Exploits wake and wind knowledge
• Safety case delivered
• Deployment decision at London Heathrow

CREDOS (cross-wind departure)
WIDAO (CDG closely spaced parallel runway operations)
Wake Vortex: Next Steps

Moving to dynamic pairwise via static pairwise separation

Static Pairwise (RECAT 2)
• Common European and US methodologies
• 100 X 100 aircraft matrix
• Customise categories by airport traffic mix
• Proposal to ICAO for new wake separations provisions

Dynamic Pairwise (RECAT 3)
• Technology development on:
  – Weather Radar
  – Wake detection (Lidar)
  – Down link of aircraft weather parameters
Integrates TBS, Weather Dependent and aircraft sensors
Benefit driven phased approach to deployment
Wake Vortex: Required Commitment

RECAT 2 is a pre-requisite to reaching RECAT 3.

Europe is committed to deliver RECAT 2 together with the US to ICAO in December 2014.

We need to start work on R3 operational and technical scope as soon as possible.
Conclusions

- One size does not fit all, But
  - Solution involving interoperability should be implemented the same way by all
  - Business cases are not independent, but must reflect the conditions of those who invest and operate

- Transition is complex and must be anticipated
  - It is easier to converge when cooperating early

- 12th ICAO Air Navigation Conference
  - The starter of a regular improved planning process

- Interoperability, a constant European consideration