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Multi-Programme Project & ATM

ICNS – 2017

The aircraft and avionics industry perspective - Patrick Schuster, Airbus
What is that?

hedgehog

Design

VOR 1(2)
HF (1/2)

MLS Fw
GPS1 GPS2
VHF1
TCAS Top
SATCOM GEO
Gatelink
ADF1
ADF2
VHF3
ELT

DME1
ATC1 & 2
DME2
MKR
TCAS bottom

Loc Glide
WX Radar 1(2)

Before 60’s 70’s 80’s 90’s Beyond

+ Satcom Ku, Aircell, Live TV, Satcom Ka…
What is that?

Before 60’s

Voice communication

Voice & data Communication

Data transmission

Phraseology

Who is still using this?

Pilot

Controllers

Systems

Close loop

Open loop

CPDLC, ADS-C

EPP (Extended Projected Profile)

Data exchange

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The future of ATM → airborne part

- Trajectory management
- Advanced airborne capabilities for ground-based systems
- World wide navigation & communication
  - New / adapted means (Satcom, LDACS,...)
  - Network technology (IP)
- New airborne standalone capabilities
- Airport operations integrated in the ATM system
- New separation modes
  - Conformance monitoring
  - Conflict detection & resolution
  - Demand & capacity balancing
  - Dynamic Airspace allocation
  - Traffic sequencing
  - ADS B IN (CAVS/CAPP...)
  - Visual lost
  - On EFB / tablet
  - Safety nets (Runway incursion...)
  - Routing on ground
  - Weather On Board

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SESAR Trajectory based operations

Extended Projected Profile:
- Trajectory computed by the FMS
- Up-to-date
- Shared with the ground systems through EPP report datalink application (ADS-C)

What is needed:
- Software upgrade of known piece of equipment (FMS, Displays, Router/application (CPDLC/ADS-C)
- Use of existing com means: VDL Mode2 then Satcom new generation
- Very Large scale Demonstration featuring new operations → trust into ANSP ability to evolve
  - involve a significant number of aircraft from different airlines - based on revenue flights
  - give Airlines the opportunity to measure the benefits
  - synchronization ability between ground and airborne
SESAR/NextGen Harmonisation & Interoperability

Based on a matching of SESAR Avionics roadmap and NextGen Implementation Plan → few changes over the last presentation

Top 4 Harmonisation issues identified:

**ADS-B-Out**
- US/EU requirements but now *similar* timeline

**Datacom**
- US FANS1/A Continental vs EU ATN B1
- Different timeline and content for ATN B2

**Trajectory Based Operations**
- SESAR I4D vs FAA TBO

**ADS-B-In**
- SESAR ASPA vs FAA FIM-S
ATM Avionics roadmap – Airbus path

ICAQ Block 0

2009

AP-TCAS
ADS-B out *
ATSAW

RNP .1
GLS Cat1 *
AMM/BTV/ROP

FANS A+/FANS B+ *

2013

Block 1

2018

LPV (A350) *

Pilot Common Project

4D

FANS A/C *

Block 2

2023

ATSA-SURF/ IA

CAVS / CAPP

Initial GBAS CAT 3

D-TAXI

Full-4D

Block 3

Full GBAS CAT 3

New COM Media

Availability of functions subject to development launch decision

* = additional equipment required on ground
Conclusion

• ATM modernisation
  - Is a must for air transportation
  - Requires further integration of airborne and ground systems
    ▪ Existing
    ▪ Future
  - Requires ground/ground (SWIM) and air/ground communication bandwidth for new services and automation
  - Major changes supported by advance tools for the ATCO

• Need for trust, and, leadership
  - Commitment: new roadmap cycles are ending by left to right slippage
  - Visibility on strategies
  - Where Air / Ground development are needed, shared /synchronised deployment

• Air/Ground worldwide ‘Interoperability’ must be actively promoted and phase-out/accommodation by the ground considered