Context of ATM communications in Europe

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SESAR: Single European Sky Air Traffic Management Research Programme

- Initiative from the aerospace industry, sponsored by Eurocontrol and the European Commission.
- Aim: create a new ATM infrastructure for 2020+ able to support
  - 3 × increase of air traffic
  - 10 × increase of safety
  - 10% less pollution
  - ... at half the current cost

- One of SESAR’s targets is Air Traffic Management communications between the cockpit of the aircraft and Air Traffic Control

- SESAR stakeholders are creating a Joint Undertaking that will have design authority for this new ATM system
Future Aeronautical Communications
Most likely based on IP protocol

Always Best Connected

IP Ground Infrastructure (PEN)

New Link(s)  ATN-VDL-2  ACARS

1090 ES / New Link

VHF 25/8.33

RADAR

courtesy Eurocontrol

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courtesy Eurocontrol
SESAR D3 draft initial recommendations
(Extract)

- SATCOM voice for oceanic area.

- New integrated FCI communications system including:
  - A terrestrial A-G datalink component (VDL2, complemented by new technology)
  - A new satellite A-G datalink.
  - Airport surface data coms – IEEE 802.16aero supports ATS and AOC
  - Ground-ground data transport network shared for voice and data technologies – cost efficiencies.
  - Software radios (and flexible architecture) become available to aid avionics integration and global interoperability.

- As part of the new FCI, improvement of existing ATN or specific IP transport layer to support end to end QoS management for continental ATS use. Oceanic requirements to be integrated.
  - Integrated avionic supporting integrated continental/oceanic services.

- Evaluate digital voice for Air Ground communications.
The Service Provision Regulation

According to Regulation 2004/550 any ATM, CNS, AIS or MET service provider must be certified by a National Supervisory Authority on the basis of demonstration of compliance with the Common Requirements Implementing Rule (2004/2096) to provide those services.

Among the requirements to comply with are the following:

– setting up of an approved Safety Management System
– acceptance of a full liability in case of service provision failure that is proved to be the cause of an accident
– provision of a business plan to prove the sustainability of the service provision for at least five years

According to the principle of reciprocity a Service provider certified in one European member state is automatically recognized by the other European member states.
The Interoperability Regulation

• There is no system certification (except the aircraft part that is covered by the EASA regulatory framework) as such as far as the legislation lies upon the self declaration concept.

• The unique exception regards safety aspects for which an approval of the safety study by the NSA before putting the system in operations (ESARR 4 as required by the 2096 regulation)
The standardisation hierarchy (1/2)

• Interoperability objective is one of the primary objective of the ICAO mission in particular when aircraft interactions with ground based system are foreseen:
  – Annexes to the Chicago Convention provide the necessary regulatory standards to ensure this global interoperability
    • the current trend at ICAO level is to limit the content of the Annexes to high level requirements
    • this is more and more completed by Manual containing all the detailed technical materials (but those documents have no legal value)
  – The ICAO standards are completed by equipment technical standards usually developed by EUROCAE and/or RTCA
    • for the airborne equipments they are recognized within the airworthiness process as acceptable means of compliance to the regulations
    • for ground equipments they could be referenced within SES CS and be also recognized as means of compliance to the SES regulations

Courtesy DSNA – L. Deneufchatel, SATM final meeting
The standardisation hierarchy (2/2)

• The SES interoperability regulation is dealing with those elements that are not fully covered at ICAO level. It shall address:
  – The mandates applicable to both ANSP and airspace users for deployment of new system, function or technology
  – The development of common ATM infrastructure interchangeable components to facilitate the emergence of the FAB and to reduce the overall system development and possession cost

Courtesy DSNA – L. Deneufchatel, SATM final meeting
The ATM SATCOM case (1/2)

• ATM SATCOM must by definition be standardized at ICAO level
  – Being compliant with the new high level SARPs
  – Being describe within a dedicated manual that supposes that all the system functions and characteristics have been dully demonstrated and validated

• SES could play a role by providing an air carriage mandate applicable to designated part of the airspace as a result of a public consultation of all the stakeholders

Courtesy DSNA – L. Deneufchatel, SATM final meeting
The ATM SATCOM case (2/2)

• Regarding the service provision ATM SATCOM service provider should be certified as an ANSP (communication domain only) but this is still a subject of debate at EC level

  – This implies to be compliant with the 2096 Regulation as expressed before
  – This implies also that the ATM SATCOM service provider takes the full liability for the service provided

Courtesy DSNA – L. Deneufchatel, SATM final meeting
ESA constraints:

- Respect SESAR schedule
- Have the support of the users (represented by the EU, Eurocontrol, Air Navigation Service Providers and SESAR stakeholders)
- Limit ESA investment to well defined phases conditioned by the successful acceptance by the aviation community of the results of the previous phase
- Retire the risk for industry, in terms of acceptance by the aviation community rather than technical risk which, thanks to the work done to date, is relatively less critical.
SESAR schedule vs Iris schedule

- **DEFINITION PHASE**
  - SESAR JOINT UNDERTAKING
  - CREATION OF IRIS PROGRAMME

- **DEVELOPMENT PHASE**
  - PHASE 1: ESA MINISTERIAL COUNCIL 2008
  - PHASE 2: ESA MINISTERIAL COUNCIL 2011 & 1st SATELLITE LAUNCH

- **DEPLOYMENT PHASE**
  - PHASE 3