

**Fourteenth Meeting of the Cross Polar Trans East Air Traffic Management Providers' Work Group
(CPWG/14)**

(Chicago, USA – 10-14 December 2012)

**Agenda Item 8: Communication, Navigation, Surveillance (CNS) and Air Traffic Management
(ATM) Issues**

Globally-Interoperable CNS/ATM

(Presented by the International Coordinating Council of Aerospace Industries Associations [ICCAIA])

SUMMARY

This paper presents information concerning the efforts of certain ICCAIA members (Boeing and Airbus) to cooperatively promote globally-interoperable CNS/ATM solutions.

1 Introduction

- 1.1. Please see the attached presentation.

2 Discussion

- 2.1. Discussion is based on the attached presentation.

3 Recommendation

- 3.1. The Meeting is invited to note the information provided in the attached presentation.



Globally-Interoperable CNS/ATM

Mike Matyas, Boeing

Jean-François Bousquie, Airbus

CPWG/14 December 2012

Introduction

- Airbus and Boeing coordinate to promote globally-interoperable CNS/ATM solutions
 - Our customers operate their aircraft across the world
 - Divergent regional CNS/ATM solutions carry penalties
 - Technical – different avionics requirements
 - Operational – different flight crew procedures
 - In mid-2000s, “Mermoz” framework established
 - A similar framework in the near future is possible
 - Accelerate and harmonize NextGen and SESAR
 - Establish common implementation path toward TBO
 - Informal collaboration in the context of industry working groups is more common

Communication

- Boeing and Airbus worked together with our aircraft operator customers to charter RTCA SC-214 / EUROCAE WG-78 to develop Baseline 2 (B2) ATS datalink capability
 - Given divergent FANS-1/A and Link 2000+ (implemented B1) paths, ICAO accepted proposal to develop B2 as target for global convergence
- Future capabilities
 - Applications: B2 4DTRAD and D-TAXI
 - Infrastructure: IP-based FCI (SwiftBroadband, Iridium NEXT, AeroMACS, LDACS)

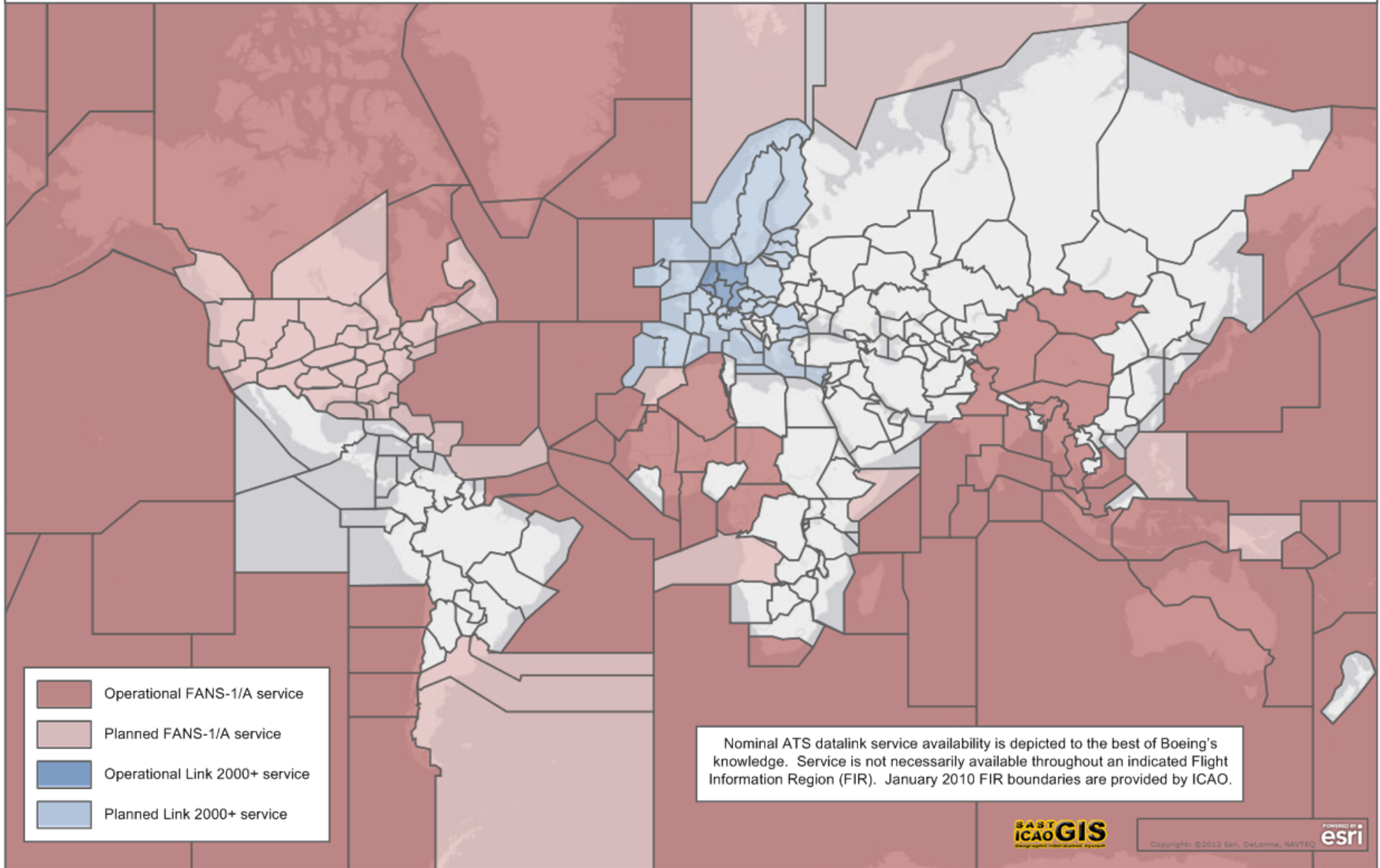
Divergent Communication Paths



Air Traffic Service (ATS) Datalink Map

July 2012

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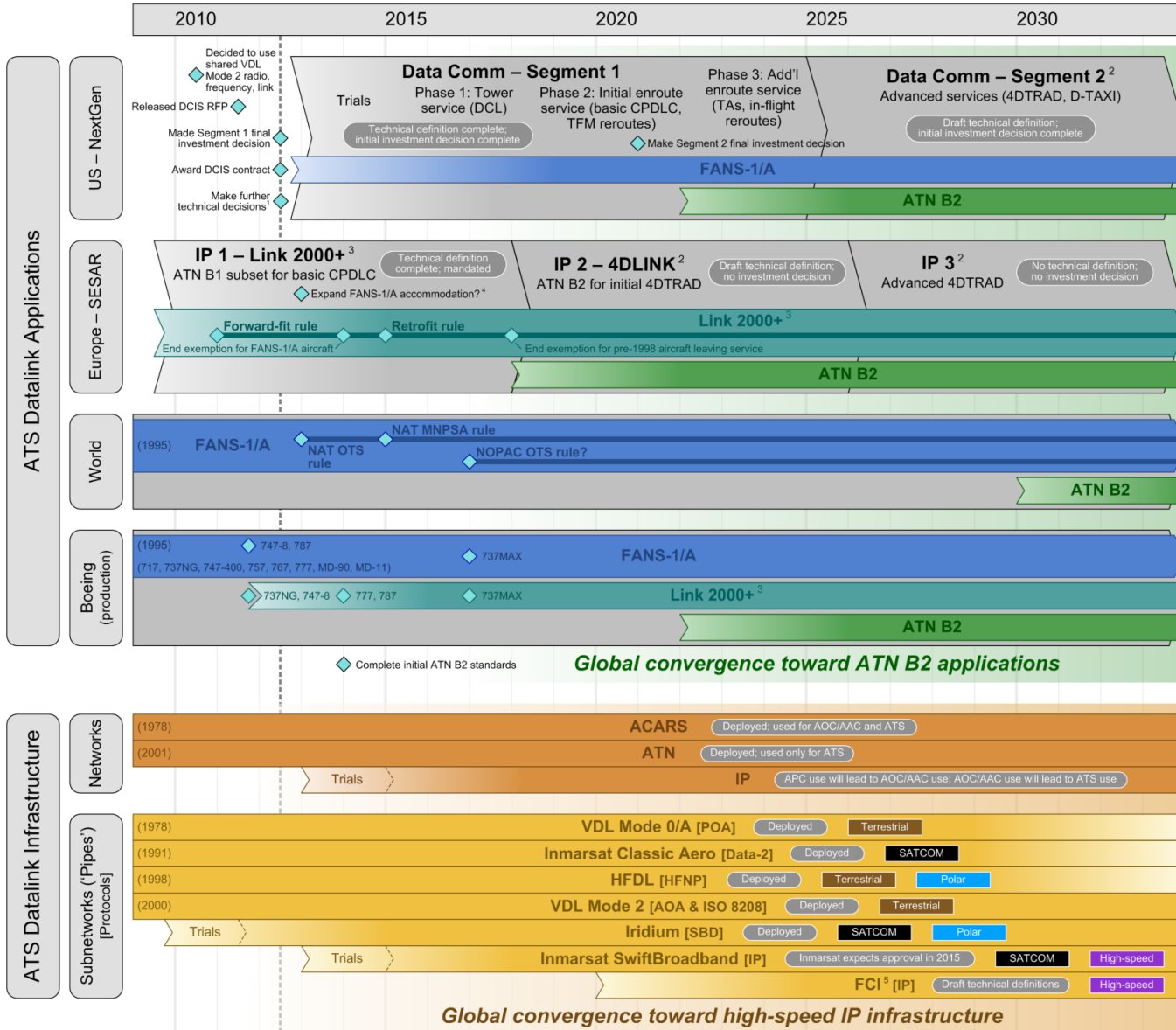
Future Communication Capabilities



Air Traffic Service (ATS) Datalink Timeline

June 2012

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¹ Further technical decisions include:

- Require FMC-integrated datalink?
- Support Link 2000+ applications?
- Support A623 applications?
- Allow FANS-1/A over POA?
- Require FANS-1/A+?

² Identified program start dates reflect stated plans, but are not necessarily consistent with investment commitments for deployment of ground infrastructure and/or with industry expectations for availability of aircraft equipage

³ Specifically the operational (as opposed to 'pioneer') Link 2000+ program that requires PM-CPDLC

⁴ FANS-1/A service in Europe is currently limited because only a small number of European ATSPs offer FANS-1/A service and those ATSPs support only a small subset of FANS-1/A capability

⁵ Along with Inmarsat SwiftBroadband, potentially Iridium NEXT, AeroMACS, and/or LDACS

4DTRAD: Four-Dimensional Trajectory for Datalink
AAC: aeronautical administrative communications
ACARS: Aircraft Communications Addressing and Reporting System
AeroMACS: Aeronautical Mobile Airport Communications System
AOA: ACARS over AVL
AOC: aeronautical operational communications
APC: aeronautical passenger communications
ATN: Aeronautical Telecommunications Network
ATSP: ATS provider
AVLC: Aviation VHF Link Control
B1: Baseline 1
B2: Baseline 2
CPDLC: Controller-Pilot Data Link Communications
DCIS: Data Comm Integration Service
DCL: Departure Clearance
D-TAXI: Datalink Taxi
FANS: Future Air Navigation System
FCI: Future Communications Infrastructure
HF DL: HF data link
HFNP: HF network protocol
IP (network): Internet Protocol
IP (SESAR): Implementation Plan
LDACS: L-Band Digital Aeronautical Communication System
MNPSA: Minimum Navigation Performance Specification Airspace
NAT: North Atlantic
NOPAC: North Pacific
OTS: Organized Track System
POA: "Plain Old" ACARS
SATCOM: satellite communications
SBD: Short Burst Data
SESAR: Single European Sky ATM Research
TA: Tailored Arrival
TFM: Traffic Flow Management
VDL: VHF Digital Link

Navigation

- Airbus and Boeing working together to help industry and regulators define Flight Operational Safety Assessment (FOSA) guidelines for PBN
 - Initial target is RNP Authorization Required (AR) approaches
- Future capabilities
 - Initial 4D TBO with time of arrival control (TOAC)
 - TOAC achieved with required time of arrival (RTA) or speed schedule functions
 - Ground-Based Augmentation System (GBAS) Cat II/III approaches

Surveillance

- Boeing and Airbus worked together in RTCA SC-186 / EUROCAE WG-51 to develop DO-260B / ED-102B ADS-B Out MOPS
- Future capabilities
 - ADS-B In applications
 - Surface situational awareness with Indications and Alerts (SURF-IA)
 - Flight deck-based Interval Management for Spacing (FIM-S)
 - Others

Air Traffic Management

- Airbus and Boeing participating in TopFlight (SESAR) and AirBridge (NextGen) development
 - Aimed at developing traffic flow management techniques for North Atlantic traffic flows to increase efficiency of arrivals at busy coastal airports
 - Techniques expected to be applicable to other regions
- Reciprocal projects
 - Boeing is contributing to Airbus's portion of SESAR Project 9.49 (Global Interoperability – Airborne Architecture and Avionics Interoperability Roadmap)
 - Airbus participated in Boeing's Interoperability OTA effort for the FAA

Globally-Interoperable CNS/ATM (1/3)

- **Boeing and Airbus cooperatively working with FAA and Eurocontrol to incorporate needs from other areas of the world into NextGen and SESAR regional programs in order to promote globally-interoperable CNS/ATM solutions**
 - Airbus and Boeing are aware of CNS/ATM needs across the globe because of our worldwide customer bases
 - E.g., Boeing helped to involve non-US airlines in Tailored Arrival (OPD/CDA) development with FAA to ensure US procedures were developed in harmony with existing worldwide procedures

Globally-Interoperable CNS/ATM (2/3)

- In parallel, **Airbus and Boeing assist in bringing globally-interoperable CNS/ATM solutions to ICAO for worldwide adoption and deployment**
 - E.g., OPLINKP is reviewing draft B2 CPDLC message set as revision to ICAO Doc 4444 CPDLC message set
- From State's perspective, this is how process to achieve global interoperability should work
 - State may provide input via working group (e.g., NAT CNSG) participation
 - State may express concern via State letter in response to proposed documents and amendments

Globally-Interoperable CNS/ATM (3/3)

- To summarize, **Boeing and Airbus cooperatively promote globally-interoperable CNS/ATM solutions by working simultaneously with regional programs and with ICAO**
 - Airbus and Boeing also collaborate in RTCA, EUROCAE, ARINC, and other industry groups (e.g., IPACG, ISPACG, FIT-Asia, JURG) to support this effort
 - Boeing and Airbus hope to participate in future CPWG meetings in order to work toward our common goals, including globally-interoperable CNS/ATM solutions