

Future Aeronautical Communication System - FCI

**Nikos Fistas,
EUROCONTROL/CND**

**9th ICNS Conference
Arlington, May 13-15 2009**




Content

- ⇒ Context-History
- ⇒ Current ECTL activities
- ⇒ International Perspective
- ⇒ SESAR dimension
- ⇒ What's next

What has already happened?

Key events

- ⇒ 11th ANConf
- ⇒ EUROCONTROL/FAA AP17 Activities 
- ⇒ SESAR Definition Phase completion
- ⇒ ICAO ACP endorsement
- ⇒ SJU establishment





ato
AIR TRAFFIC ORGANIZATION



MITRE



- ☑ FAA/NASA and EUROCONTROL
- ☑ Response to AN-Conf/11 outcome
- ☑ Contributions from France, Germany, Spain, Sweden, UK and ESA
- ☑ International Coordination and Communication (ACP, Conferences)

6 Technical Tasks

- Improvements to current systems
- Concept and Requirements
- Technology Evaluations
- Communication Roadmap
- Integration Aspects
- Spectrum Aspects

3 Business Tasks

- International Perspective
- Industry Participation
- Business Aspects

- ☑ Supporting SESAR and NextGEN
- ☑ Recommendations and Actions



QinetiQ



AP17 – General Observations

- The future system must support **ATS** and **AOC** end-to-end communications including **air/ground** and **air/air**
- Emphasis first in data communications – digital voice in a next step
- **No single technology** meets all requirements across all operational flight domains
- The future system will be a **system of systems** integrating **existing communication systems** (voice, VDL) as well as **new communications systems** to meet the operational requirements
- No COTS technologies have been identified that can be adopted as new components of the future system without some modification

AP17 - Data Link Recommendations

3 New
Components:
Data link

Airport surface: C band

General terrestrial: L Band

Satellite: Oceanic + Continental



FCI activities in ECTL

AP17 - Data Link Recommendations

3 New
Components:
Data link

Airport surface: C band

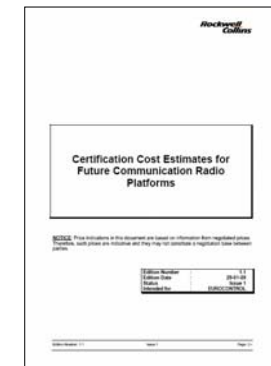
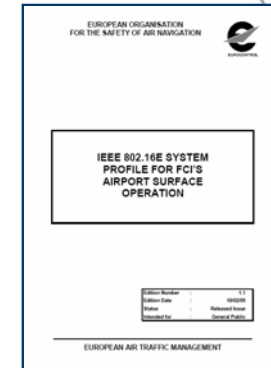
General terrestrial: L Band

Satellite: Oceanic + Continental

Airport Surface Communications System

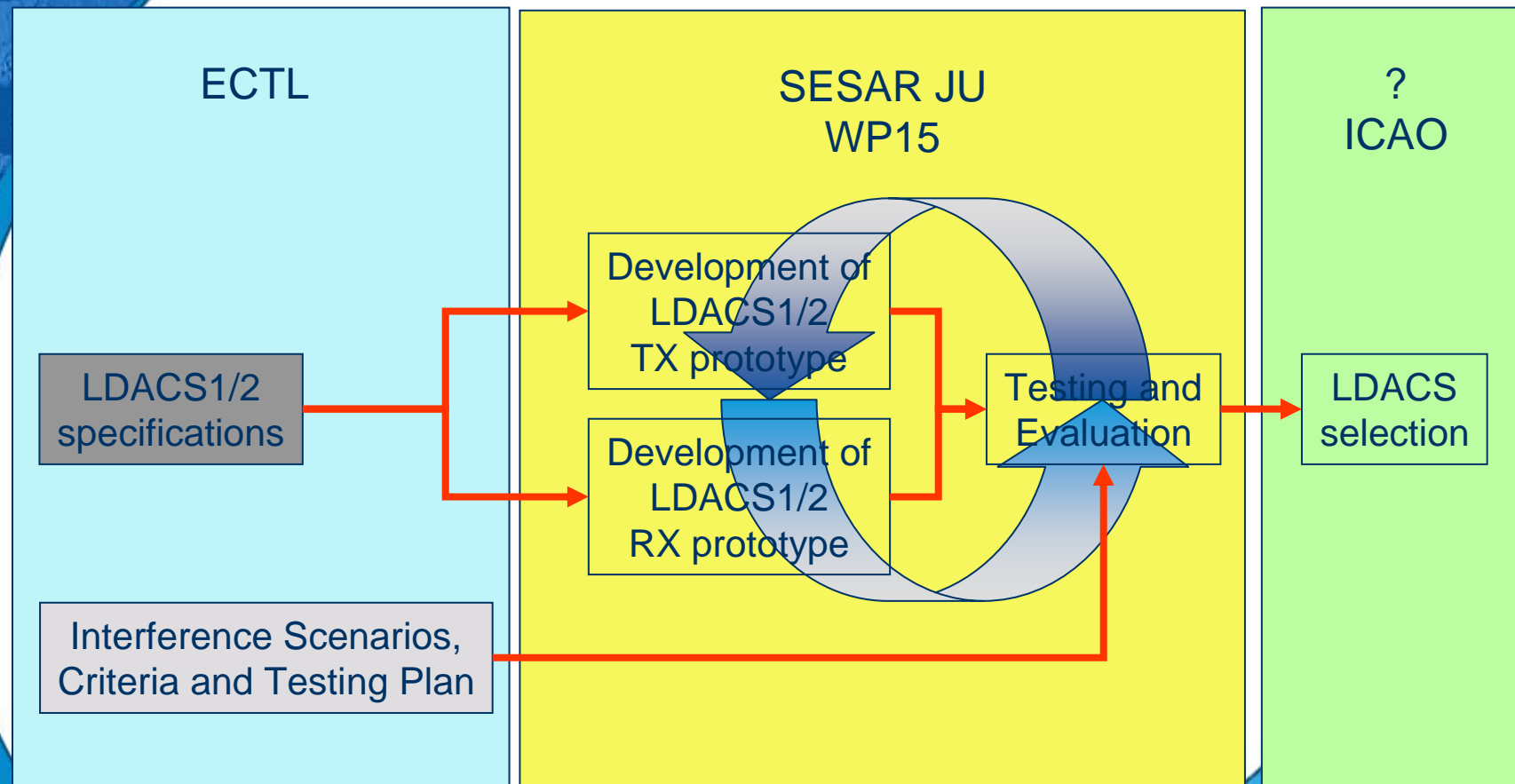
Airport Surface System Activities

- Study - identification of potential 802.16e profiles for aviation
 - Report available
- Study – certification cost estimation (of OFDMA based FCI component)
 - Report available
- Participation in SJU activities (P15.2.7 and P9.16)
- Info/reports at:
www.eurocontrol.int/communications/public/standard_page/WIMAX.html



LDACS: Continental Communications system

Plan for LDACS development activities



2009

2010?




20??



LDACS System “Success Criteria” – High level Objectives

- Can operate in the L band without interfering with existing users of the band
- System performance is meeting requirements
- System development is facilitated and expedited through the choice of appropriate components and/or mature standards.

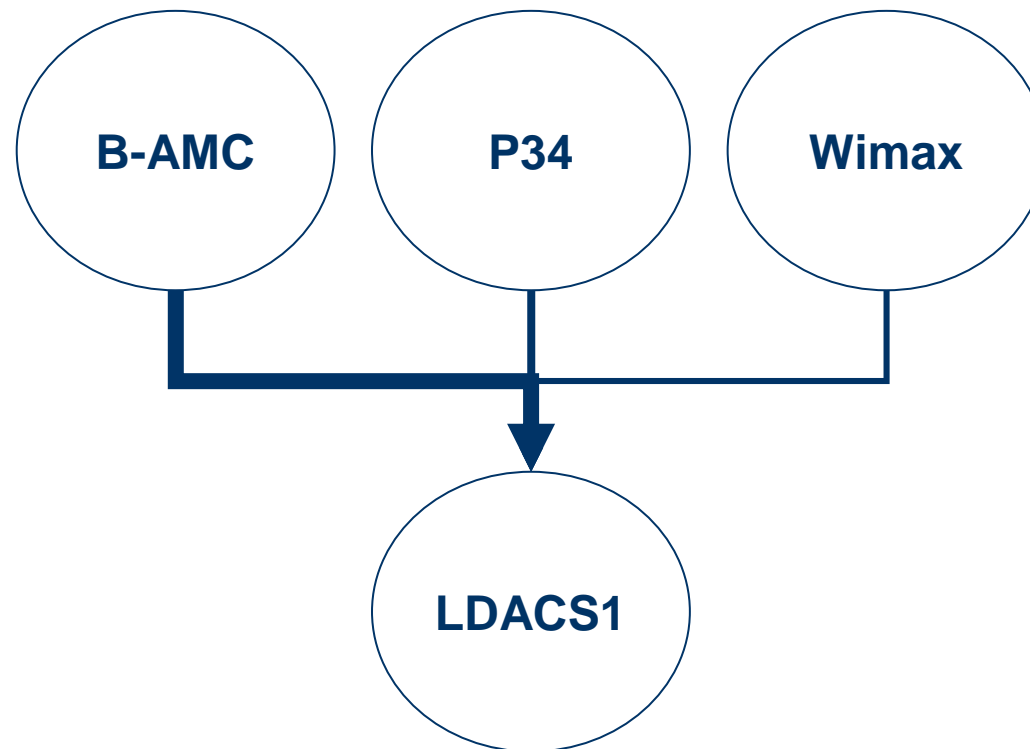
LDACS System Activities

- LDACS1 system specifications 
- LDACS2 system specifications 
- L band systems compatibility criteria and Interference Scenarios 
- Participation in SJU activities (P15.2.4)
- Info/reports at:

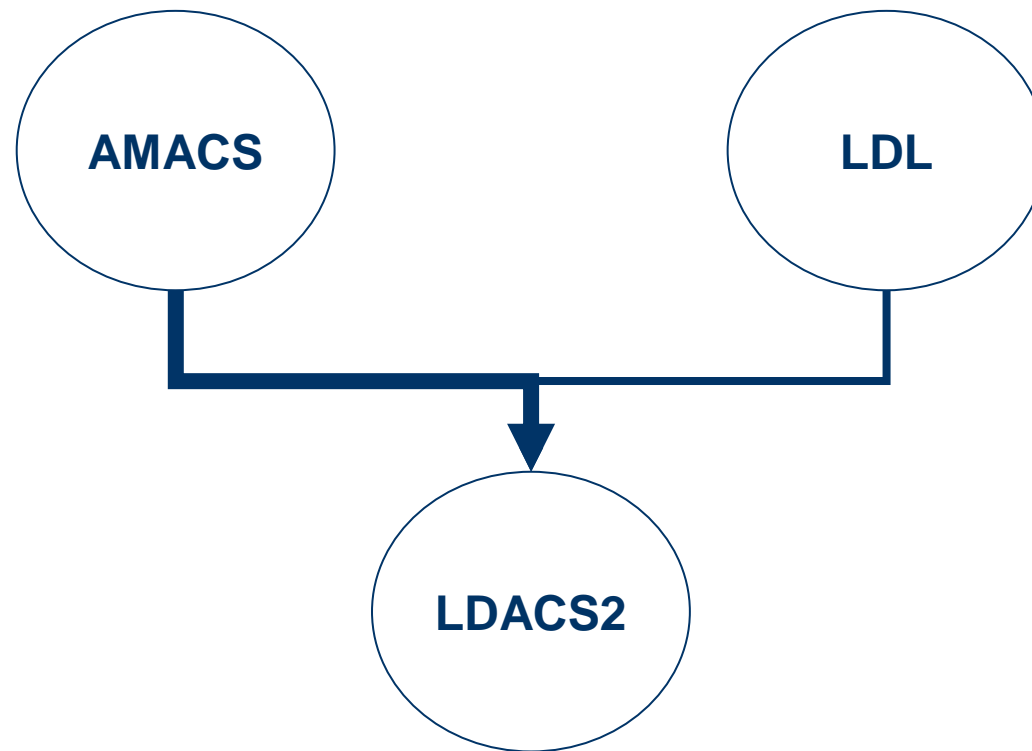
www.eurocontrol.int/communications/public/standard_page/LDACS.html



LDACS1 System



LDACS2 System



LDACS1/2 studies: Objective and deliverables

Objective: Provide input to SJU activities (Project 15.2.4) by developing initial specifications for the LDACS1/2 system

Deliverables:


- L-DACS1/2 System Overall Specifications
- Design Specifications for LDACS1/2 Tx and Rx prototypes
- Deliverables to be finalised by May 2009

LDACS1/2 studies: Current status

- LDACS1
 - D2 Deliverable
 - Draft D3 Deliverable

- LDACS2
 - D2 Deliverable

EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION




L-DACS1 System
Definition Proposal:
Deliverable D2

Edition Number	:	1.0
Edition Date	:	13/02/2009
Status	:	Final
Intended for	:	General Public

EUROPEAN AIR TRAFFIC MANAGEMENT

EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION




L-DACS1 System Definition
Proposal:
Deliverable D3 - Design
Specifications for L-DACS1
Prototype

Edition Number	:	1.0
Edition Date	:	01/04/2009
Status	:	Final
Intended for	:	General Public

EUROPEAN AIR TRAFFIC MANAGEMENT

EUROPEAN ORGANISATION
FOR THE SAFETY OF AIR NAVIGATION



L-DACS2 System Definition
Proposal:
Deliverable D1

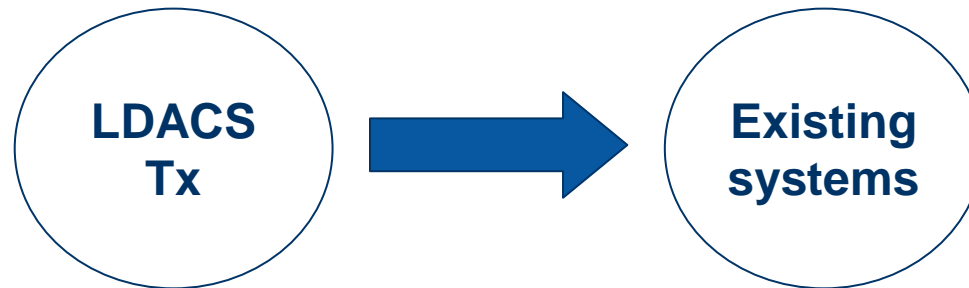
Edition Number	:	v0.24
Edition Date	:	11 th March 2009
Status	:	Draft
Intended for	:	General Public

EUROPEAN AIR TRAFFIC MANAGEMENT

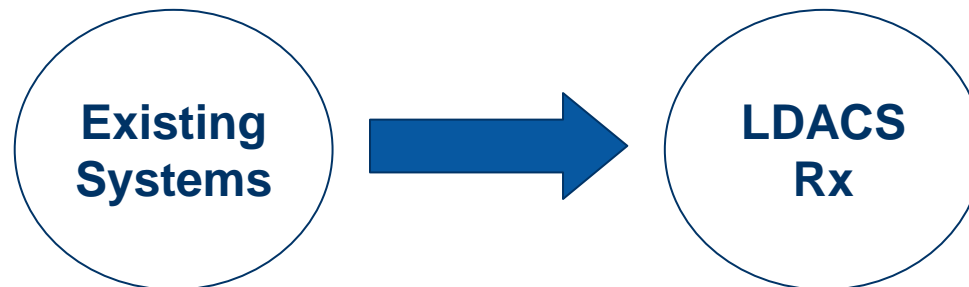


Criteria and Scenarios Study expected outcome

➤ Development of Spectrum Compatibility Criteria

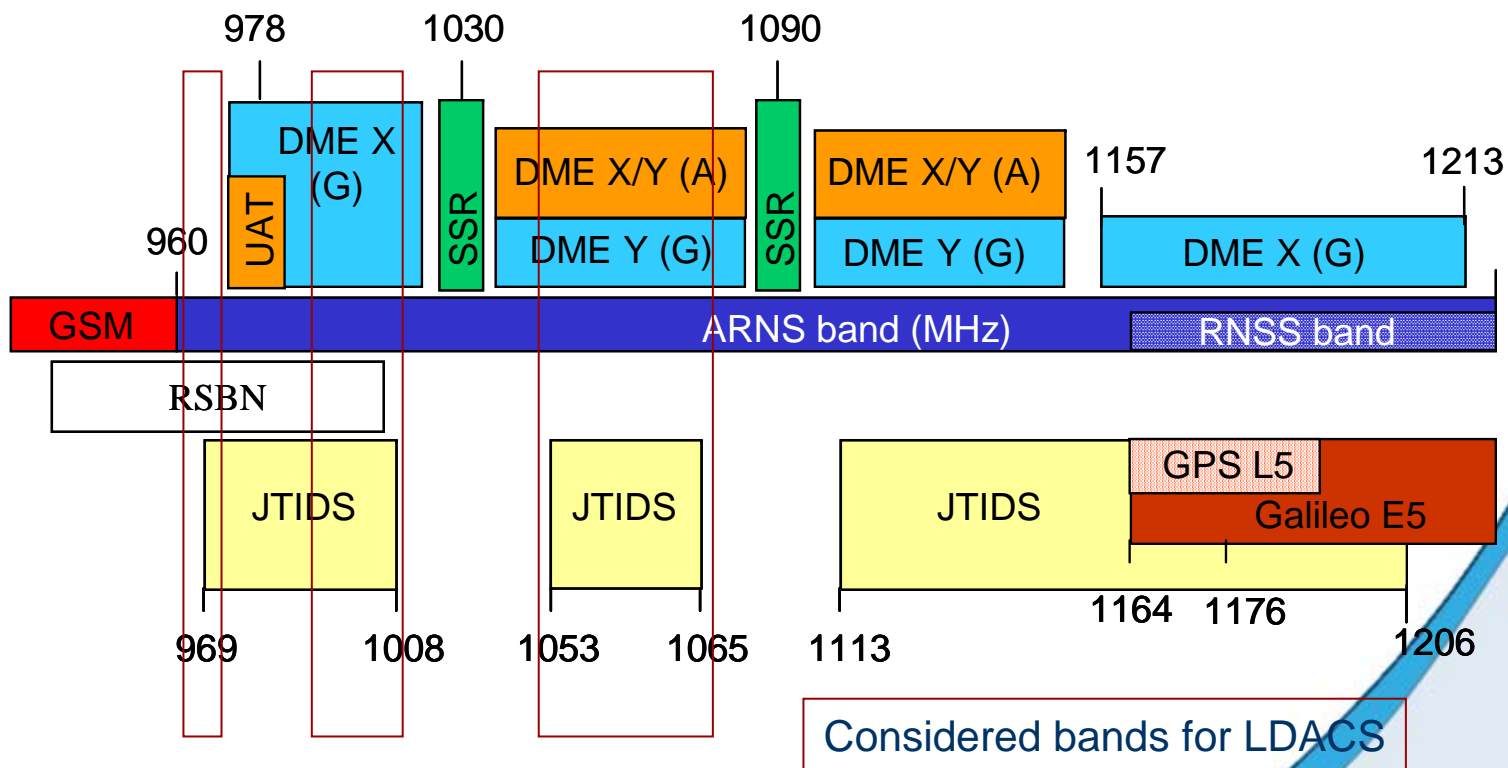


➤ Development of Critical Interference Scenarios



Compatibility Criteria

➤ Systems to consider



➤ Cases

- Ground and airborne scenarios
- Cosite – limitations of using suppression bus

Interference Scenarios

- Systems to consider
 - Previous case (compatibility criteria), and
 - JTIDS/MIDS

- Cases
 - Ground and airborne scenarios
 - Cosite

Criteria and Scenarios study key deliverables

- Compatibility Criteria for system X
- Testing Plan for system X
- Interference Scenarios for system X
- Cosite case: use of suppression bus and interference scenarios

- Deliverables are expected by May 2009

Satellite Communications System

Satellite Communication System

- Short term objectives:
 - ⇒ Agreement on a global new satellite communication standard
 - ⇒ Update of AMS(R)S SARPs

- Close cooperation with ESA – support for the Iris project

- Participation in SJU activities (P15.2.6)

- Info at:
www.eurocontrol.int/communications/public/standard_page/SATCOM.html

International Cooperation

Cooperation with FAA on FCI matters

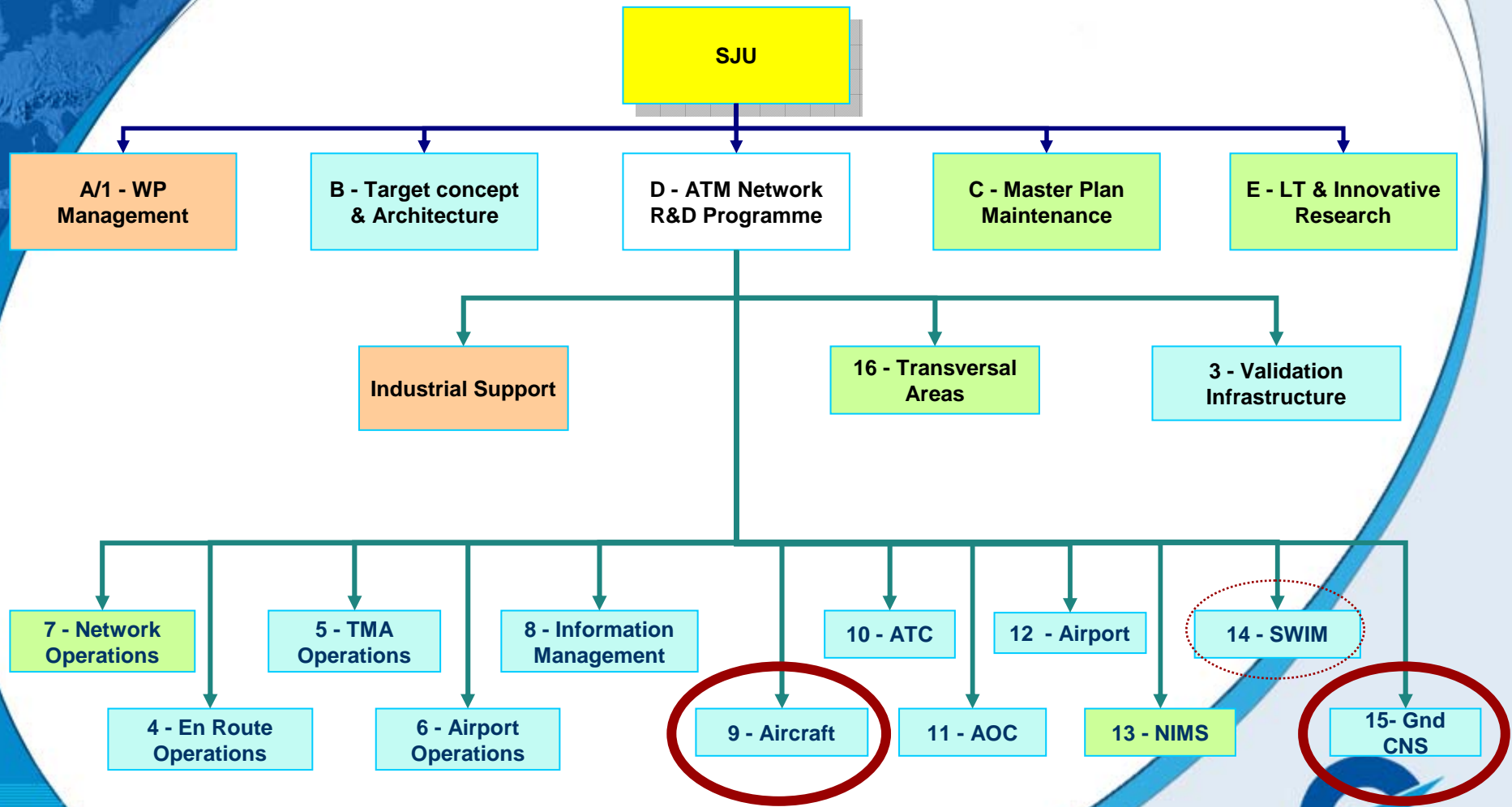
- Proposal to cover 3 key areas of work:
 1. Facilitate technical coordination between SESAR and NextGen
 2. Joint technical investigations
 - Airport Surface System – C band
 - Continental system - L band system
 - Satellite Communications System
 - Integration aspects
 3. Joint contributions/submissions to standardisation bodies

SESAR context

Current Situation: SJU WP Definition

- Since April 2008: intense collaborative work involving the partners
 - 15 members selected in Sept. 07 and EUROCONTROL
- Description of Work (DOW)
 - Initial offers mid-September
 - Prioritisation and refinement led to DOW 4.0
 - Invitation to submit Binding & Final Offer published on 17 December
- 16 February 2009: submission of binding offers for majority of work packages
- Selection of partners is now finalised

SJU WBS



Communication Projects in SESAR (1/2)

WP9: Aircraft

- **Project 9.16: New Communication Technology at Airport**
- *Project 9.19Swim Air-Ground Capability*
- *Project 9.20: Military data link accommodation*
- *Project 9.21: ADS-B - 1090 Higher Performance Study*
- *Project 9.22: Mid & Full ADS-B Capability*
- *Project 9.24: ADS-B In/Out for military aircraft*
- **Project 9.44: Flexible Communication Avionics**

Communication Projects in SESAR (2/2)

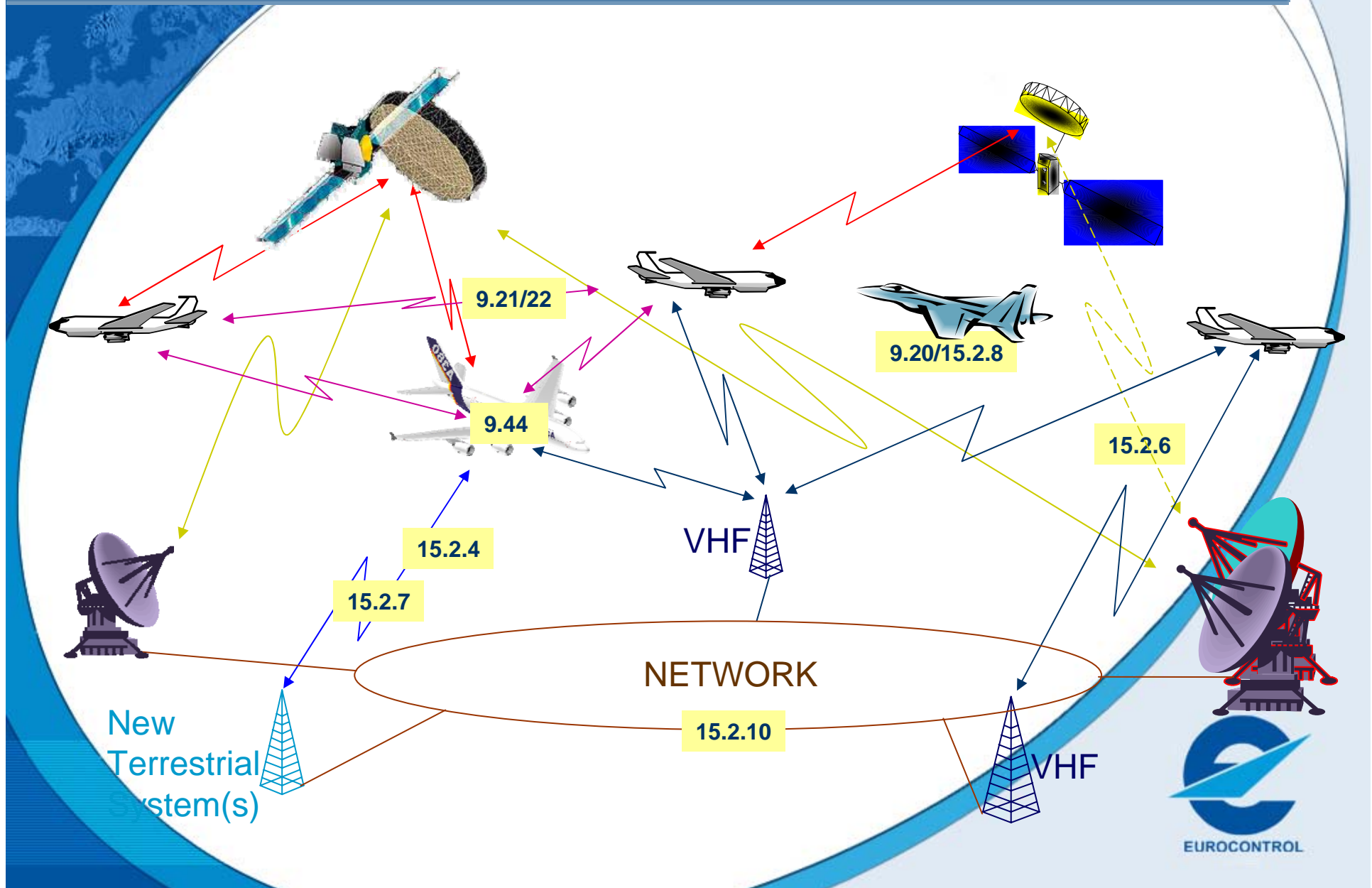
WP 15: Ground CNS Infrastructure

- SWP 15.1: Common CNS Studies
 - Project 15.1.6: Spectrum Management & Impact Assessment

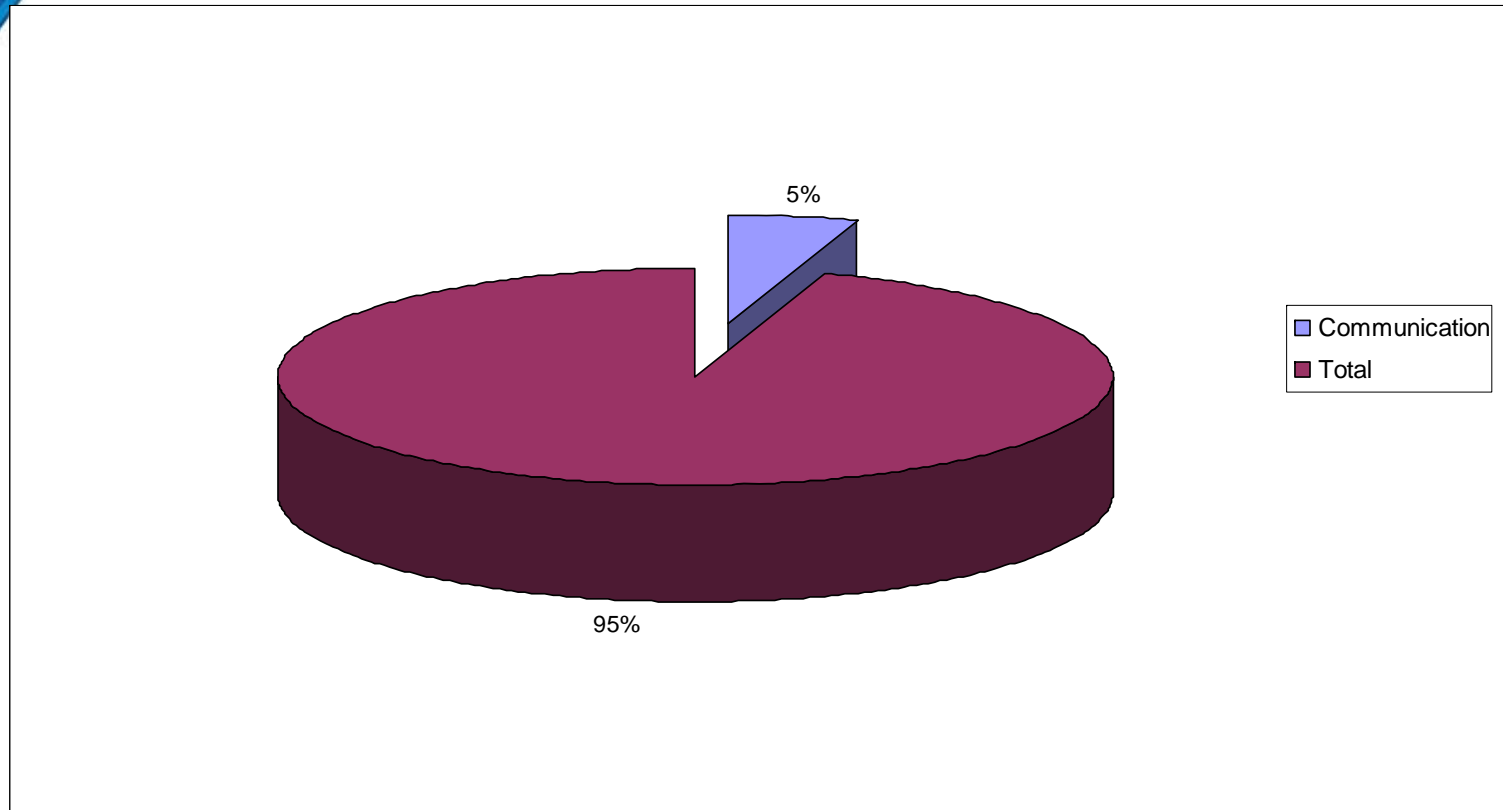
- SWP 15.2: Communication
 - **Project 15.2.4: Future Mobile data Link system definition**
 - **Project 15.2.6: Future Mobile Satellite Communication**
 - **Project 15.2.7: Airport Surface Data link**
 - *Project 15.2.8: Civil-Military Data Link Interoperability*
 - *Project 15.2.10: Terrestrial communication infrastructure - SWIM backbone*

- SWP 15.3: Navigation
- SWP 15.4 : Surveillance

FCI: ATM Communications in 2020+ and SJU projects



Com Projects budget in SJU



Next Steps

What's Next:

- Finalization of SJU agreements
- Progressive initiations of SJU projects
 - Ramp-up period
- Swift Progress of FCI key activities
- Preparation of WRC2011
- Maintain International Context (ICAO, NextGen, other regions)

THANK YOU

Questions?



Back Up Slides

AP17 Results

L-DACS

United States	Common Technologies	Europe
Continental <ul style="list-style-type: none">•P 34/TIA-902•LDL•W-CDMA	<ul style="list-style-type: none">•P 34/TIA-902•LDL•W-CDMA	Continental <ul style="list-style-type: none">•B-AMC•AMACS•Custom Satellite
Oceanic/Remote <ul style="list-style-type: none">•Inmarsat SBB•Custom Satellite	<ul style="list-style-type: none">•Inmarsat SBB•Custom Satellite	Oceanic/Remote
Airport <ul style="list-style-type: none">•IEEE 802-16e	<ul style="list-style-type: none">•IEEE 802-16e	Airport

L band system: Development and Deployment Plan

