Future Aeronautical Communication System - FCI

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EUROCONTROL/CND

TAKE OFF Conference
Salzburg, April 21st 2009

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Content

- ⇨ Context-History
- ⇨ Current ECTL activities
- ⇨ SESAR dimension
- ⇨ What’s next

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What has already happened?

Key events

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

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AP17 in a slide

- ☑ 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	3 Business Tasks
– Improvements to current systems	– International Perspective
– Concept and Requirements	– Industry Participation
– Technology Evaluations	– Business Aspects
– Communication Roadmap	
– Integration Aspects	
– Spectrum Aspects	

- ☑ Supporting SESAR and NextGEN
- ☑ Recommendations and Actions

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

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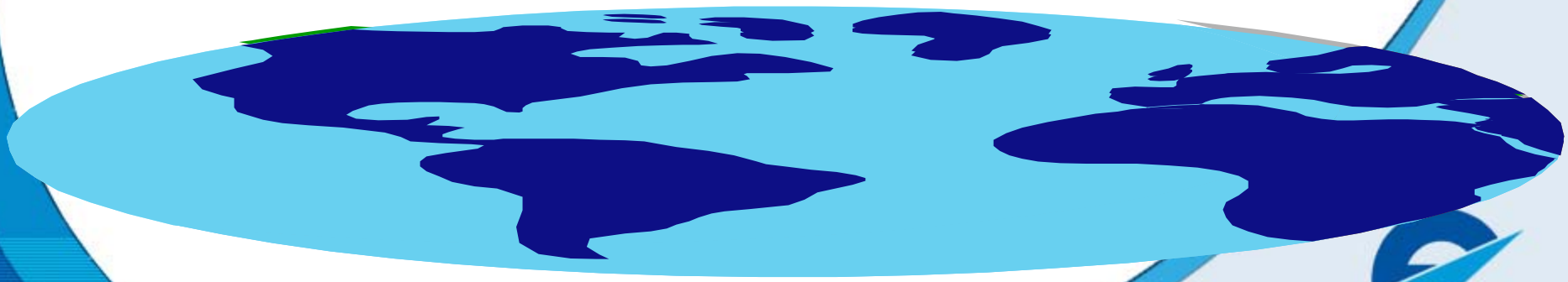
AP17 - Data Link Recommendations

3 New Components: Data link

Airport surface: C band

General terrestrial: L Band

Satellite: Oceanic + Continental



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FCI activities in ECTL

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AP17 - Data Link Recommendations

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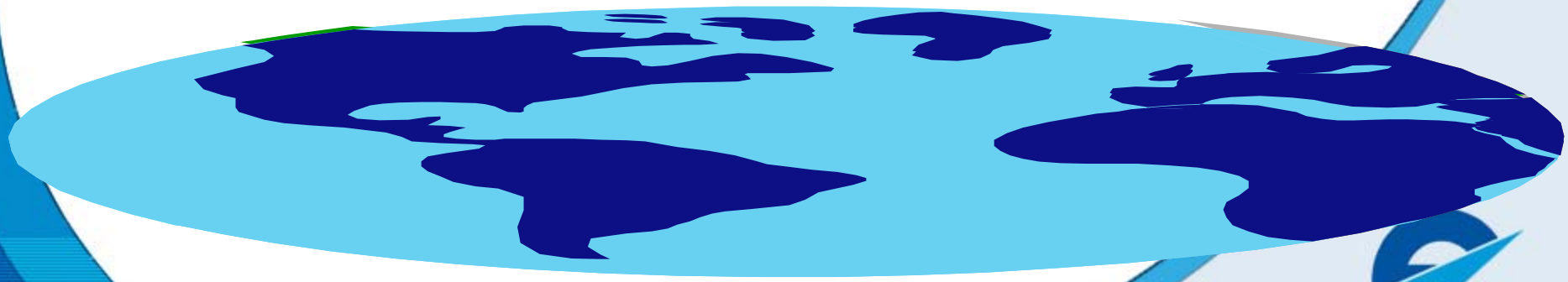

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Airport Surface Communications System

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Airport Surface System Activities

- Study - identification of potential 802.16e profiles for aviation
  - Report available


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IEEE 802.16E SYSTEM PROFILE FOR FCI'S AIRPORT SURFACE OPERATION

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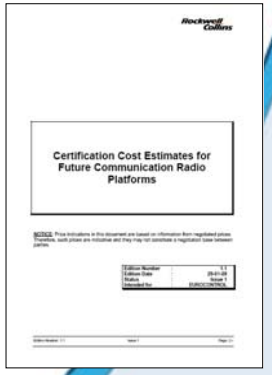
- Study – certification cost estimation (of OFDMA based FCI component)
  - Report available


Rockwell Collins

Certification Cost Estimates for Future Communication Radio Platforms

- Participation in SJU activities (P15.2.7 and P9.16)

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

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LDACS: Continental Communications system

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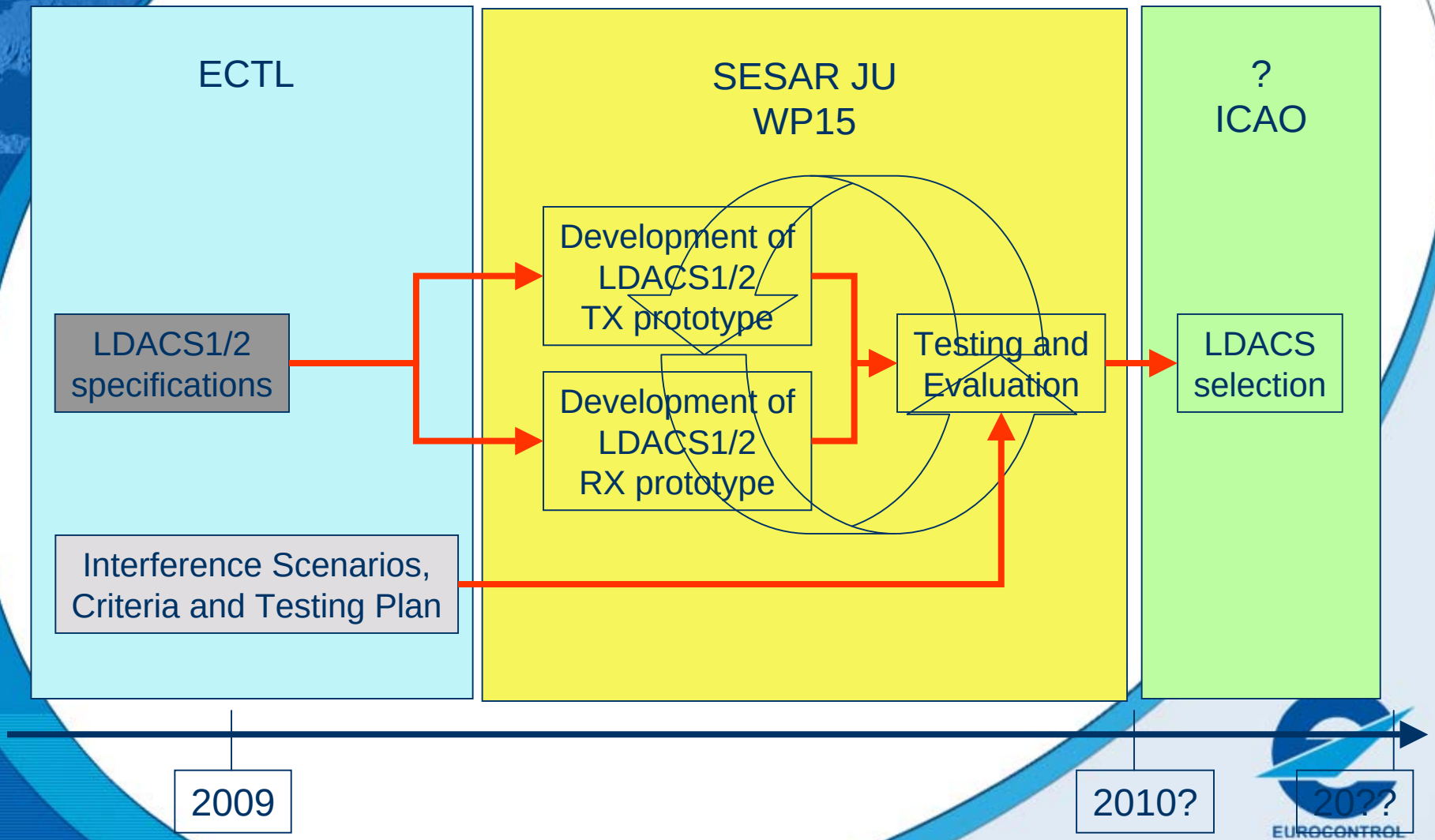
Plan for LDACS development activities



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.

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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

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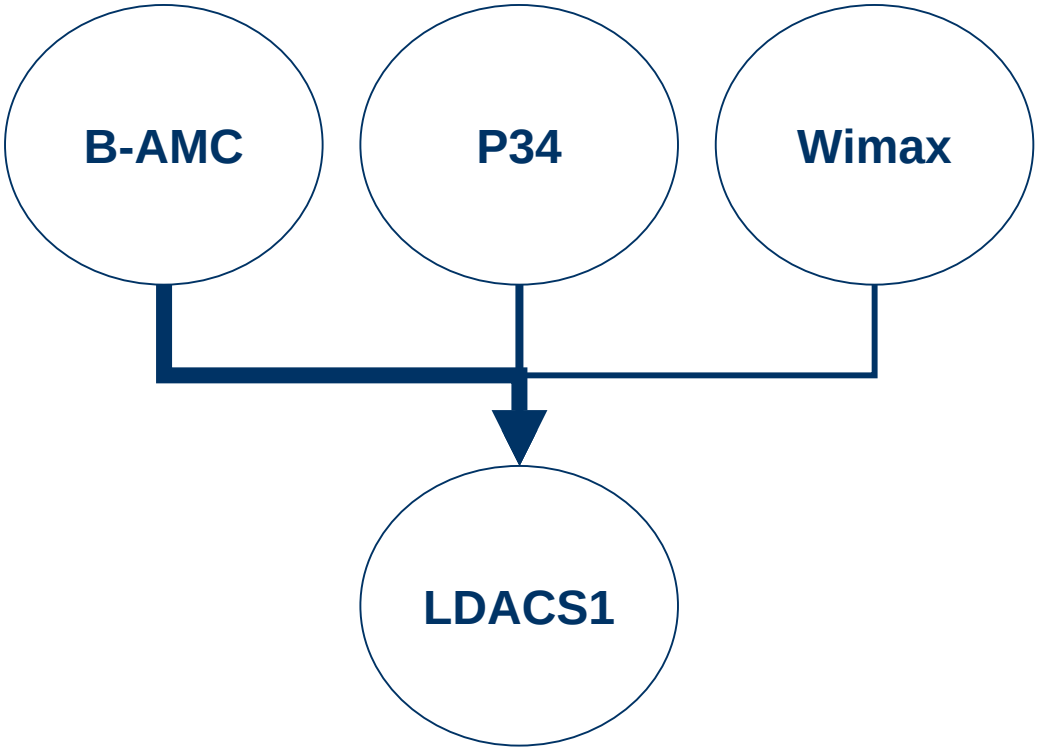
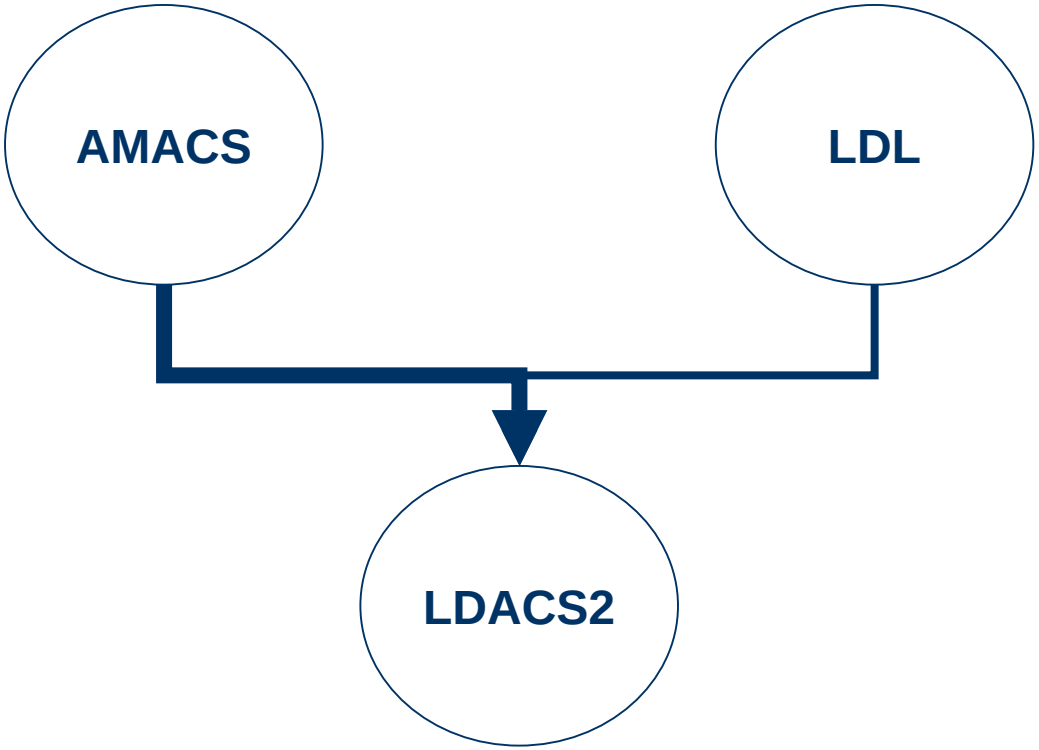
LDACS1 System



LDACS2 System

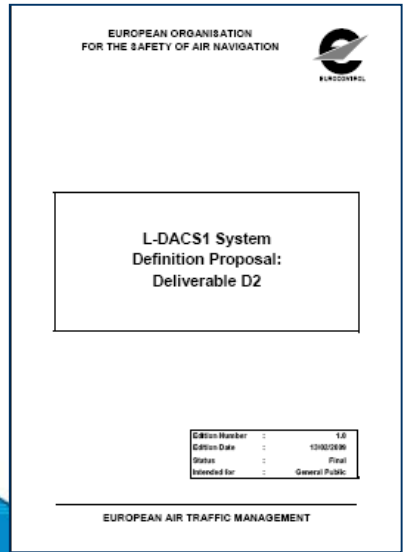


LDACS1/2 studies: Objective and deliverables

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 end of April 2009


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

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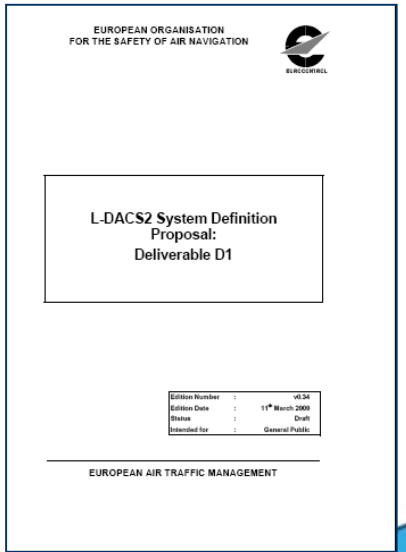
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FOR THE SAFETY OF AIR NAVIGATION

L-DACS2 System Definition
Proposal:
Deliverable D1

Edition Number	:	v0.34
Edition Date	:	11th March 2009
Status	:	Draft
Intended for	:	General Public

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LDACS1/2 studies: Separate presentations

- Key characteristics and Features

- LDACS1
  - D2 Deliverable
  - Draft D3 Deliverable

- LDACS2
  - D2 Deliverable

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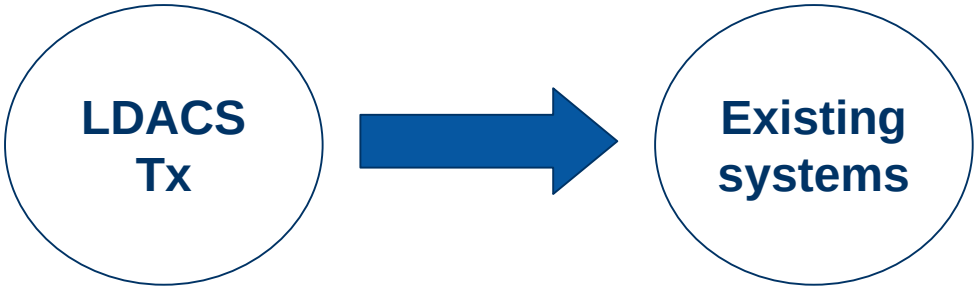
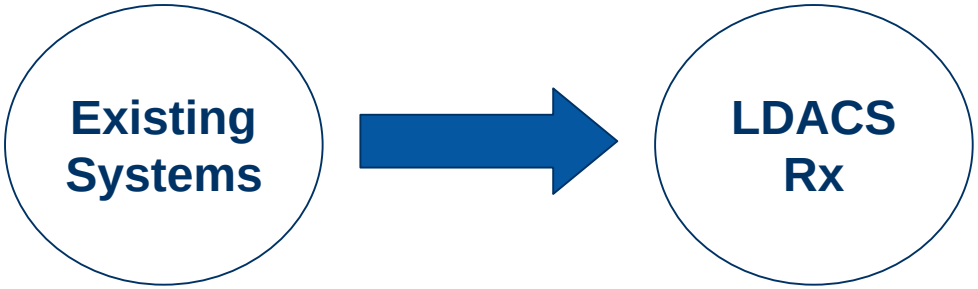
Criteria and Scenarios Study expected outcome

- Development of Spectrum Compatibility Criteria



- Development of Critical Interference Scenarios



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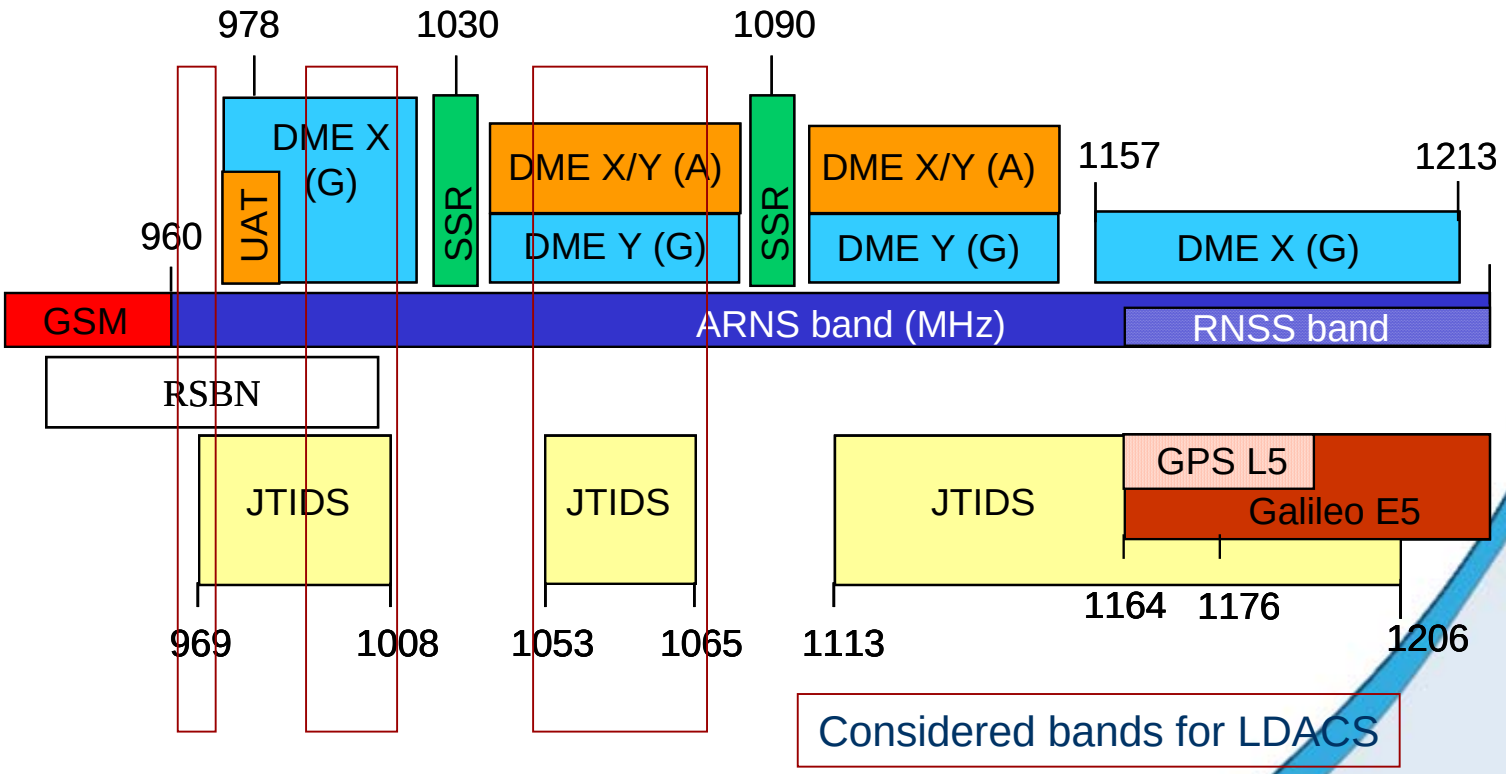
Compatibility Criteria

- 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

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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 April 2009

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Satellite Communications System

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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

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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

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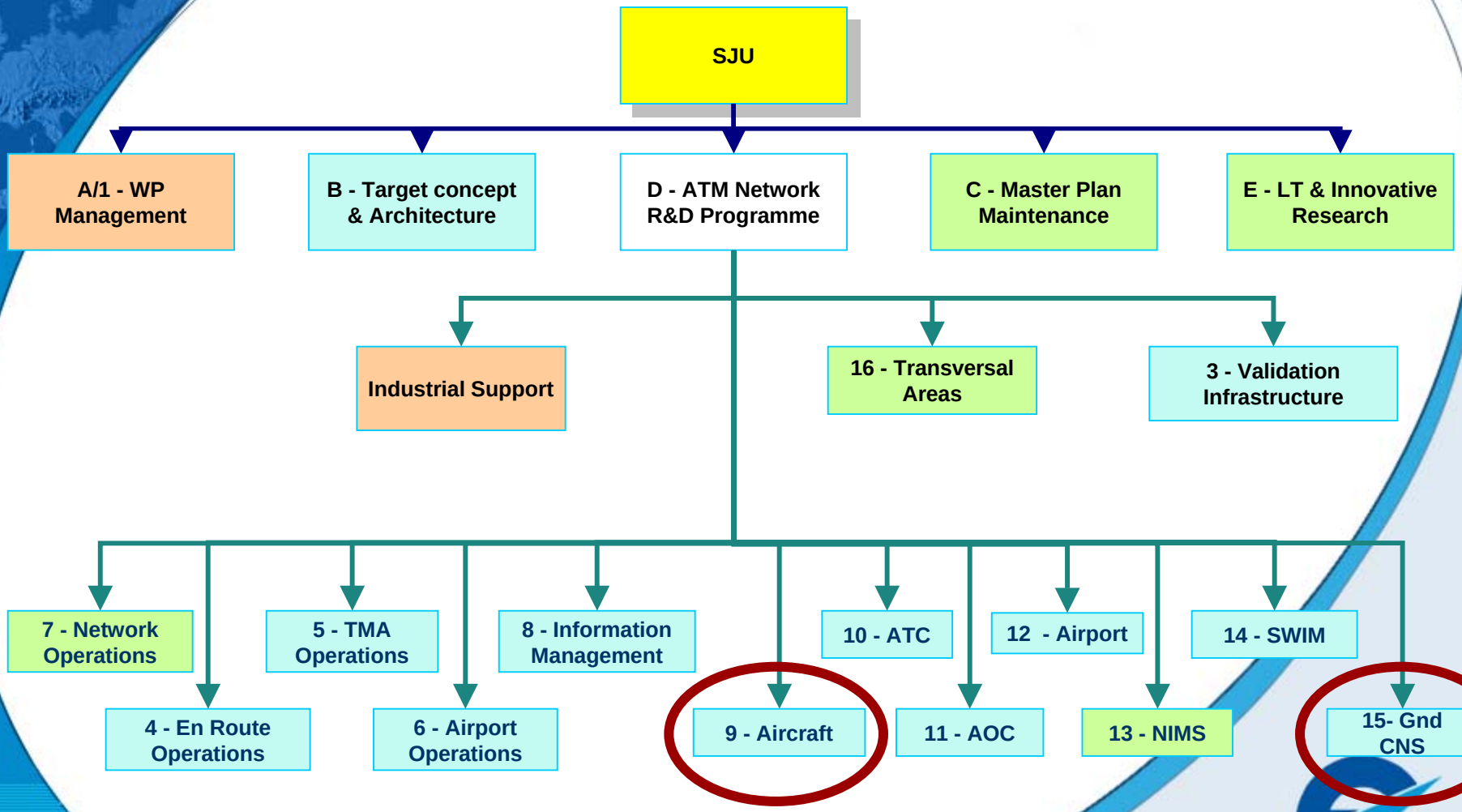
SJU WBS



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Communication Projects in SESAR (1/2)

WP9: Aircraft

- **Project 9.16: New Communication Technology at Airport**
- *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 9.44: Flexible Communication Avionics**

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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

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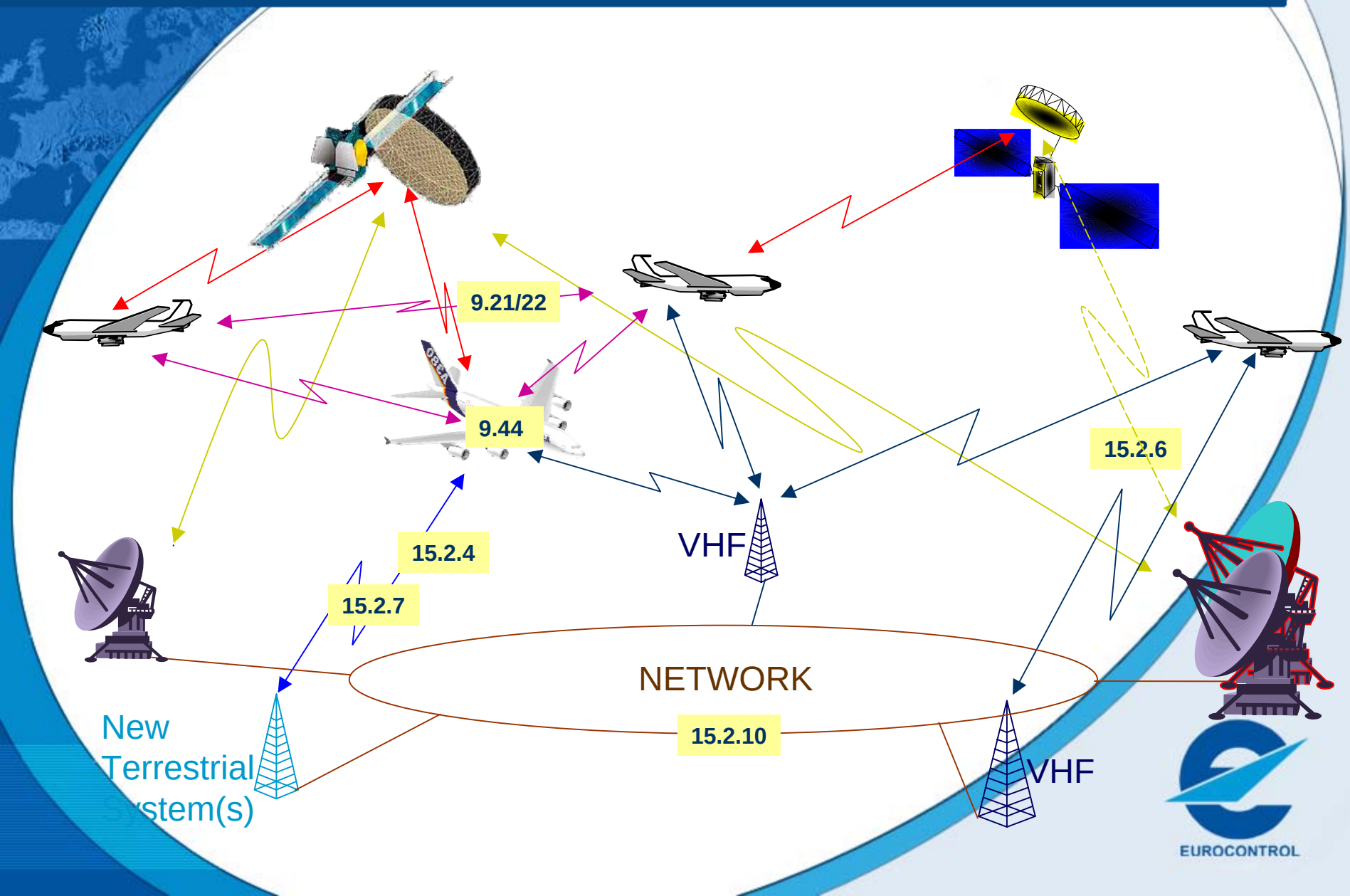
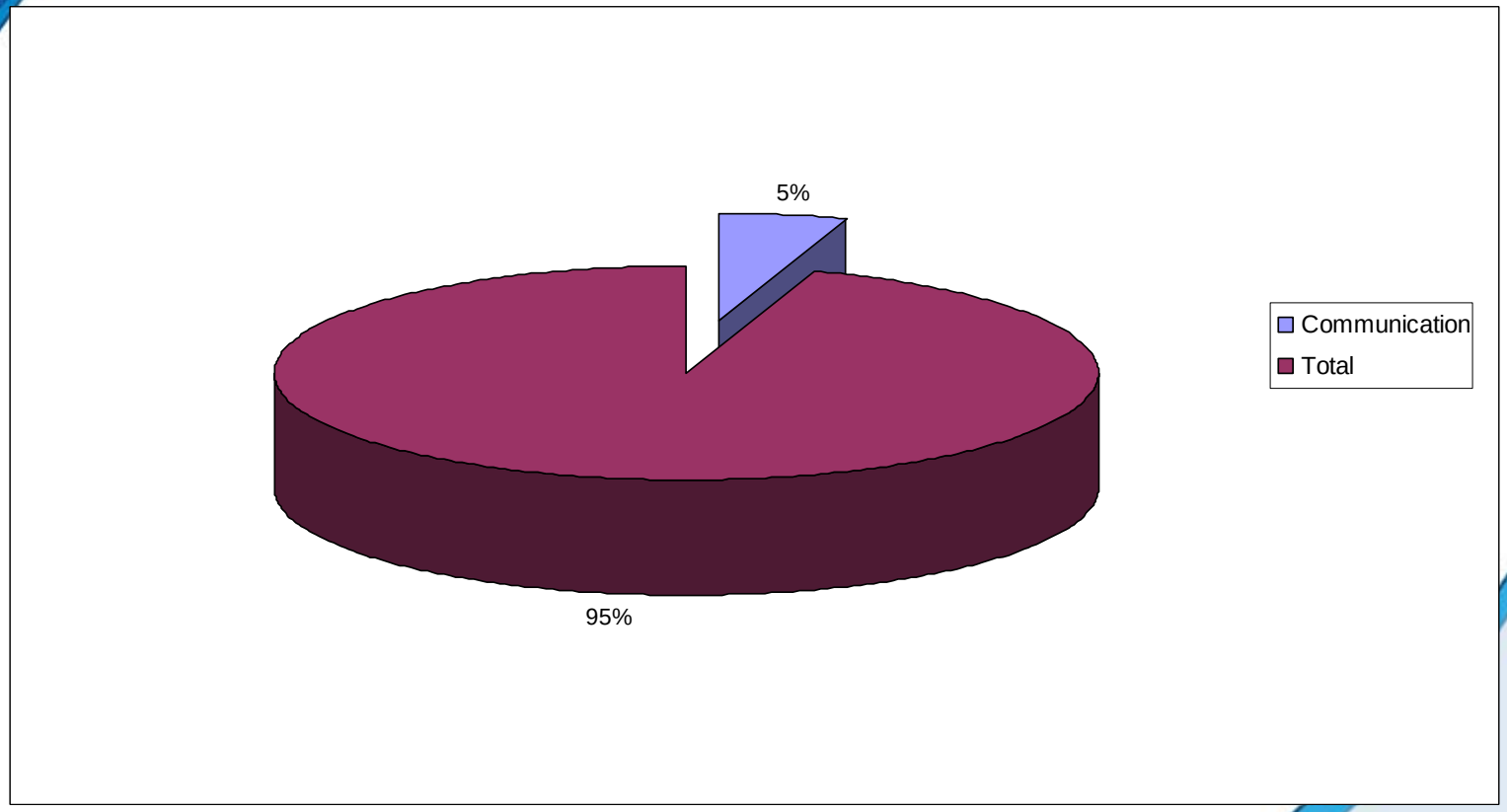
FCI: ATM Communications in 2020+`and SJU projects



Com Projects budget in SJU



Next Steps

What's Next:

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

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THANK YOU

Questions?

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Back Up Slides

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AP17 Results

L-DACS

United States	Common Technologies		Europe
Continental	•P34/TIA-902 •LDL •W-CDMA	•P34/TIA-902 •LDL •W-CDMA	Continental •B-AMC •AMACS •Custom Satellite
Oceanic/Remote	•Inmarsat SBB •Custom Satellite	•Inmarsat SBB •Custom Satellite	Oceanic/Remote
Airport	•IEEE 802-16e	•IEEE 802-16e	Airport

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L-DACS: L-band Digital Aeronautical Communication System

Key Characteristics

Options	Access scheme	Modulation type	Origins
L-DACS 1	FDD	OFDM	B-AMC, TIA 902 (P34)
L-DACS 2	TDD	CPFSK/GMSK type	LDL, AMACS

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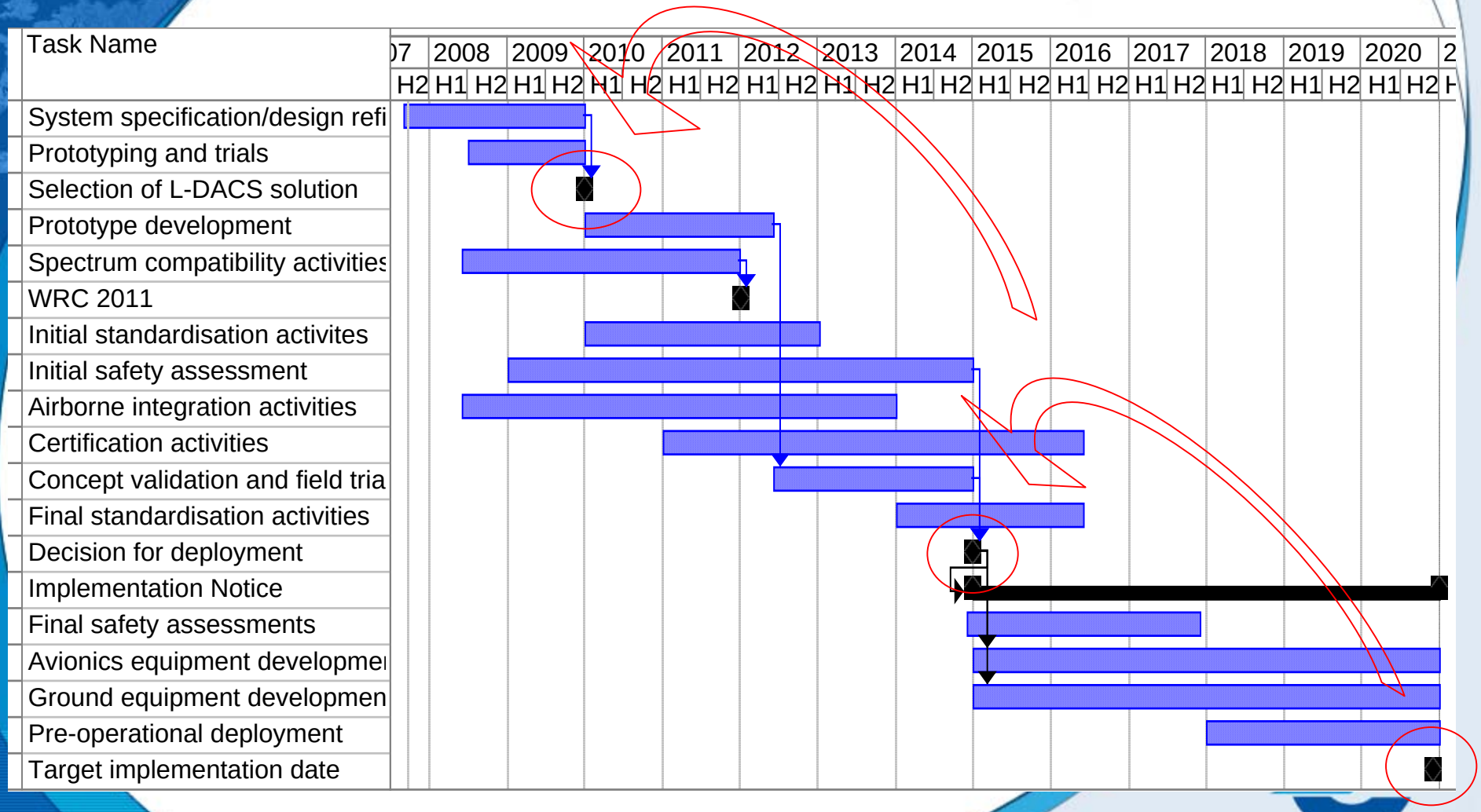
L band system: Development and Deployment Plan



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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

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