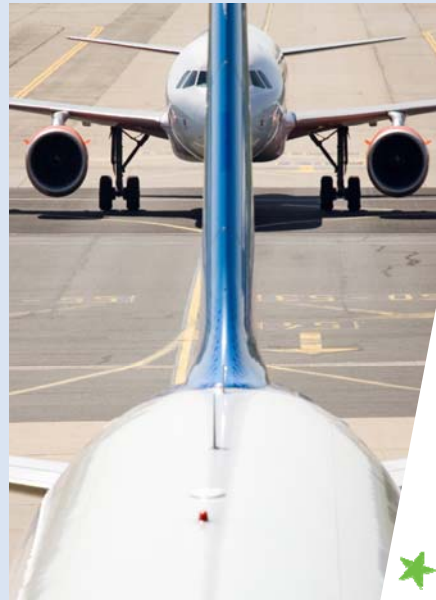




Agenda

- 14.05: Key note speech: Moving forward with SESAR** - Patrick KY, Executive Director, SJU
- 14.20: Single Sky II: A European commitment to innovation** - Daniel Calleja, Director Air Transport Directorate, European Commission
- 14.35: Air Traffic Management at the crossroads** - David McMillan, Director General, EUROCONTROL
- 14.50: Nine months after kick off: What have we achieved and learned so far?** Florian Guillermet, Chief Programme Officer, SJU
- 15.05: Roll out of the SESAR strategy** - Michael Standar, Chief Operational Concept and Validation, SJU
- 15.20: Coffee break**



Agenda

15.50: SESAR: A user-driven approach - Manfred Mohr, Head of project SESAR, Lufthansa,

16.05: SESAR: An opportunity for investment alignment - Mariluz De Mateo Garcia, Head of Strategy & Planning, AENA

16.20: Why ATM R&D is so critical? Patrick Schuster, Engineering Director Air Traffic Management, Airbus

16.35: SESAR and the human operators - Marc Baumgartner, President & CEO, IFATCA

16.50: Conclusions - Patrick Ky, Executive Director, SJU

17.15: End of conference



KEY NOTE SPEECH: Moving forward with SESAR

Patrick Ky, Executive Director, SJU

Amsterdam, March 9th, 2010

founding members





SINGLE SKY II: A European Commitment to innovation

Daniel Calleja, Director Air Transport
Directorate, European Commission

Amsterdam, March 9th, 2010

founding members



The European Organisation for the Safety of Air Navigation



ATM at the Crossroads



David McMillan
Director General EUROCONTROL

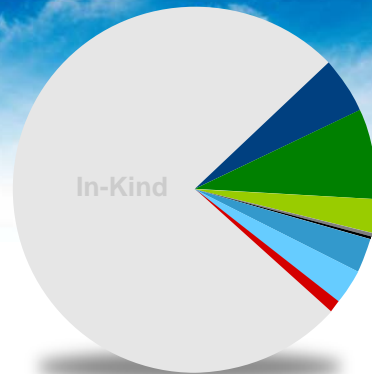


Border Crossing

“Looking across into the Future”

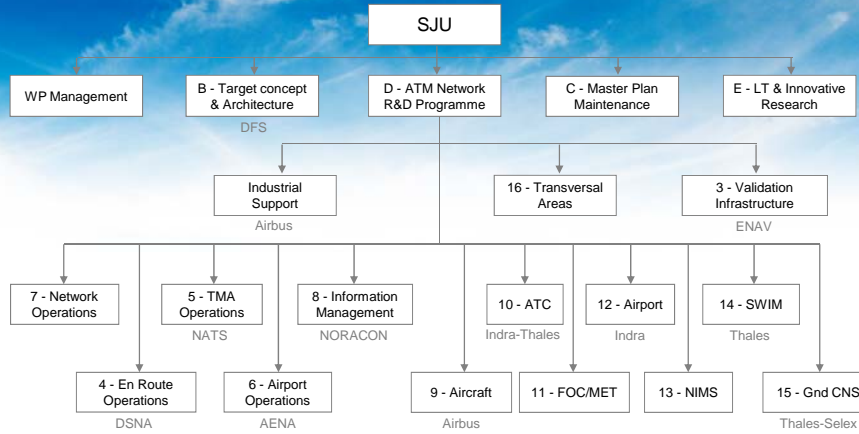


Breakdown of EUROCONTROL Contribution



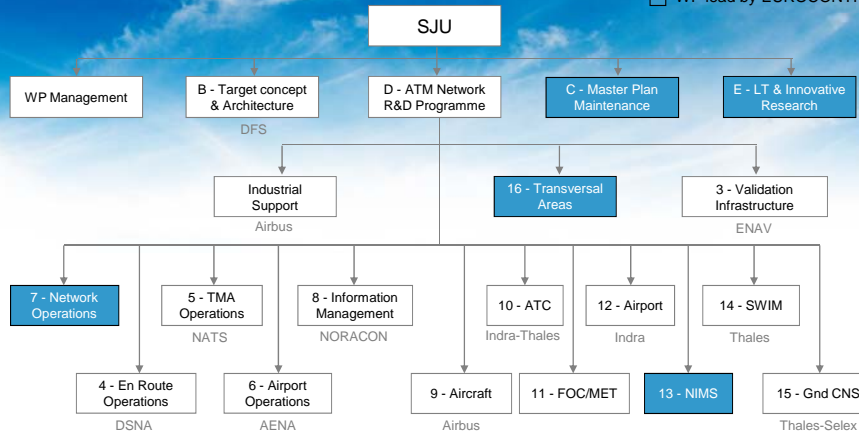
- “Cash”
- SJU running Costs
 - Co-financing of WP 7/13/16/C
 - Airspace Users
 - Staff Associations
 - Military
 - WP11
 - Co-financing of WPE
 - Early Projects

SJU Work Programme Work Packages led by EUROCONTROL

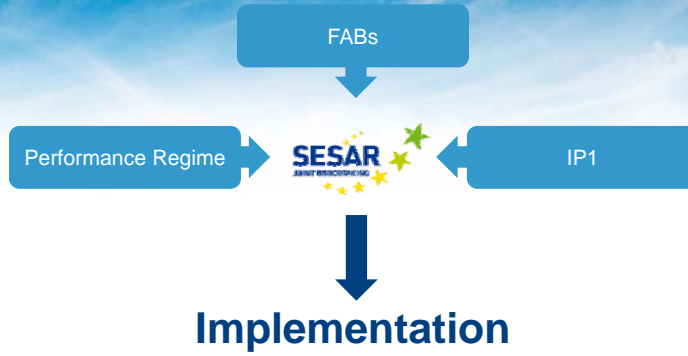


SJU Work Programme Work Packages led by EUROCONTROL

WP lead by EUROCONTROL



The Larger Role of EUROCONTROL



A Common Purpose
A Common Direction





Nine months after ...

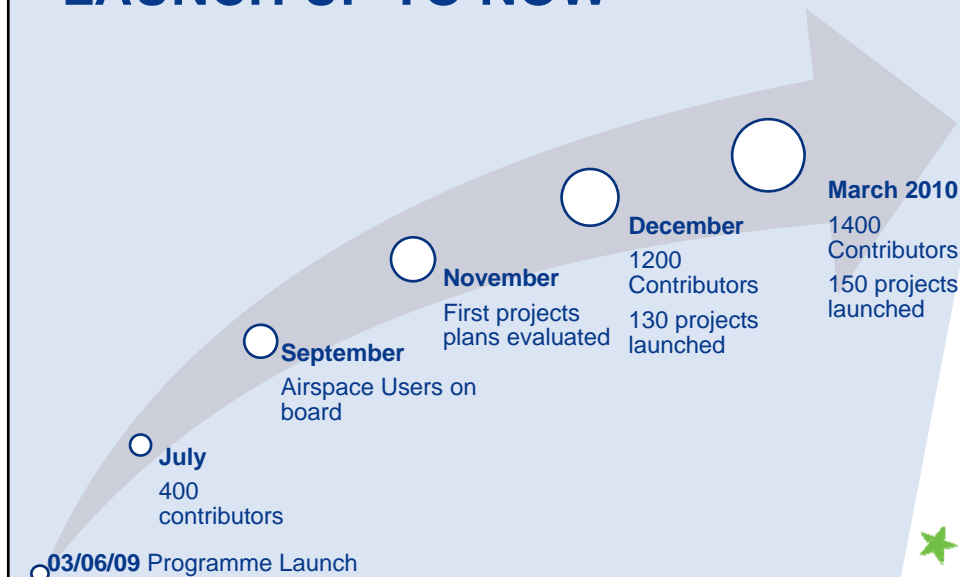
Florian Guillermet, Chief Programme Officer, SJU

Amsterdam, March 9th, 2010

founding members

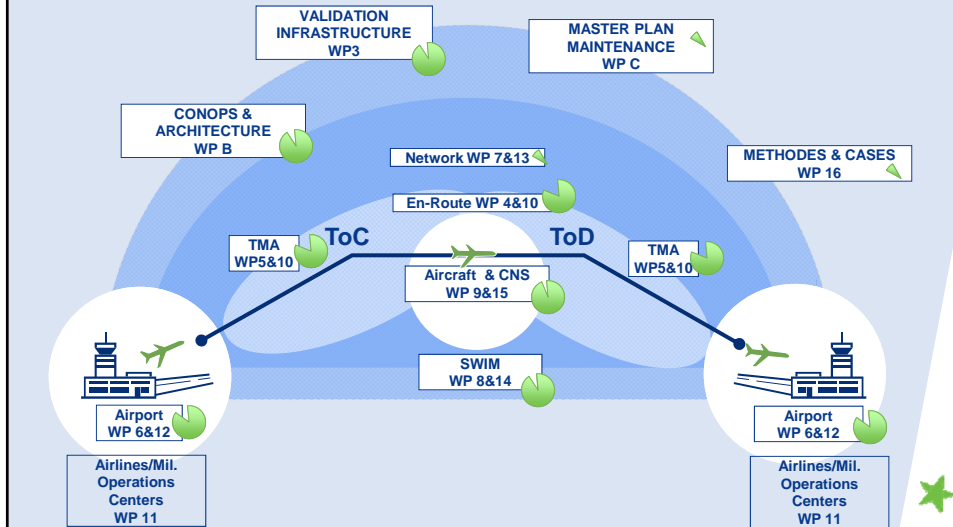


FROM THE PROGRAMME LAUNCH UP TO NOW



THE SESAR "FACTORY" IS IN PLACE

☐ 75% of the programme initiated



THE SESAR "FACTORY" IS IN PLACE

☐ 16 Members & about 70 companies on board

founding members



THE SESAR “FACTORY” IS IN PLACE

❑ **More than 300 projects**

❑ **Average project:**

- Duration 4 years
- Budget 7M€
- Dependencies with 5 other projects

❑ **Airspace Users directly involved in projects**

- Air France & Régional, KLM, Iberia,
- Lufthansa Group including SWISS and LCAG,
- SAS Scandinavian Airlines, TAP Portugal, Novair,
- A consortium coordinated by EBAA including Netjets Europe and Dassault Aviation, as well as IATA, and IAOPA

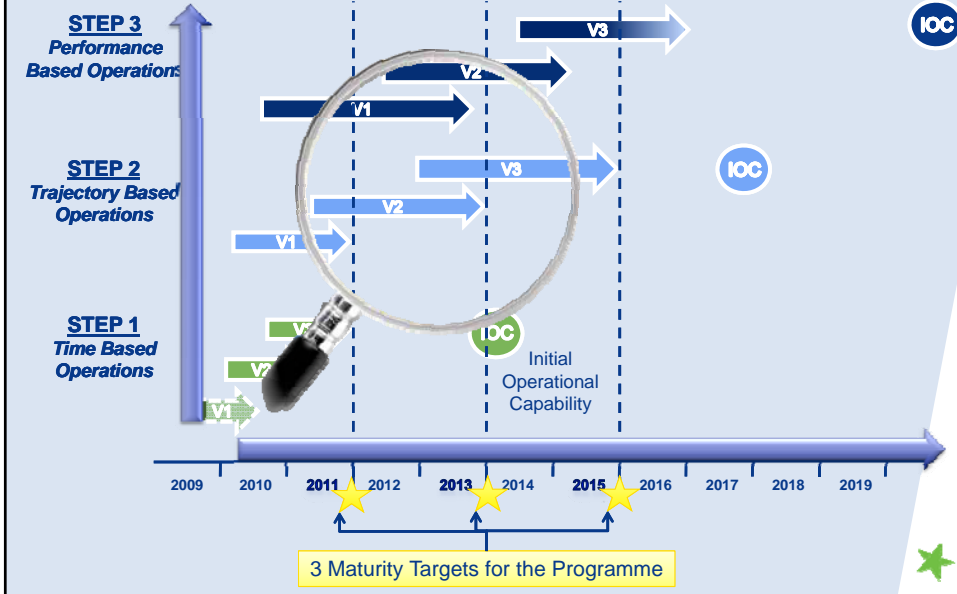


HOW WE WORK TOGETHER

HOW WE WORK TOGETHER



HOW WE WORK TOGETHER



HOW WE WORK TOGETHER

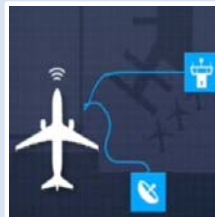


ON THE PRODUCTION LINE FOR 2010...



Information management

- Information models
- First software prototypes allowing data exchange AIM - Airport - Flight Data



Route Assignment & Guidance

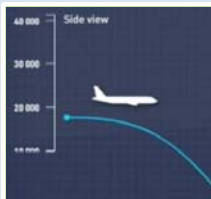
- Mock-ups / cockpit simulator for taxi clearance & data-link routing
- A-SMGSC routing & planning validations on 2 European Airports

ON THE PRODUCTION LINE FOR 2010...



Trajectory management – Airborne

- Operational scenarios
- Target performance Initial 4D



Fast Tracking of projects

- Advanced Approach Procedures with Vertical Guidance validation in Spain, Italy, Norway
- Atlantic Initiative to Reduce Emissions
- More than 1000 flights in 2010





Roll out of the SESAR strategy

Michael Standar, Chief Operational Concept and Validation, SJU

Amsterdam, March 9th, 2010

founding members



SESAR Strategies

- Operational
- System
- Validation and Verification
- Conclusions



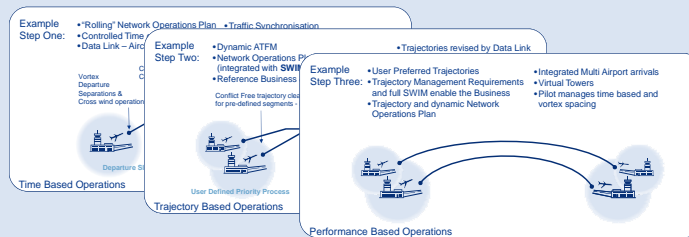
Concept 1 / 2

Designing to Performance

Operationally Enabling a Service Approach

Incremental Design - Story Board Steps

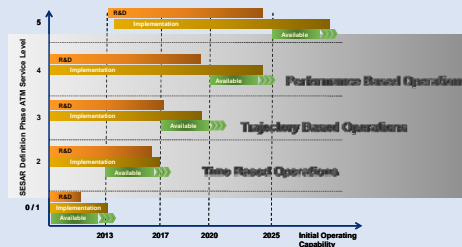
- Time Based Operations (Service level 2)
- Trajectory based Operations (Service Level 3)
- Performance Based Operations (Service Level 4)



Concept 2 / 2

SESAR Road Map

- Operational & Technical Performance Improvements in Value Added Packages – VAPs
- Deployment View – real examples rather than generic
- Supporting the Service Approach



Clear identification of dependencies

Clarity on ATM Partners transition path

No “one-size-fits- all”

System 1 / 3

Needs and Requirements:

- **Systems requirements driven by Service Approach and defined needs.**
- **Incremental view of necessary system changes based on each Story Board Step.**
- **SESAR Road Map approach**
 - Value Added Packages – VAPs
 - Integration of operational and technical.
 - Focused on readiness for deployment.



System 2 / 3

The Approach and Solution:

- **A Single European Architecture as the reference for system developments.**
- **Traceability from technical system developments to the delivery of tangible benefits.**
- **Interoperability achieved through performance and interface requirements.**
- **Standardisation where needed.**
- **Scalability and flexibility in the approach to meet local needs (complexity and specificity).**
- **Information is “key”**



System 3 / 3

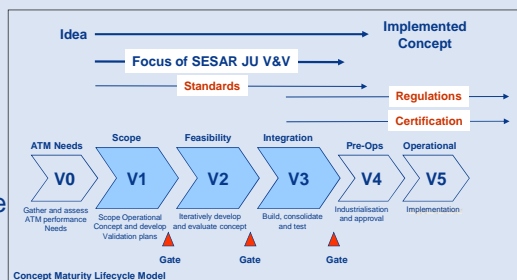
Programme and project responsibilities:

- Specific system projects build to requirements and verify developments
- Intelligent use of existing technology combined with new developments.
- Provision of prototypes must support validation through operational projects.
- Consolidation projects take system-level view to ensure consistency within the specific domain and support the technical architecture in WP B.



Validation & Verification 1 / 2

- Focus is on “*preparing SESAR products for implementation*” and identifying options for an early deployment.
- Achieve a level of operability and technical maturity to support industrialisation and deployment decision .
- Iterative prototyping-to-trials cycles focused on achievable goals with recognised performance benefit and implementation value.
- Operational shadow mode and live trials, bringing validation and verification as close to the target operational environment as possible.



Validation & Verification 2 / 2

Keys to Successful Validation and Verification:

- Partners commitment / partnership (Providers, Industry, Staff ..)
- Focus:
 - Time to Market
 - Target Operational Deployment Environment (Shadow/Live Trials)
 - Early Benefit (mature concepts, procedures and products)
- Consistent and integrated Validation and Verification
 - Focused incremental & structured approach;
 - Supported by Operational and System Threads
 - Designed and performed by Projects through an integrated approach
- Continuous Maturity Assessment linked to Control Gates



Summary

Performance Based

Incremental View - Story Board Steps

SESAR Road Map - Value Added Packages

Single European Architecture Reference

System Interoperability, Scalability, Flexibility

Built to requirements & verified

Maturity: iterative prototyping to trials cycles

Validation close to deployment

Working Together





SESAR: a user-driven approach
Amsterdam 09th March 2010



Manfred Mohr,
Head of project

   **bmi** A STAR ALLIANCE MEMBER   **Lufthansa**

Define the air space user "AU"

- Welcome on board:
- It is our common...
- Interest
- Environment
- World
- and Sky!



Manfred Mohr, FRA P/V/O-JS
*LAG= Lufthansa Aviation Group



A STAR ALLIANCE MEMBER



Lufthansa

Air space users "AU" are the "Drivers or Pilots"

- Who are the drivers...
- Only the Airlines... "AU"?
- Major and LCC or Charter
- Business...
- General aviation...
- Military...
- Cargo, freight...
- Passengers
- Tax payers
- We all = millions of European people = we all!

Manfred Mohr, FRA P/V/O-JS
*LAG= Lufthansa Aviation Group



A STAR ALLIANCE MEMBER



Lufthansa

Acceleration now to be ready for the future traffic demand!



“AU” and the Definition phase

- **The past:**
 - Air space users “AU” representatives like Iberia, Lufthansa and Air France-KLM have been global consortium members
 - but not always asked or consulted...
 - from industry and others...
 - only small or restricted Influence...
 - ATC no Air traffic management = ATM!

Manfred Mohr, FRA P/O-JS
*LAG= Lufthansa Aviation Group



A STAR ALLIANCE MEMBER



Lufthansa



“AU” and the ATM Master Plan

- **The current situation within SESAR...**
 - **Within the development phase we are working for and within:**
 - ATM Master plan update,
 - Cost benefit analyse,
 - 4D Trajectory...reference and shared business/mission,
 - Reviewing more than 250 projects in all work packages (WP)!
 - **We are supporting and preferring:**
 - Long-term Benefits but also Quick wins for our investments!
 - Software solutions versus Hardware changes!
 - Performance driven versus only technology driven solutions!

Manfred Mohr, FRA P/O-JS
*LAG= Lufthansa Aviation Group



A STAR ALLIANCE MEMBER



Lufthansa



“AU” and the Development phase

- **Airspace Users - AU (today)**
- published on 15th September 2009
- Major airlines, business & general aviation, associations on board of SESAR to modernise the European sky;
- Air France, KLM, Iberia, Lufthansa Group including SWISS and LCAG, SAS Scandinavian Airlines, TAP Portugal, Novair, a consortium coordinated by EBAA including Netjets Europe and Dassault Aviation, as well as IATA and IAOPA
- **SESAR Performance Partnership - SPP**
- Since 13th of January 2010
- AEA, EBAA, ELFAA, ERA, IACA, IAOPA and IATA,
- CANSO, ACI, MAB, IFATCA,
- Olaf Dlugi (chairman)

Manfred Mohr, FRA P/V/O-JS
*LAG= Lufthansa Aviation Group



SESAR Work-Packages with “AU” special interest

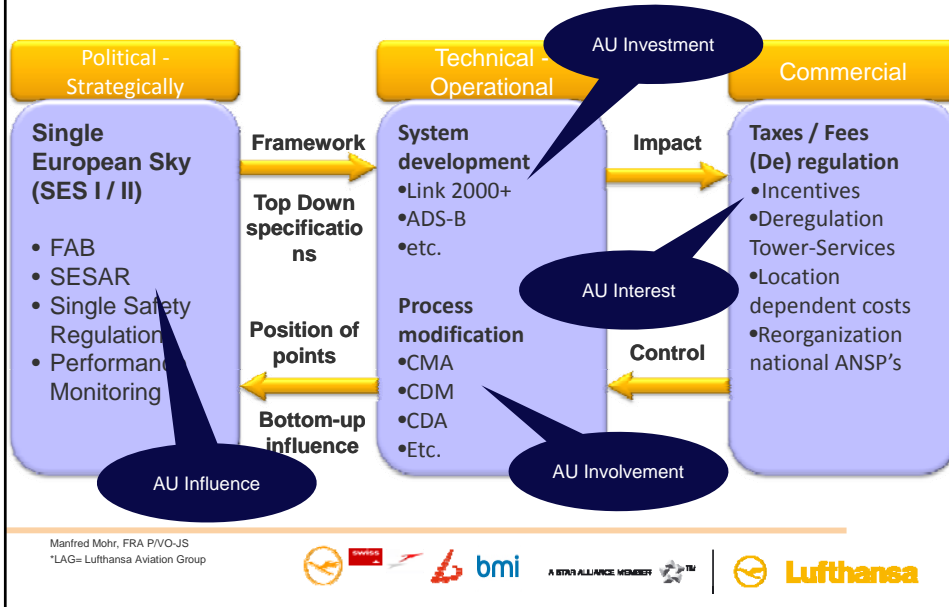
Some Examples:

- **WP3 Validation Infrastructure Adaptation and Integration**
- **WP9 Aircraft System**
 - 9.01 Airborne initial 4D trajectory management
 - 9.03 Interoperability of business trajectory and mission trajectory
 - 9.10 Approach with vertical guidance APV
 - 9.12 GBAS Cat II/III
 - 9.16 New communication technology at airport
 - 9.19 SWIM Air Ground Capability
 - 9.21 ADS-B – 1090 Higher performance study
 - 9.27 Multi-constellation GNSS airborne navigation systems
 - 9.28 Enhanced vision (Head down and head up) solutions
 - 9.29 Enhanced & synthetic vision
 - 9.31 Aeronautical databases
 - 9.33 ATS datalink Operational Improvements
 - 9.39 Continuous climbing cruise
- **WP11 Airlines Operations Centre System**
 - A/W/OCC and Meteorology
- **WP15 CNS System**
 - **15.00 Global co-ordination and management**
 - 15.01 Common CNS studies
 - 15.02 Communications
 - 15.03 Navigation
 - 15.04 Surveillance

Manfred Mohr, FRA P/V/O-JS
*LAG= Lufthansa Aviation Group



The ATM-Matters could split in three blocks – with addition to content and time



Manfred Mohr, FRA P/V/O-JS
*LAG= Lufthansa Aviation Group



Deployment phase for the “AU”

- The future... necessities
- ATM... more can be done
- faster, less delay
- greener – less CO2
- less time consuming, efficient
- effective
- pragmatic:
 - i.e. Software solution versus high-priced hardware changes
- NextGen (US) and SESAR (EU) solutions / technologies - must be developed in parallel and “synchronised / coherent”
- “Quick wins” should be realized
- But safety first in our “AU” business: Quality before Quantity

Best equipped aircraft – on time RTA = Incentives (bonus - system)!

Manfred Mohr, FRA P/V/O-JS
*LAG= Lufthansa Aviation Group



SESAR a user driven approach? - Yes, but still space for improvement!

Airspace Users "AU" Kick-Off Day

- "Europe and the airspace users are now ready for the SES!"



"SESAR" Together we all remain strong !

Manfred Mohr, FRA PVO-JS
*LAG= Lufthansa Aviation Group



A STAR ALLIANCE MEMBER



Lufthansa

Merci, Danke, Thank you !





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SESAR, an opportunity for investment alignment

Mariluz de Mateo
Head of Strategy and Planning
Air Navigation Directorate - AENA

Aena



ATC Global, Amsterdam
SESAR Forum
9th March 2010



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SESAR, an opportunity for investment alignment

OUTLINE

1. BACKGROUND

2. REQUIRED COORDINATED ACTIONS FOR INVESTMENT ALIGNMENT:

- DEPLOYMENT –IP1-
- RESEARCH & DEVELOPMENT –IP2-

3. CONCLUSIONS



BACKGROUND



SESAR: THE TECHNICAL SOLUTION

Single agreed goal: SESAR CONOPS 2020

Common vision of how the ATM System should work in 2020:

- **Operationally driven**
- **Designed to meet the targets set in the performance framework**

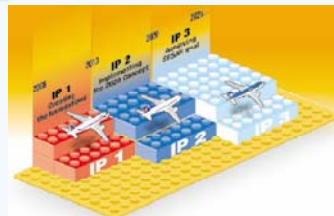
Environmental Impact -10%	Capacity x3
Unit Cost ATM /2	Operational safety x10

SESAR high level "political" targets 2020

Single reference transition roadmap

European ATM Master Plan agreed by institutions and ATM industry, ensuring:

- **Orderly transition from today to 2020**
- **Coherence between the deployment (IP1) and R&D (IP2-3) frameworks/actions**





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REQUIRED COORDINATED ACTIONS FOR INVESTMENT ALIGNMENT

- DEPLOYMENT –IP1-
- RESEARCH & DEVELOPMENT –IP2-



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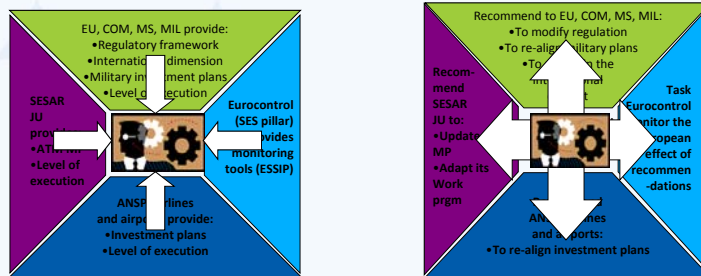
WHY?

- The ATM Master Plan is **not “binding”**
- The IP1 regulatory roadmap is **at its definition stage**
- The ATM Master Plan remains a **high level global framework** against which to develop **specific plans**: per stakeholder group & per geographical scope



EUROPEAN LEVEL

➤ **Political level:** IP1 Steering Group moderated by EC



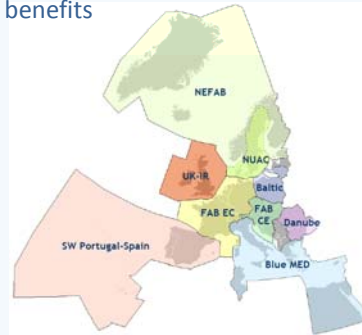
➤ **Strategical level:** Industrial Coordination Group (airspace users, airports and air navigation service providers)

➤ **Tactical level:** Implementation Support Group (Eurocontrol/SJU)

FAB

Synergies are explored in order to achieve early benefits

An example of alignment within a FAB
(FAB South West Portugal/Spain Planning Coordination TF)



On the basis of each company's individual medium and long term systems development and deployment plans, by:

- Identifying technical areas with converging objectives (operationally, technologically, geographically and time-wise)
- Prioritising the elements for the establishment of joint action



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IP1: REQUIRED COORDINATED ACTIONS (4 of 5)

INTER - ANSPs

Stakeholders groups share best practices and identify supporting technologies

An example of alignment within a stakeholder group (A6 IP1 Team / CANSO)

A6 (ANSPs that are members of the SJU) have agreed to work, collectively and in close coordination with CANSO, on IP1 matters:

- Agreeing on the contents of IP1 and their translation into Eurocontrol ESSIP objectives/SLOAs
- Determining costs & benefits, and prioritising the elements of the IP1 plan
- Contributing actively to IP1 deployment steering at European level (at both political and strategical levels)

MAIN OUTCOMES UP TO NOW

- Active contribution to **CANSO Policy Paper on SESAR IP1 Refinement (Nov 2009)**
- **Input for the first update of the ATM Master Plan** to be presented to the SJU Admin. Board at the end of **April 2010**



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IP1: REQUIRED COORDINATED ACTIONS (5 of 5)

An example of alignment within a company: COPRODE (Aena Air Navigation Committee for Strategic Projects Deployment Planning)

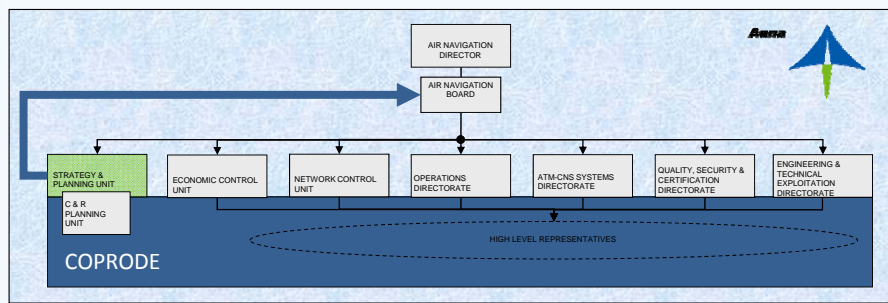
Mission:

To determine the company ATM/CNS-AUT/INF systems deployment strategic projects ensuring their alignment with the SES/SESAR initiatives.

Product:

Aena Air Navigation Business Plan Vol. II: "Strategic projects for the evolution of the Spanish ANS (2010-2014)"

Membership (High Level Representatives from all key Aena's AN Directorates)





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IP2: REQUIRED COORDINATED ACTIONS (1 of 1)



R&D –IP2-: SJU



- The SJU has established a **commonly shared European ATM R&D work programme**
- The SJU **rationalizes the use of scarce R&D resources**
- **Synergies** are created among all participating companies
- R&D products are **focused on operational performance improvements**
- **Time to market** of R&D products is **accelerated**
- **Guidance for future investment** planning is provided



Aena



AIRBUS



AleniaAeronautica
A Finmeccanica Company



DFS Deutsche Flugsicherung



dgac
D G A C



ENAV S.p.A.
ITALIAN COMPANY FOR AIR NAVIGATION SERVICES

FREQUENTIS

Honeywell



indra

NATMIG

NATS



noracon



SEAC

SELEX
Consortium

THALES



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SESAR, an opportunity for investment alignment

CONCLUSIONS



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CONCLUSIONS

SESAR FOSTERS ALIGNMENT AT ALL LEVELS

Single agreed goal: SESAR CONOPS 2020



Single reference transition roadmap: European ATM Master Plan



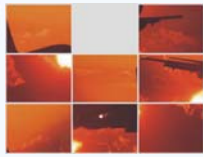
COORDINATED



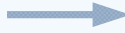
ACTIONS



STAKEHOLDER PLANS



SHAPE IN OR SHIP OUT



Work in isolation is **NOT** an alternative
Cost of opportunity: The sooner action is
taken, the earlier will the benefits be
reaped!



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SESAR, an opportunity for investment alignment



THANKS FOR YOUR ATTENTION!

Presented by

SCHUSTER Patrick
Head of Air Traffic Management
& Multi-Programme Project Engineering



ATC GLOBAL

Why is ATM R&D so critical?



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Why is ATM R&D so critical?

- 2 industries serving the same customer

• No contractual relation

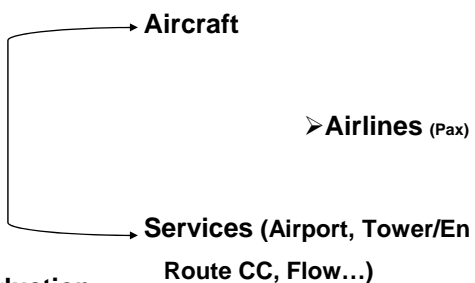
- The 'paradigm' changes

'Single' technology introduction:

→ From idea to implementation: long time/very costly

Beyond technology, much more issues to be dealt with

'paradigm' changes



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*It is key to orderly prepare
the future European Air Traffic Management System*



Why is ATM R&D so critical?

AIRBUS in ATM

- ▶ ATM is a key (and today limiting) factor to the growth of air transport
 - 1% growth in Europe = 50 a/c sales (Airbus + Boeing)
 - Airlines profitability (reducing ATM inefficiencies and cost)
 - Growing environmental pressure
 - Significant Impact on CNS avionics of all fleets linked to future ATM

- ▶ Secure investment
 - Convince all decision makers including our customers
 - Complexity
 - Understand, Reduce, Optimise



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Why is ATM R&D so critical?

Secure investment:

Agree the common baseline level (service, performance, standards)

- ▶ Continue the reinforcement of exchanges between all stakeholders
 - Collaboration of all aviation actors
 - International cooperation

- ▶ Implement the performance-based approach
 - Based on clear understanding of the
 - Needs – operations, constraints...
 - Required capabilities (especially the airborne ones when best fits)

 - Quantified and measurable figures

 - Published standards



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Why is ATM R&D so critical? airline

Secure investment:

Establish confidence: Proof / Proof / Proof!



- It is key to ensure as expected by airlines that
 - › Master Plan objectives are met, and,
 - › Target performance can be achieved with measurable metrics
- Therefore, key is validation involving test aircraft or revenue aircraft
 - › Initial proof of concept:
 - Quick wins and/or confirmation of the potential of the new procedures
 - › Initial operational V&V activities involving coupling of ground and aircraft simulators or systems
 - › ‘Large scale’ validation
 - Overall Infrastructure (air to ground)
 - Safety and Human Factors actors buy-in

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Why is ATM R&D so critical?

Secure investment: First investments are made by aircraft industry!
We need more than just ‘trust’ !

- Ensure the main stakeholders will proceed:
 - › Master plan confidence
 - › Secure the institutional framework
 - IP1 as a first step
 - › Ensure financial matters
 - Infrastructure costs
 - ROI
 - › Project management
 - The System of Systems approach:
 - starting with the first SESAR main steps
 - ensuring overall consistency
 - Align/Synchronise the roadmaps



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SESAR and the Human Operator

9.3.2010

Amsterdam

Marc Baumgartner



ifatca

International Federation of Air Traffic Controllers' Associations



Warning

Unless controllers (and service providers):

- Speak loudly about the beneficial role of air traffic control
- Use terminology that is understood by the powerful lobby groups such as airlines
- Make significant changes to more strategic and interoperable control practices

the existing role of air traffic control in air traffic management will be phased out!

ifatca

International Federation of Air Traffic Controllers' Associations



Why

- Future ATM is now (being designed)
- ICAO Global Concept is being interpreted by those outside of ATC – especially “users”
- Organizations that phased out the flight engineer, introduced fly-by-wire, etc now have massive government funding to redefine ATM
- Airlines are doing what Service Providers should have been doing

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Human & Technology

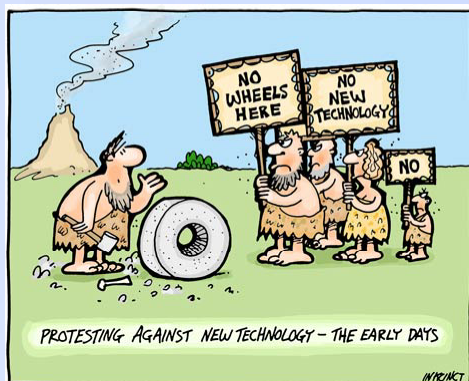


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Influencing factors New Technology

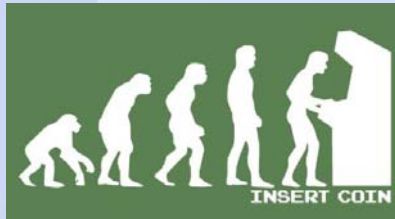


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Evolving role of humans



Service Provision



Job evolution

ifatca

International Federation of Air Traffic Controllers' Associations

Automation Human centered



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Strong point of humans



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International Federation of Air Traffic Controllers' Associations

Risks

- Current system is understaffed
 - (+15% for transition phase)
- Involvement of human operators is crucial
 - Challenge for validation (ANSP)
 - High risk for SESAR
- Final result of SESAR is not what is required in OPS room, due to a strong industrial influence

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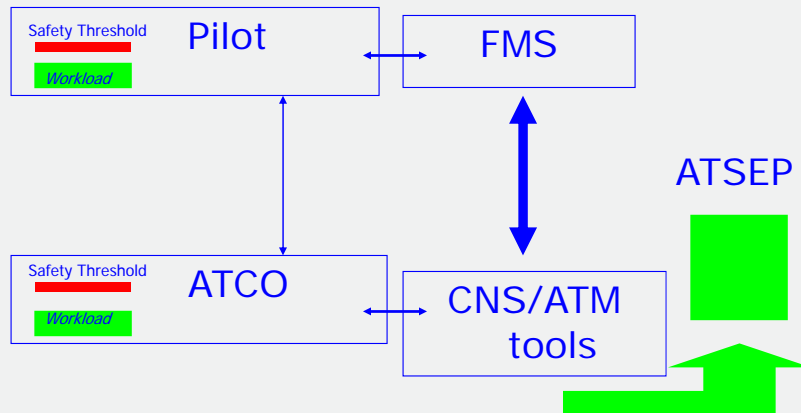
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- Balancing the workload balances the the safety chain.
 - Harmonizing the performance criteria for the ATSEP.
 - Greater interaction between players, CDM.

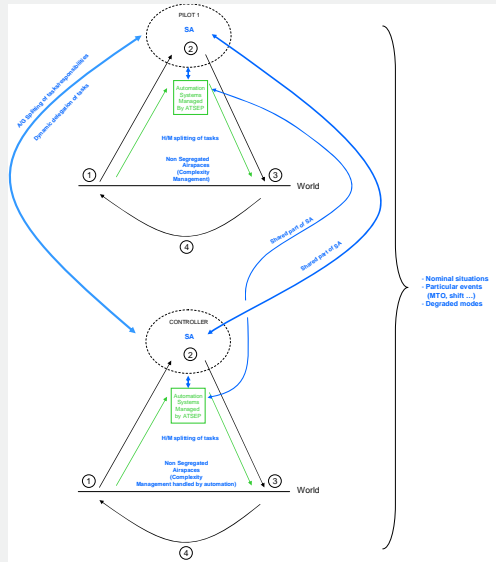


Balancing responsibilities / workload





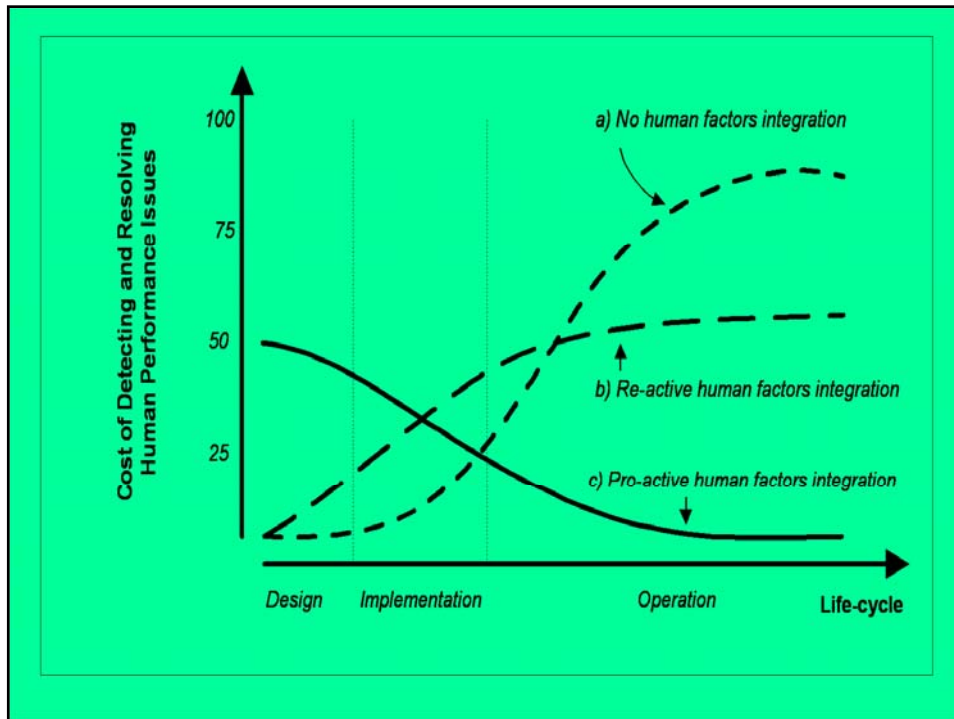
ATSEP role in a balanced safety chain

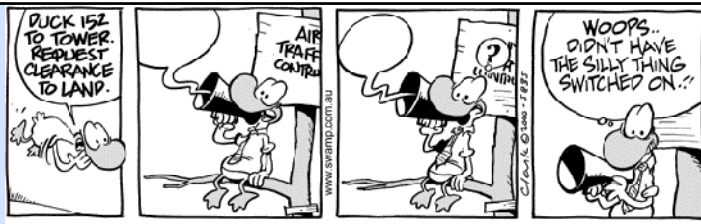


ETF congress
11/07/2007
C. Viegas

slide nr 79/9

University of Southampton





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SESAR
JOINT UNDERTAKING

CONCLUSIONS

Patrick KY – Executive Director
Amsterdam March 8th 2010

founding members



