



SESAR
JOINT UNDERTAKING

THE FUTURE OF AIR TRAFFIC MANAGEMENT – SAFE & EFFICIENT

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ICAS Nice - 23 September 2010

founding members



SETTING THE SCENE.....



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EUROPEAN ATM CHALLENGES

Capacity:
Doubling of Air Traffic by 2030

Safety:
Improvements linked to growth

Environment:
Sustainable operations

Operations:
Seamless & Harmonised

Cost:
Affordable by customers

Technology:
Common and Interoperable

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THE REGULATION

SJU is responsible for "... carrying out specific activities aimed at modernising the European air traffic management system by coordinating and concentrating all relevant research and development efforts in the Community" - Council Reg 219/2007



European-funded ATM research and development is consolidated into SESAR....

Success means coordinating with other relevant research and development efforts too.

SESAR WILL substantially change the Air Traffic Management (ATM) market in Europe..... and beyond?

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THE SESAR JOINT UNDERTAKING (SJU)

A European Union Community Body

		
EUROPEAN COMMISSION	EUROCONTROL	THE INDUSTRY = public-private partnership
700 mio€	700 mio€	700 mio€
2 founding members		3 rd 'founding' member

Budget: €2.1 billion (over 8 years)

Public-Private Partnership

- Innovation from the private sector
- Financial stability & enforcement power from the public sector

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SJU INVOLVES ALL ACTORS

A Multi-Stakeholders approach at the heart of our way of working





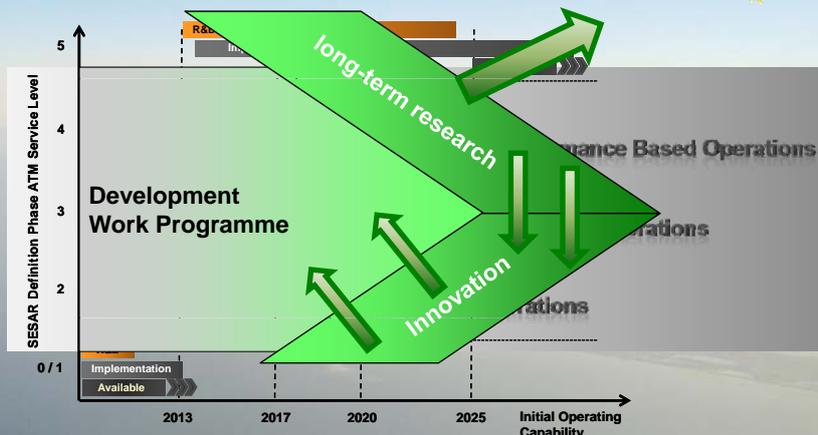


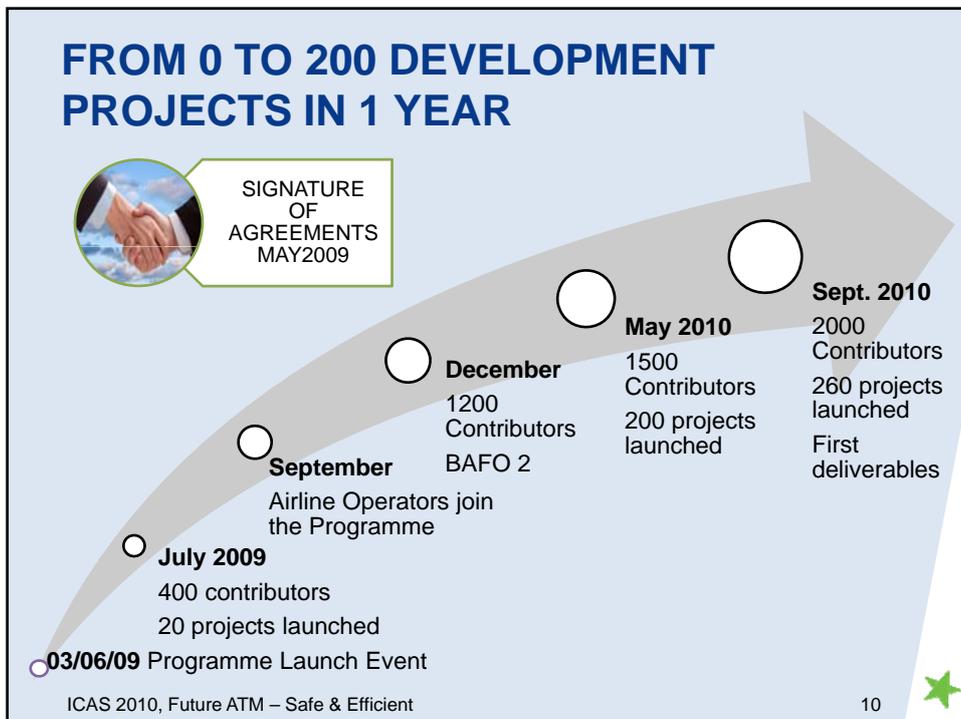
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INTERNATIONAL COOPERATION

- **Air transport is a ‘business’ on a global scale**
 - Many of the same operations, performance and technology issues already occur, or will shortly occur outside of the European Single Skies area. For example look at NextGen in the US.
- **Modernisation is therefore a world-wide issue**
 - While regional problems need to be solved, account also needs to be taken of the global impact.
- **Today’s Regional problems become tomorrows global issues and must be solved only once**
 - SESAR Joint Undertaking is committed to looking for solutions under Single European Skies that are suitable for use outside of Europe.
 - Under a formal Memorandum of Cooperation between the EU and the US we are working together to deliver SESAR and NextGen interoperability in a safe, efficient and cost-effective manner.

DEVELOPMENT vs. RESEARCH AND INNOVATION





WORKING TOGETHER

SESAR is not running 300 independent projects

For the Project

deliver tangible contributions to solutions (technology, procedures...), on time, on budget, and in line with end users expectations

For the Programme

enable ATM performance in line with performance requirements

Each project has to comply to an Engineering Methodology and is developed through maturity stages toward pre-industrialisation



PIECES OF SESAR DEVELOPMENT

Development Threads:

- 4-D Trajectory Management
- Information Management
- Collaborative Network Planning
- Enhanced Automation Support

Integrating across:

- Airborne
- En-Route
- Terminal
- Airports
- Airline Operations
- Military Operations
- CNS Infrastructure (Inc. Space)





4-D TRAJECTORY MANAGEMENT

- **Position & Time - all phases of flight, all stakeholders**
- **The set of trajectories delivering preferred routes and timings, taking account of all constraints**
- **Predictable Civil Airline Operations & Military Mission Planning**
- **All phases of operation**
 - Ground - Airport Gate, taxi for departure
 - Airborne - Climb, Cruise, Descent, Arrival
 - Ground – Airport Taxi to gate
- **Depends on a predictable Airport Turnaround process**

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THE SYSTEM WIDE INFORMATION MANAGEMENT

The Intranet for Air Traffic Management

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INFORMATION MANAGEMENT

- Information is at the heart of ATM
- Develop the concept of ‘System-Wide Information Management’
- Moving ATM from System-Centric to Information-Centric operations
- Establish the ‘intranet’ for aviation
- Access to accurate information at the right time, to the right systems and to the best people in support of taking the right decisions

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High Performance Teamwork

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COLLABORATIVE NETWORK PLANNING

- “Collaborative policy processes are increasingly in use as ways of achieving results in an era distinguished by rapid change, social and political fragmentation, rapid high volume information flow, global interdependence, and conflicting values.”

Network power in collaborative planning - Booher & Innes

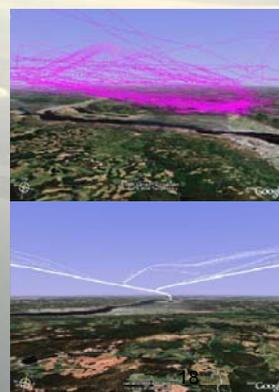
- **A managed network**

Integration of airports and airborne systems in the ATM system

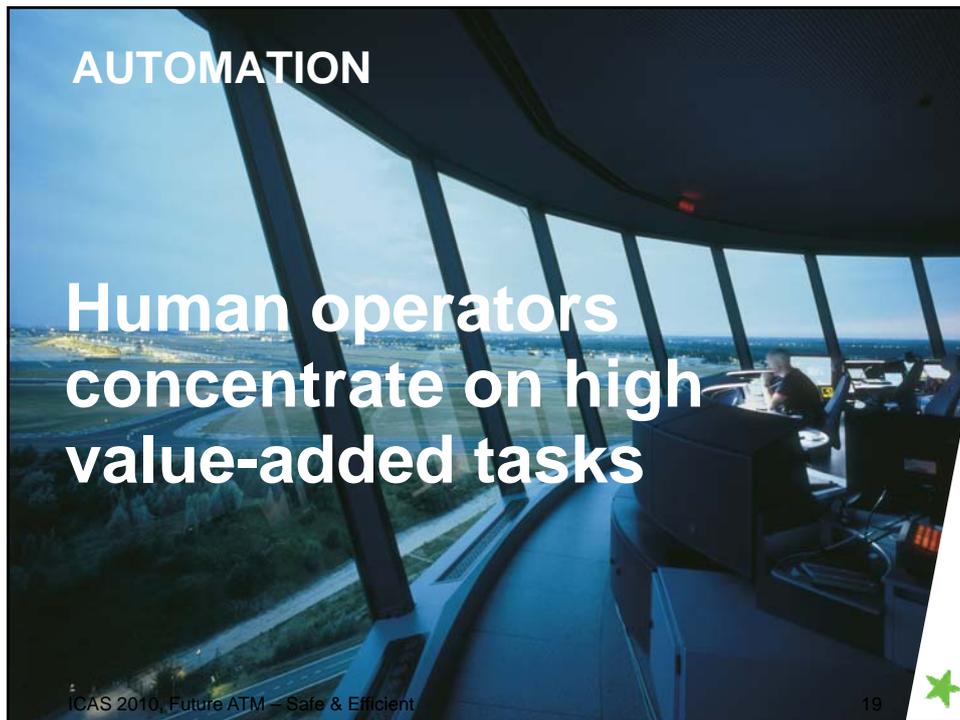
Collaborative planning of network operations and demand/capacity balancing continuously reflected in the Network Operations Plan (NOP)

“User Driven Prioritisation Process” allowing Airspace Users to trade between themselves and attribute delay allocation

Network Manager as the mediator



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ENHANCED AUTOMATION SUPPORT

- **SESAR maintains the human as central in the system, taking decisions and managing the operations**
- **In order to meet the challenges ahead the human needs even greater levels of automation support**
- **Advanced computer tools provide decision-making support and therefore a fundamental dependence on information relevance and timeliness – Human Factors aspects are significant**
- **The failure modes and recovery consequences for both safety and business continuity must be clearly understood**
- **Security considerations will become increasingly significant as systems use more commercial and open protocols and as interoperability improves**

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SESAR RESEARCH PHASE WHERE ARE WE NOW?



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INVOLVMENT OF THE R&D COMMUNITY

• Long Term Research

- Academia & Research Establishments forming networks of excellence, support to PhD students and active on projects that go beyond the SESAR 2020 scope

• Scientific Committee

- 12 European scientific personalities; including an astronaut, professors & researchers

• Provide advice to the SJU on:

- Scientific analysis of SESAR from different angles
- Liaison between SESAR and the academic and scientific communities across Europe including education of the future “SESAR” engineers & scientists
- Scientific value of the SESAR results



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SUCCESS LOOKS LIKE ..



• By 2012 we will have created:

- A Healthy body of research spread across a wide range of research organisations.
- A repository of knowledge providing material for extending SESAR development beyond current timescales and scope.
- A strong focus on innovation providing a healthy challenge to the status-quo in air transport.
- Tangible results and a reputation for air transport research that attracts more students, research and investment.
- The reputation for leading European results oriented research and innovation that is the envy of others.



EXPECTATIONS

Support long term health and global leadership in the European ATM and air transport industry

- Invest in the development of sustainable ATM research capabilities
- Promote ATM and air transport as a serious and challenging topic for study
- Encourage graduates to seek careers in the discipline

Stimulate creativity by funding new research

Coordinate related research to reduce fragmentation and exploit areas of excellence

Contribute to the broader goals of knowledge, innovation and research



LONG TERM & INNOVATIVE RESEARCH

- **Includes Universities, Research Organisations and Industry**
- **Applying ideas from across many domains into ATM**
 - Automation
 - Complexity
 - Economics
- **Sponsoring of Research Projects**
 - Covering automation, complexity, economics and legal topics
- **Sponsoring of PhD Students**
- **Providing a mechanism for Networking and exchange of ideas and results across all ATM research activities**
- **Objective is to foster Innovation and achieve results ready for development**



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ESTABLISHING RESEARCH NETWORKS

- **Groupings of organisations - Academia, Industry, Research Establishments**
- **Sharing common interest and expertise in a particular field of research**
- **Each will co-operate to develop, exchange and disseminate knowledge in its particular field**
- **Capabilities that have lasting and widespread impact on ATM and air transport research across Europe**
- **Specific activities will include:**
 - Knowledge development (including scientific education, PhD studies)
 - Knowledge management
 - Animation of the network (workshops, exchange)
 - Organisation/engagement in events (conferences, seminars, symposia, ...)



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ESTABLISHING RESEARCH PROJECTS

- WP-E projects are co-funded activities that fall outside the scope of mainstream SJU workpackages.
- Periodic calls for proposal will be prepared in accordance with a Thematic Programme, and advised by the Scientific Committee.
- Proposals will be solicited from both within and outside the networks. They will be evaluated by an independent panel of experts.
- Results will be expected to contribute to the relevant Research Network(s).

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PIECES OF SESAR RESEARCH

Research Themes:

- Mastering Complex Systems Safely**
- Towards Higher Level of Automation in ATM**
- Economics and Performance**
- Legal Aspects of Paradigm Shift**

Focussing on:

- Business Agility
- Decision Support
- Environment & Meteorology
- CNS/ATM (Automation)
- Operating Concepts
- Human Factors



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STATUS TODAY



- **Two Research Networks Launched**
Mastering Complex Systems Safely
Towards Higher Level of Automation in ATM
- **A Call for one more Research Network**
Economics & Performance (Closes 26th October)
- **First Call for Research Projects**
Closes 26th October



**SESAR
DEVELOPMENT
SESAR LONG TERM
& INNOVATIVE
RESEARCH
SAFE, EFFICIENT &
MAKING A
DIFFERENCE!**

