European Commission
Directorate General for Energy and Transport

MEMO

November 2005

# The SESAR programme: Making air travel safer, cheaper and more efficient

**The Single European Sky industrial and technological programme**

Air Traffic Management aims to ensure safety and efficiency of flight operations, on the ground and in the air.

Today, air transport faces major challenges. Affordability, efficiency, safety, environmental friendliness and technical modernisation are central to air travel development.

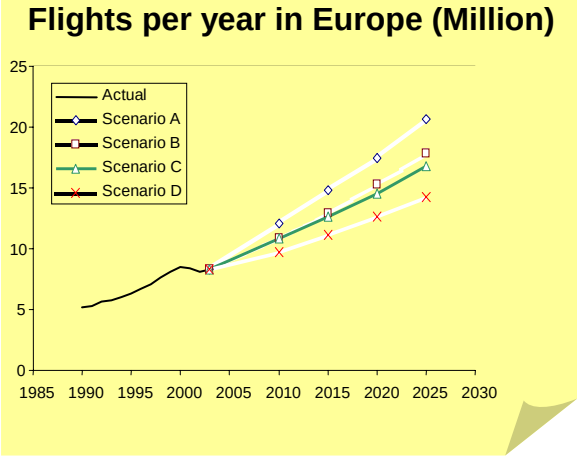
If European Air Traffic Management is to meet these challenges, a technological leap forward is needed. European industry needs to stay in the forefront of technological development.

The EU SESAR programme aims to provide the answer, by developing a new generation of Air Traffic Management systems, which can in turn serve as a model for the world.

# Air Traffic Management infrastructure urgently needs modernisation. SESAR is the European response.

The aviation sector contributes €220 billion to European gross domestic product and employs 3.1 million people. Air transport also helps to build European cohesion, ensuring the rapid and efficient movement of people and goods, but also providing essential access to remote regions.

Air traffic in Europe is projected to grow substantially in the next 20 years. In some regions, traffic is expected to double or even triple in volume. Experience has shown that increases in the cost of the European air traffic control system (currently about €7 billion per year) are generally in proportion to the increase in traffic. Using the current model, air traffic management could cost between €14 and €18 billion per year in 2020. This is not sustainable, notably for the airlines.




Safety is also a concern. The EU has taken a number of steps to continuously improve safety further, notably by establishing the European Aviation Safety Agency (EASA), based in Cologne. Although flying is one of the safest travel mode, within the last five years, three major aviation accidents in Europe have been directly linked to air traffic management problems: a collision following runway incursion in Paris Roissy on 25th May 2000 and at Milan Linate on 8th October 2001, and mid air collision over Überlingen on 1st July 2002. As traffic increases, and as existing technical systems reach the limits of their capacity, the risk of accidents grows. In this field, like for security, a zero tolerance should be achieved.

All forces should be pulled together. The uncoordinated development of separate national technical systems risks duplication of effort, significant additional cost, and unnecessary delays in the introduction of new equipment. As a result, users suffer in terms of cost and performance, and air traffic controllers are obliged to use sub-optimal systems.

A major contribution to EU economic growth and technological development is already being made by such major industrial projects as GALILEO, the satellite radionavigation programme. Based on this philosophy, the **EU SESAR programme aims to develop the next generation European ATM system.** The challenge is to develop technologies, methods of organisation and industrial components which can ensure the safety and fluidity of air transport in the next 20 years, not only in Europe, but worldwide.

## Why SESAR?

The SESAR programme aims to answer three challenges:

### ○ *Technological challenge*

Technologies in current use are reaching their limits.

At present, the Air Traffic Management infrastructure is unable to make full use of recent technology in fields like telecommunications or satellite navigation.

This technological time-lag limits the overall flexibility of the ATM system, in particular by obliging aircraft to follow rigid trajectories between fixed points. This approach is far from optimal in terms of time, congestion, fuel consumption and noise.

### ○ *Commercial challenge*

Air transport is a global market. In a highly competitive sector, European industry needs to stay on the forefront.

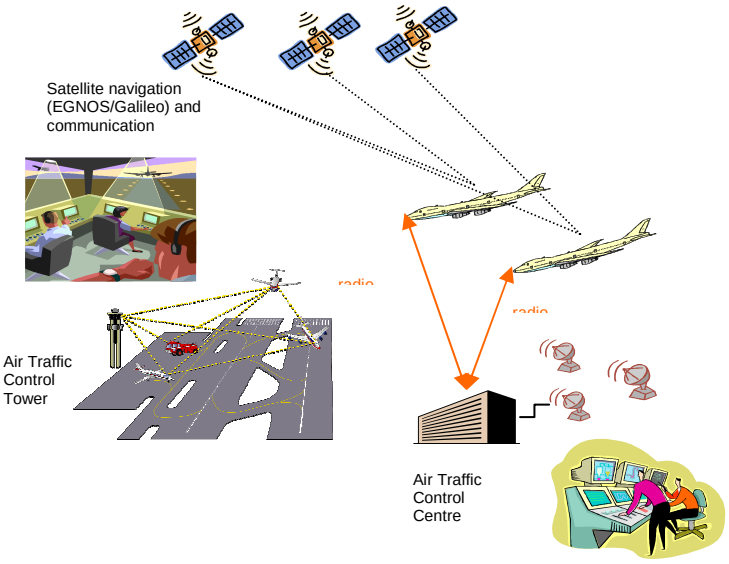
### ○ *Political challenge*

Air Traffic Management aims to ensure safe, secure, and efficient flows of traffic, with a minimum impact on the environment. The expected growth in air traffic, with increased complexity and density, create new challenges. A technological breakthrough in Air Traffic Management infrastructure is needed.

For the European "Single Sky" to become reality, the European technical and organisational infrastructure needs to evolve, enabling airspace integration into Functional Airspace Blocks (FABs).

The sky has no limits. The SESAR programme aims at facilitating the integration of Air Traffic Management systems for the benefit of users worldwide.

# The Single European Sky




The primary objective of Air Traffic Management is air traffic safety. For a non-expert, the sky may seem empty. For the ATM expert, the situation is different. Traffic routes, especially to and from major airports, are overcrowded, and face the same problems as motorways on land.

The EU has undertaken to remedy this situation by the "Single Sky" initiative, establishing a new institutional and organisational framework for Air Traffic Management in Europe. Major elements are:

- The separation of regulatory activities from service provision, and the possibility of cross-border Air Traffic Management services.
- Reorganising European airspace into “Functional Airspace Blocks” (FABs), defined in line with operational traffic flows, and no longer constrained by national borders.
- An essential role for the European Commission in setting common rules and standards, covering a wide range of issues, such as flight data exchanges and telecommunications.

The Single Sky has also an industrial and technological dimension: the basic technology used by Air Traffic Management dates from the 1970s, and in certain aspects, from as far back as the 1950s. Ground-based Air Traffic Controllers give instructions to pilots in the air using VHF radio. Air Traffic Management decision-making is largely unautomated, with the result that Air Traffic Controllers have to carry a heavy burden, in mentally anticipating all traffic patterns.

**Following the success of GALILEO, the EU introduces SESAR as its second major high-tech industrial programme.**

**SESAR:**

- aims to **treble the capacity** of the European Air Traffic Management system
- will **improve safety** of air transport operations by a factor of ten
- is expected to **reduce** environmental impact by 10%.
- will contribute €**50 Billion** to European **economic growth**.
- will generate **200 000 highly qualified jobs** in Europe.

The **SESAR definition phase**, running from 2005 to 2007, costs **€60 million** and involves the **creative efforts of forty companies.**

# SESAR: By 2020-2025, Europe will have the most modern, efficient and safe Air Traffic Management infrastructure in the world.

The SESAR programme consists of two phases:

- The **definition phase** (2005-2007) has been designed and co-funded by the European Commission and by Eurocontrol, the European organisation for air navigation safety. This two-year intensive project will define a **European Air Traffic Management Master Plan**, consisting of:
  - Detailed requirements for performance and operation
  - A technology roadmap, with target dates for development and introduction of specific systems
  - A proposed system architecture
  - A detailed funding and implementation plan

- The **implementation phase** will be organised in two steps:
  - The development step (2008-2013) will develop the technologies on which the new generation of systems will be based. This phase will also target major functional enhancements, in areas such as evolution of automated support tools and task-sharing between ground and aircraft.
  - The implementation step (2014-2020) will see the large scale entry into service of the new systems, and the application of their enhanced functional capacities. The resulting new Air Traffic Management system will treble current capacity, increase safety by at least a factor of ten, and will have an operating cost far below that of today.

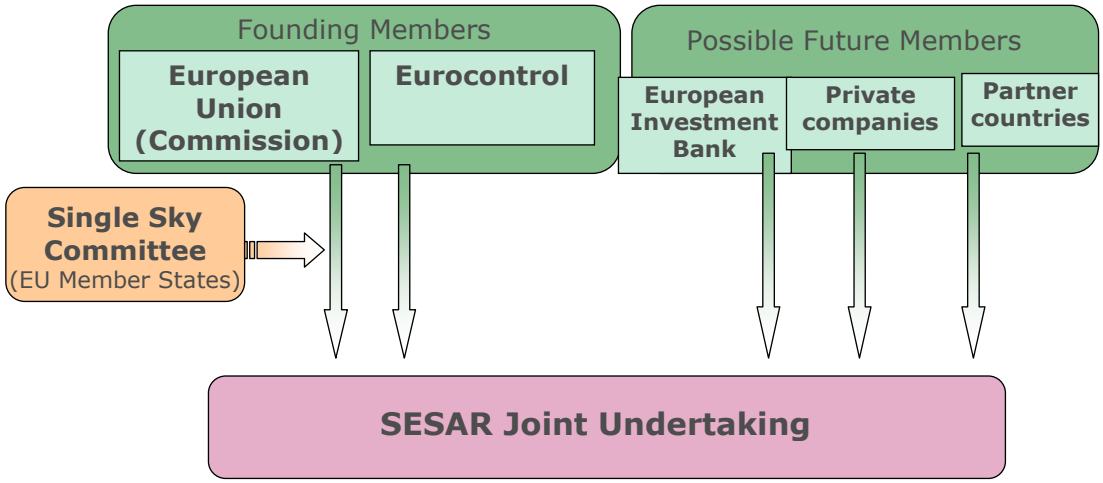
**Some examples of technological progress expected from SESAR:**

- High capacity digital and voice telecommunications between ground and aircraft.
- Advanced traffic flow management systems
- Automated decision support tools for air traffic controllers
- Advanced and secure telecommunications network
- Advanced automated systems for optimised landings and take-offs, and airports movements
- Wake turbulence detection systems
- Aircraft-based air traffic management in low density areas
- Active satellite navigation (EGNOS/GALILEO) for all flight phases (take-off/cruise/landing)

## SESAR actors

The definition phase work will require an unprecedented effort by the whole aviation community, based on a a team of approximately 200 persons, and involving airspace users (carriers), air navigation service providers, airports, military, professional associations, manufacturing industry and Eurocontrol, working full time for two years..

For the development phase, a new structure - the **SESAR Joint Undertaking** - will be established, combining the efforts of the wide range of participants in the definition phase, and with the institutional and financial support of European public authorities.




The SESAR Joint Undertaking will be a public-private legal entity, combining the long-term investment horizon of public authorities with the technological innovation of industry. It will be in charge of the implementation of SESAR, based on definition phase results.

Membership in the SESAR Joint Undertaking will also be open to Partner States.

**The SESAR indicative funding scheme is the following:**

| Phase | Years | Funding | Stakeholders |
|---|---|---|---|
| **Definition** | 2005-2007 | **€60 million:**<br>Eurocontrol (€30 million)<br>European Union (€30 million ) | Eurocontrol |
| **Development** | 2008-2013 | **€300 million per year:**<br>European Union (€100 million )<br>Eurocontrol (€100 million )<br>Industry and Partner States (€100 million) | Joint Undertaking |
| **Deployment** | 2014-2020 | **Industry** | Industry |

(The figures, except for the first phase, are indicative and will be refined in the definition phase)

## SESAR and the world

Air transport is international by nature. In terms of Air Traffic Management infrastructure, global interoperability is needed, for economic and technical reasons, but above all for reasons of safety.

SESAR is a worldwide project:

- Cooperation agreements will be sought with third countries, in order to synchronise SESAR technological and operational choices with other modernisation initiatives.
- Partner States will be invited to become members of the SESAR Joint Undertaking, to contribute to the technological programme, as well as other potential Single Sky activities

SESAR is expected to make a major input into the work of ICAO and to be supported by the European standardisation organisations (CEN/CENELEC/ETSI, EUROCAE).

**MEMO** is prepared by the Strategy, coordination, information and communication unit, DG Energy and Transport.

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