

SESAR

JOINT UNDERTAKING

A collection of stylized stars in yellow and green, arranged in a semi-circular pattern around the text.

founding members





PRESENTATION

Patrick Ky – Executive Director

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WHY SESAR?



EUROPEAN CHALLENGES:

Capacity:

Air Traffic to double by 2030

Safety:

Improvements linked to growth

Environment:

Growth must be 'green'

Economics:

Incentives & liberalisation

Operations:

Eliminate fragmentation

Technology:

All above & interoperability



EUROPEAN CHALLENGES:

A new Air Traffic Management System is required:



For the benefit of all air space users:
airlines, business & general aviation,
airports, air navigation service
providers, military, passengers &
citizens



SESAR IS ORGANISED IN THREE PHASES:

Definition phase

Resulted in the **European ATM Master Plan**

Development phase

Managed by the **SESAR Joint Undertaking**

Based on the Master Plan, results in **Standards, new operational procedures, new technologies and pre-industrial components,**

Deployment phase

Implements the results of the development phase, delivers **the performance increase** foreseen in the ATM Master Plan

2006-2008

2008-2014

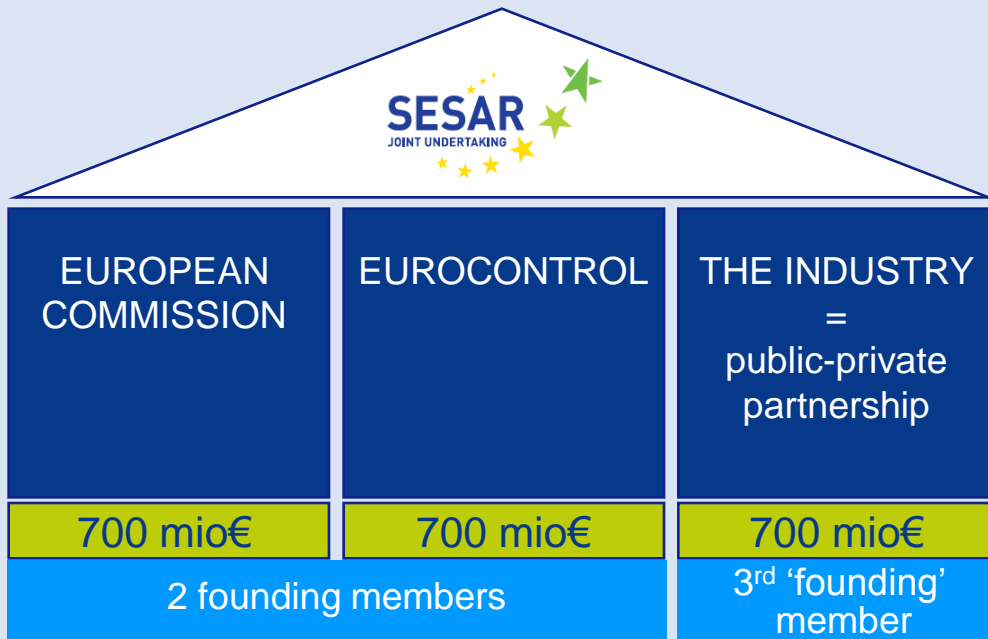
2015-2025



WHAT IS SESAR ?



WHAT IS SESAR JOINT UNDERTAKING?



**Created by the
European Union Council
Reg. N°219/2007**

Budget: € 2.1 billion

Public-Private Partnership: a première

- Innovation from private sector
- Public financial stability & enforcement power



THE 4 GOALS OF SESAR

Enabling EU skies
to handle **3 times
more traffic**

Improving safety
by a factor of 10

**Reducing
the environmental
impact**
per flight by 10%

**Cutting ATM
costs by 50%**



ONLY WAY FORWARD:

A Public-Private partnership



PUBLIC-PRIVATE PARTNERSHIP



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STAKEHOLDER ENGAGEMENT



f.i. Administration Board representation

- Each member of the Joint Undertaking
- Military for Service Provision & Airspace User
- Civil users of airspace
- Air Navigation Service Providers
- Equipment manufacturers
- Airports
- Staff representative bodies for the ATM sector
- Relevant scientific institutions or the relevant scientific community



STAKEHOLDERS BEYOND EUROPE

International Co-operation

Air transport is a 'business' on a global scale.

Modernisation is therefore a world-wide issue.

Today's Regional problems become tomorrows global issues and must be solved only once.

SESAR JU is working with FAA NextGen and other countries to align activities on interoperability



SESAR & ENVIRONMENT



MINIMIZE THE ENVIRONMENTAL IMPACT OF AIR TRAFFIC

- 10% per flight

Minimize NOx

Minimize Noise

Respect local constraints

> To be implemented at European scale



**CHANGE
IS IN THE AIR**



Concept of Operations

Civ/Mil ATM Performance Partnership

Integration of Air- and Ground-systems

Integration of Airport "turn-around" operations

**Time and performance based operations /
4 D B/M Trajectories**

The ATM intranet of clients using SWIM

Rolling Network Operations Plan

Automation support to the Human

Efficient separation modes



THE 4D TRAJECTORY PRINCIPLE

**Building railway
precision in the sky**



THE SYSTEM WIDE INFORMATION MANAGEMENT

The Intranet for Air Traffic Management



AUTOMATION

**Human operators
concentrate on high
value-added tasks**

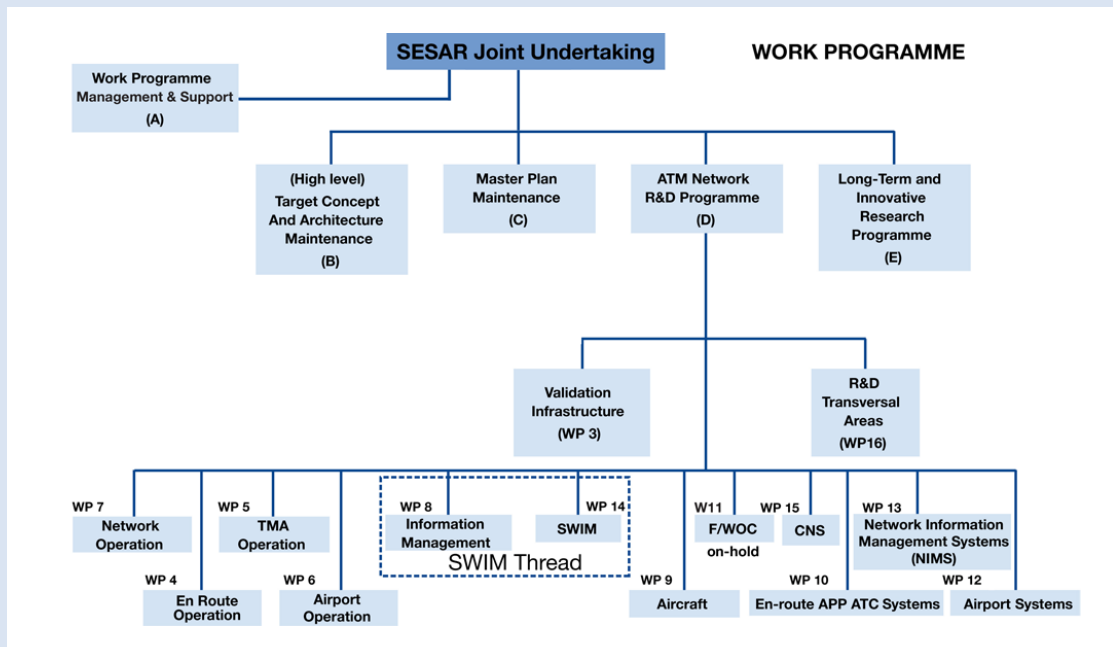


SESAR WORK PROGRAMME

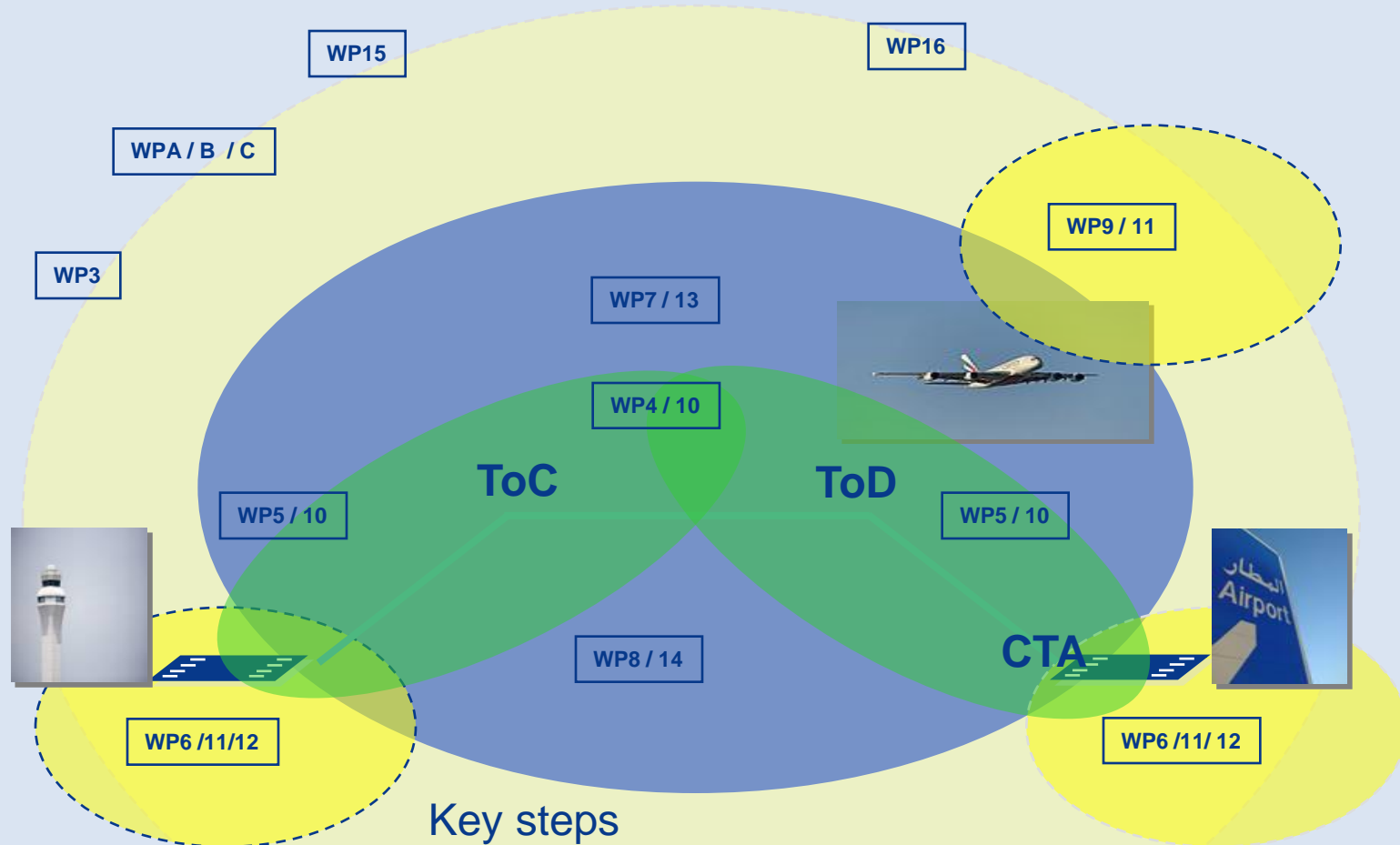
16 Work Packages organized in logical groups

Three key work package types

- Overall & Transverse
- Operational Domains
- Systems / Technical Domains



A WP for every step of the flight



Key steps

- Time based operations
- 4 D Trajectory operations
- Performance based operations over a SWIM/IP network



The Implementation

A man and a woman in business suits are in starting blocks on a running track, ready to start a race. The man is in the foreground, looking intensely at the camera. The woman is in the background, also looking forward. The track has white and yellow lane markings.

SESAR Implementation Phase Roadmap

IP1 - Deployment 2008-2012

- Improve the current system
- Prepare for Trajectory/Time-based Operations
- A 'baseline' for SESAR and transition to new operating concepts
- Content is 'maturity' based

IP2 - Development for Deployment 2013-2019

- Described by the SJU Work Programme [www.sesarju.eu]
- Over 200 projects to be refined in 2009 with the selected partners
- Validation using operational trials where practicable
- Early implementation with quick-win projects included

IP3 - Research and Development for Deployment from 2020

- Under development in the SJU Work Programme
- Long-term research agenda and Scientific Committee being established



IP1

Scope (provisional)

Information Management

- SWIM institutional preparations

Airspace & Network Management

- On-line NOP availability

CNS Systems & Infrastructure

- Datalink communication (initial) in accordance with mandate
- European Ground Communications using IP

TMA/En-route Operations

- Approach management and sequencing

Airports

- Implementing Airport CDM
- Ground Movement Control (A-SMGCS level 1&2)
- Safety Nets to cover runway incursions
- Basic Departure Manager
- Initial Airport Datalink
- Environmentally sustainable Airport Operations
- Optimised runway utilisation (mixed mode, LVP's, I/MLS improvements)



IP2

What's in the SJU Work Programme?

IP2 Structure and Content:

Threads of activity

- Operations (Airline, Military & ANSP)
- Systems Development
- Information Management
- Target Architecture, safety etc

Delivering Operational Improvements

- Validated 'close to the market'

Raising service levels through deployment

- Information Management
- Network Management
- Trajectory Management & Automation
- Airports & Aerodrome ATC



Zoom in the future technical features



INFORMATION MANAGEMENT

Airline aspects



AIS/MET Services & Data Distribution

- AIS and MET information to the crew or the avionics systems during flight
- Additional information of increased situational awareness to the crew or avionics systems

System-Wide Information Management (SWIM)

- Airline operations systems
- Aircraft systems

Business and Mission Trajectory

- Interoperability



NETWORK MANAGEMENT

Airline aspects



Airline Operations

- Improving flight efficiency – Route, emissions, scheduling
- Business trajectory at the heart of new operational concept
- Network operations planning shared

Airspace Management

- Civil/Military co-operation to optimise use of airspace
- Military operations included in network planning and execution

Collaborative decisions

- Optimised trajectory during operations
- Joint decision-making when they are needed
- Best decisions taken with knowledge of all relevant information



TRAJECTORY MANAGEMENT, and AUTOMATION – Airborne aspects 1



Communications Systems

- Flexible communication for voice and datalink
- Future ATS Datalink with civil-military interoperability
- SWIM - a/c on the network with seamless and secure operation

Navigation Systems

- Optimised arrival and approach for emissions & noise
- Support RNP to Precision approach transitions
- Multi-constellation GNSS, transition to future GNSS based systems
- Systems suitability for Approach with Vertical Guidance

Surveillance Systems

- ADS-B 1090 Higher performance
- ADS-B In/Out for Military transport aircraft
- ADS-B and other surveillance data fusion for enhanced operations



TRAJECTORY MANAGEMENT, and AUTOMATION – Airborne aspects 2



Flight Management Avionics

- Initial and full 4-D Trajectory management and data exchange with ground systems
- Architecture evolution and roadmap with International agreement
- Continuous cruise climb support

Safety Nets and protection systems

- TCAS evolution for all a/c types and multi-threat
- ASAS Self Separation technical feasibility
- Weather hazards and Wake Vortex detection systems
- Flight control and separation optimisation in wake encounter
- Enhanced and Synthetic Vision systems



AIRPORTS, and AERODROME ATC Aircraft aspects



Communications Systems

- Airport surface Datalink Services enabling enhanced surface CNS systems and information distribution
- Taxi clearances by voice and datalink

Navigation Systems

- GBAS for CATII/III operations
- Taxi routing by datalink

Surveillance Systems

- Traffic display (situational awareness)

Safety nets and Protection Systems

- Traffic alerts



Deployment Criteria

Validated Concept and Technology (Maturity)

Demonstrable Service Improvement

Convincing Business Case

Appropriate Standardisation / Regulation

Stakeholders agreed to timely deployments



CONCLUSION

SESAR is excessively complex

Public Private Partnership is the only way

SESAR is fully part of the Single European Sky



Questions & Answers

www.sesarju.eu



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