

2011



founding members



EUROPEAN COMMISSION



EUROCONTROL

SESAR Release



2011

The first SESAR Release explained

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SESAR reveals first components of the future European ATM system

SESAR starts to deliver! With the first SESAR Release, the SESAR Joint Undertaking (SJU) and its members pave the way to make air traffic management in Europe more efficient, safer, cheaper and more environmentally friendly. SESAR is about research and development that brings benefits to all air transport actors:

- **Airlines** will start to save time and money through smoother and more direct approach procedures towards airports. 2011 will bring for example improvements to the operational procedures for Precision Area Navigation aiming at increasing capacity and lowering the environmental impact in complex terminal areas.
- **Pilots'** needs are taken into account as of the first Release. Validation of initial 4D trajectory will pave the way for bringing pilots closer to the ideal flight.
- With the results of the SESAR Release 2011, **airports** will start to be better integrated into the European network operations.
- Improving the work environment of **air traffic controllers** is part of the first SESAR Release. Enhanced human machine interfaces for controller working positions will ensure that all relevant information will be provided to the controller at the right time, in an easy and intuitive way. Advanced procedure for air traffic control (ATC) sector team organisation will enable the controllers to better cope with complex traffic situation.
- **Passengers** will profit from more timeliness and predictability. The first SESAR Release will entail exercises for the harmonisation of departure and arrival operations.
- Through more efficient flight operations, the **environment** will benefit from lower fuel burn and consequently fewer emissions.
- A better **cost effectiveness** for ATM operations will result from the provision of air traffic services at one airport from a control facility located on another airport (remote tower operations).

members



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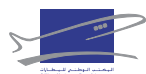


skyguide



THALES
AUSTRALIA

02 2,000 experts working on SESAR



The SESAR programme is the operational and technological answer to Europe's air traffic management challenges. The aim of the SESAR Joint Undertaking (SJU) is to ensure the modernisation of the European air traffic management system by coordinating and concentrating all relevant research and development efforts in the European Union.

Using the ATM Master Plan developed during the definition phase of the SESAR programme, the work programme defines all projects and activities to be undertaken in the 2008-2016 timeframe. The aim of the SESAR programme is to develop and deliver the necessary operational and technical materials (specifications, procedures, prototypes, validation reports, etc) for the progressive industrialisation, deployment and operation of the new European ATM system.

2,000 engineers and experts from 49 different members and associate partners are today working on the future European air traffic management system with a short term goal: **the first SESAR Release.**

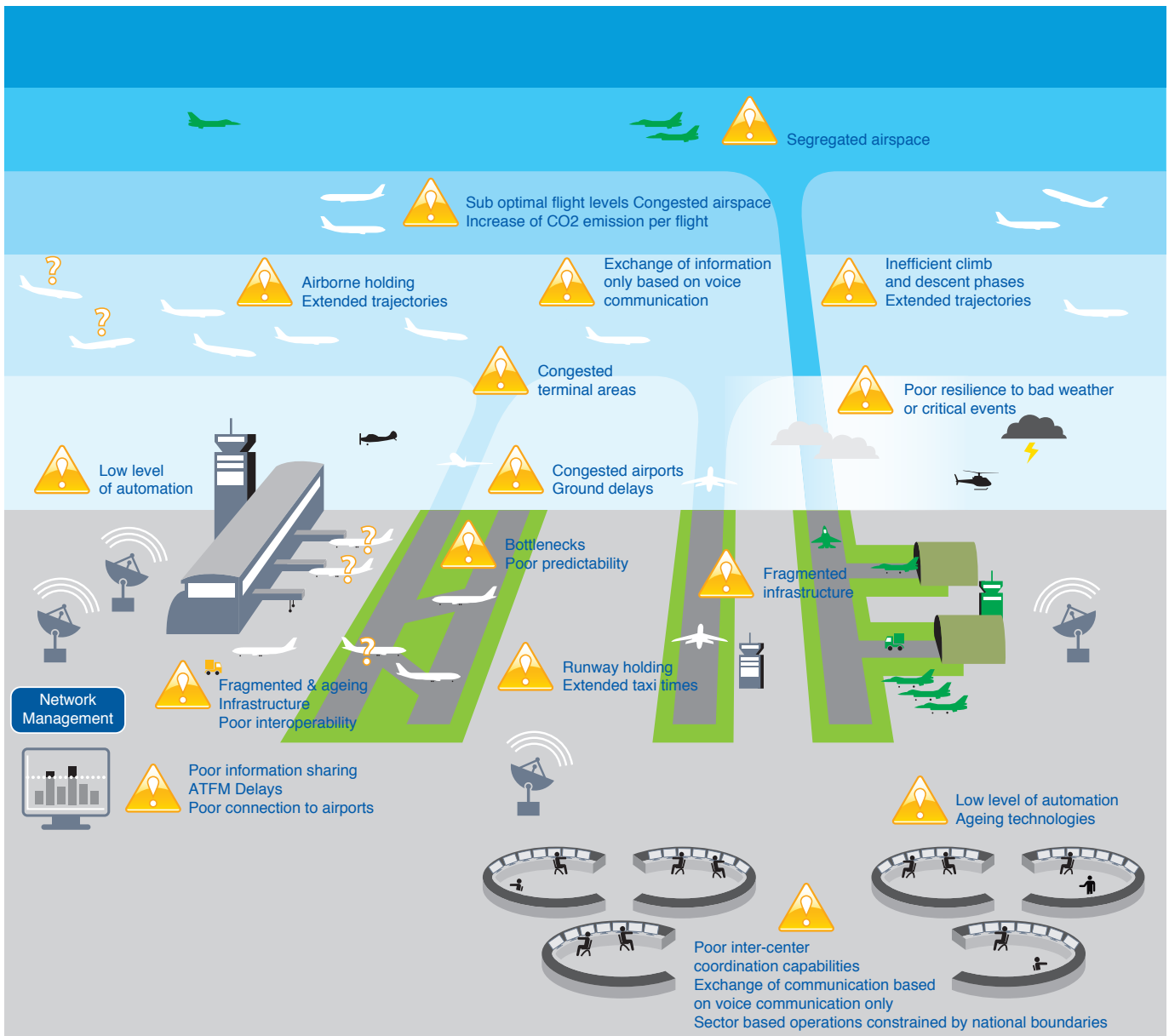
Reformed European skies

Once all the SESAR

deliverables will be developed and implemented by the entire air transport industry, the European sky will look very different than today. Tomorrow's aviation will benefit from SESAR's new operational concept. At its heart is the flight and its trajectory. While this may sound obvious, it isn't the case today. Air traffic management is primarily organised

around different airspace sectors. With increasing complexity and traffic over the last decades, this organisation has imposed significant constraints resulting in inefficiencies for the passengers, the airlines and the environment: delays, sub-optimal flight levels, extra routings, airborne holding... SESAR puts the trajectory of each flight again in the centre of attention. With air traffic management as its enabler.

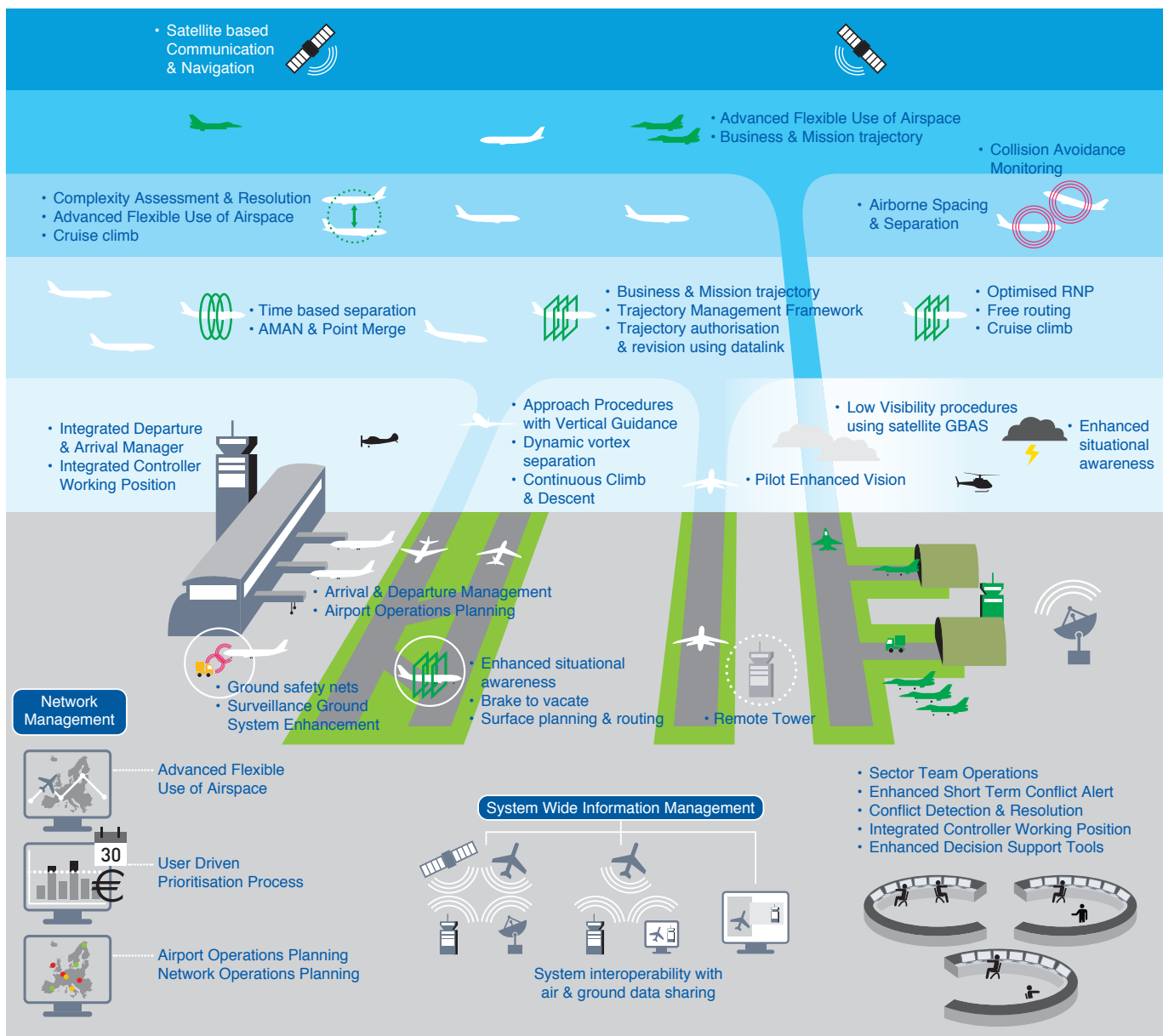
Air traffic management today



With SESAR, all participants in the air traffic management (ATM) process (airlines, controllers, airports, but also meteorological centres, etc.) will share the same data which will dramatically improve the planning and decision making process of each flight. All participants have a common view of an ongoing flight and access to the most accurate data available to perform their specific tasks. This will allow increased flexibility without fearing delays

or distortions. Planning decisions can be made as late as possible and they will be continuously updated to answer to real-time demands. Airspace users will be able to choose their preferred routes while today, they need to adhere to fixed ones. An important aspect of the new SESAR concept is the sharing of information also with military and state airspace users with a view to better integrating them in the air traffic management process.

The SESAR air traffic management system



The new operational

concept will also increase airspace capacity by reducing controller workload and minimising tactical interventions. State-of-the-art technology will be at the full service of pilots, increasing certainty through datalink communication between air and ground and the delegation of some spacing and separation tasks to the cockpit. SESAR will allow for a sensible automation of tasks whilst the human will always remain at the core of the operation.

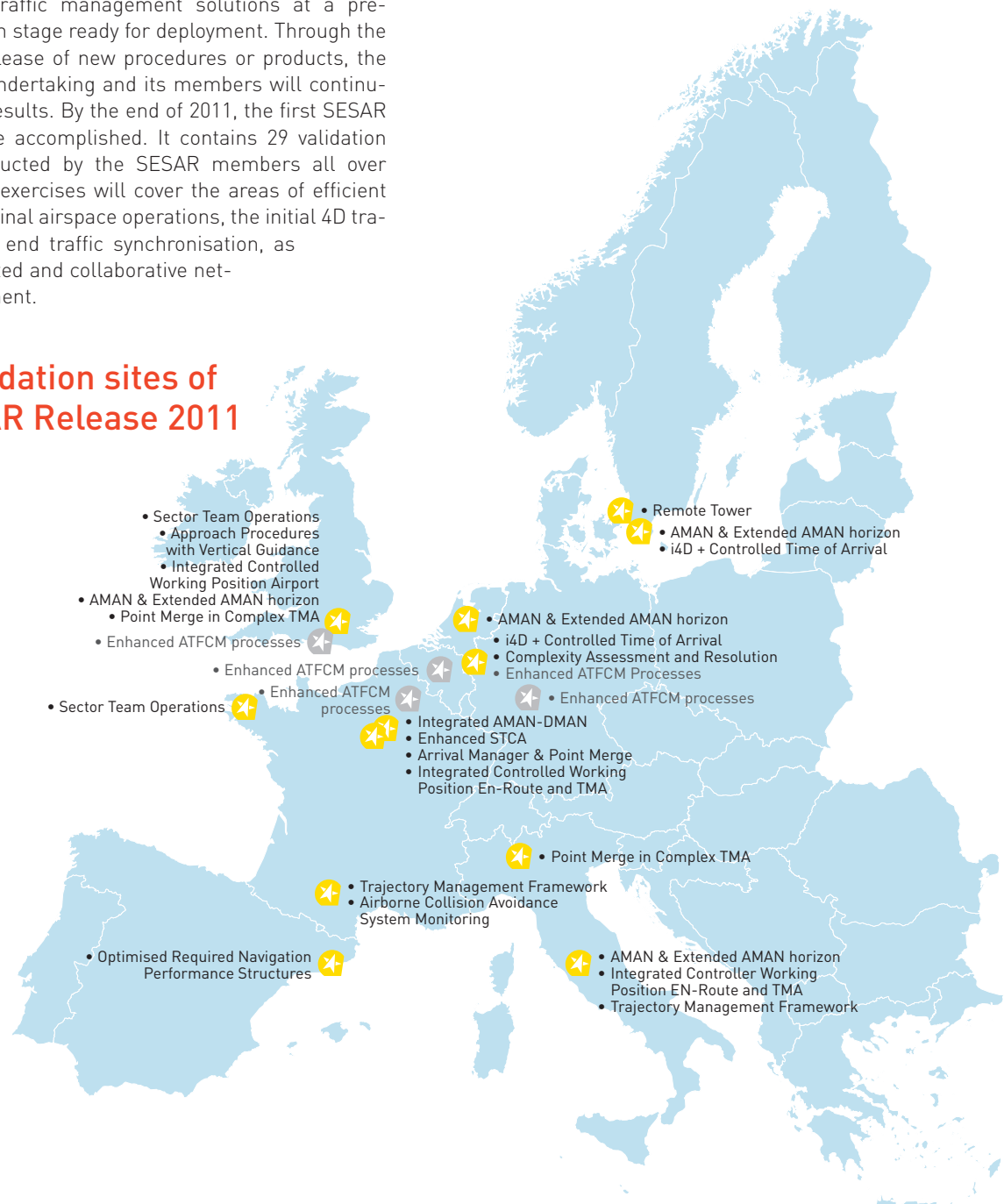
Also capacity on airports – the nodes of the air traffic system – will be increased through their full integration into the ATM network as well as the deployment of a number of new technologies and procedures helping them to optimise their operations. As a consequence, more aircraft can land and take-off from a given airport with fewer delays.

Achievements of the first SESAR Release

The aim of a SESAR

Release is to present to the aviation community new or improved air traffic management solutions at a pre-industrialisation stage ready for deployment. Through the incremental release of new procedures or products, the SESAR Joint Undertaking and its members will continuously provide results. By the end of 2011, the first SESAR Release will be accomplished. It contains 29 validation exercises conducted by the SESAR members all over Europe. Those exercises will cover the areas of efficient and green terminal airspace operations, the initial 4D trajectory, end to end traffic synchronisation, as well as integrated and collaborative network management.

Main validation sites of the SESAR Release 2011



1) Optimised Required Navigation Performance Structures

Through validation exercises conducted in Barcelona by AENA, procedures, requirements and updated operational guidelines for Precision Area Navigation in complex terminal areas will be delivered.

The **procedures** will increase capacity and lower the environmental impact through more precise routing of an aircraft leading to an increased deployment of Precision Area Navigation in Europe.

2) Point Merge in Complex Terminal Control Area

On platforms operated by ENAV and NATS, point merge-procedures will be validated. They will rely on better exploiting the Flight Management System (FMS) without radar vectoring, constrained by controller instructions on speed and level. The exercises aim at facilitating Continuous Descent Arrivals and at providing a baseline for trajectory based operations in the Terminal Manoeuvring Area (TMA).

New **procedures** and better exploited Flight Management Systems will improve and harmonise arrival operations while minimising the environmental impact of a flight.

3) Approach Procedures with Vertical Guidance

The achievement of the exercise conducted by NATS is to have validated approach procedures with vertical guidance using Satellite Based Augmentation System. This will pave the way to the ability to fly Instrument Landing System type approaches to airports independently of ground based infrastructure.

The **future satellite supported** procedures will increase the safety of aircraft operations.

4) Trajectory Management Framework

The achievement of two exercises conducted by ENAV in Rome will be the completion of initial procedures and requirements for an initial 4D (i4D) concept for supporting the management of a single controlled time arrival constraint in the en-route and terminal phase of flight.

DSNA will in Toulouse validate procedures and requirements for trajectory management revision considering a flow rerouting scenario as well as an unexpected closure of airspace.

The validation exercises will deliver a **common baseline** to pave the way for the initial 4D trajectory.

5) Sector Team Operations

Through shadow mode and live trials at the DSNA Brest air traffic control centre as well as operational simulations at NATS London, procedures to improve sector team organisation and coordination (roles & responsibilities) and further requirements on tools support and information sharing will be delivered.

The **procedures and software** will allow more efficient management and coordination among controllers in their team.

6) Enhanced Short Term Conflict Alert (STCA)

Thales will validate in this exercise procedures, requirements, a prototype and cases for enhanced Short Term Conflict Alert (STCA). This enhanced STCA will support controllers in identifying conflict between flights inside TMA wherein difficult operations are conducted (e.g. IFF/VFR traffic, complex interface with arrival/departure sectors, etc) and in avoiding false alarms.

The **enhanced software** will increase the safety of flight especially during complex operations.

7) Airborne Collision Avoidance System Monitoring

DSNA will validate specifications and cases for new altitude capture laws to avoid false alarm in high vertical climb and descent rates; to link the Airborne Collision Avoiding System to the autopilot; and to achieve a quantified overall safety gain.

The existing airborne collision avoidance **system** will be improved.

8) Integrated Arrival and Departure Manager (AMAN-DMAN)

Through live trials at Paris Charles de Gaulle airport, DSNA will validate procedures and requirements for basic DMAN capabilities at a single airport as well as for establishing the departure sequence with sufficient quality taking into account surface and departure management processes.

The new **procedures and software** will help to better synchronise traffic at airport level to gain efficiency by increasing automation, timeliness and predictability of flights and traffic flows.

9) Arrival Manager & Extended AMAN horizon

ENAV, LVNL, NATS and NORACON will validate in four different locations through operational simulations procedures on extending the arrival tasks to the en-route controllers within the AMAN horizon of a related airport.

The **procedures and software** ensure a better sequencing of arriving flights reducing the workload of terminal approach controllers and increasing the capacity in the terminal area.

10) Arrival Manager & Point Merge

DSNA will test in live trials procedures, requirements, and cases for using Point Merge in TMA-Extended concept for achieving Continuous Descent Approach from high level altitude in high level traffic load.

The new **procedures** will lead to the smoothing of the trajectory approach resulting in better cost effectiveness, lower environmental impact and will support the execution of the 4D trajectory.

11) i4D + Controlled Time of Arrival

Eurocontrol, LFV and Airbus will through flight trials deliver procedures for both en-route and TMA environments covering computed and predicted Controlled Time of Arrival features exchanged between aircraft and ground using initial 4D capability in traffic synchronisation as well as impacts on cockpit integration and human factors.

The **prototype and procedures** will enhance datalink services supporting the 4D trajectory.

12) Complexity Assessment and Resolution

In shadow mode trials, Eurocontrol Maastricht will test a complexity prediction tool which is based on controller capabilities to solve different complex situations in the airspace, but also possible controller resolutions in the traffic prediction through continuous simulations.

The **new tool** sets will help air traffic controllers to better anticipate and cope with complex traffic situations.

13) Enhanced Air Traffic Flow and Capacity Management Process

Through live trials in the Air Traffic Services Units in Brussels, Reims, London, Frankfurt or Karlsruhe and Maastricht, enhancements of the CFMU Human Machine Interface and Network Operational Plan Portal for Short Term Air Traffic flow & Capacity Management Measures (STAM) will be achieved. STAMs are pre-defined scenarios aimed at improving the traffic flow between ATC sectors in coordination with the CFMU for optimising the related sectors capacities.

The **coordination procedures and their supporting interfaces** will allow for the best use of available airspace to safely meet the demand of airspace users also in changing conditions (e.g. weather or unexpected traffic changes).

14) Integrated Controller Working Position Airport

NATS will validate specification for a data entry panel to be deployed at airfields enabling the tower controllers to be in electronic communication with CFMU concerning the departure status of aircraft under their control. The shadow mode trials will be exercised on two different prototypes.

Thanks to this new communication **device**, synchronisation between the airfield and the network manager for the precise departure of an aircraft will be improved.

15) Integrated Controller Working Position En-Route and TMA

ENAV and DSNA will test prototypes for a new Human Machine Interface for TMA controller working position with improved design, addressing human factors related issues.

The air traffic controller work station **prototype** will have an improved ergonomic system interface design.

16) Remote Tower

At Ängelholm Airport, NORACON will perform ATC services on a single airport from a remote site through a NATMIG remote tower prototype.

Remote tower **technology** will allow air traffic at small or medium-sized airports to be managed and controlled remotely from a single, larger air traffic services centre.

Outlook SESAR Release 2012

Thanks to the outcome of the SESAR Release 2011, the SJU is starting to develop the new ATM system Europe needs. We are on our way. 2012 will bring a second wave of results. The planning of the SESAR Release together with our members will start in March 2011 and will build upon the Release 1 activities. Initial 4D features and data exchange will continue to be developed for further improving the synchronisation between the airborne and ground flight profiles while activities will be performed at airports to improve surface management and runway throughput. In the terminal airspace area efforts will concentrate on Continuous Descent Approaches and Continuous Climb Departures to further increase efficiency and lower the environmental impact. Certainly, the SESAR Release 2012 will also contain elements for better end-to-end traffic management.

**“Today’s partners
for tomorrow’s
aviation”
is now a reality!**

The SESAR programme is the operational and technological answer to Europe's major air traffic management challenges. The aim of the SESAR Joint Undertaking is to ensure the modernisation of the European air traffic management system by coordinating and concentrating all relevant research and development efforts with a view to harmonising implementation. Partnership, sustainability and user orientation are the founding principles of the SESAR Joint Undertaking's work approach.

SESAR's key performance targets for 2020 are to

- enable a threefold increase in capacity
- improve safety by a factor of 10
- reduce by 10% the environmental impact per flight
- cut ATM costs by 50%





www.sesarju.eu

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