

SESAR SOLUTIONS CATALOGUE



In a nutshell

Delivering high-performing aviation for Europe



Air traffic management is a key enabler for a sustainable and high-performing aviation sector in Europe, as highlighted by the EU Aviation Strategy. There are 27,000 flights passing through Europe daily, representing 26 % of the world market. The sector directly employs 2 million European citizens and contributes EUR 110 billion to EU GDP. It ensures that remote areas of Europe can stay connected and benefit from industries such as tourism. SESAR is a perfect example of how to effectively pool private and public resources to research and deliver deployable innovative solutions to modernise air traffic management.

I invite all aviation stakeholders to download the SESAR Solutions Catalogue and start to implement the future of aviation today!

Violeta Bulc
European Commissioner for Mobility and Transport

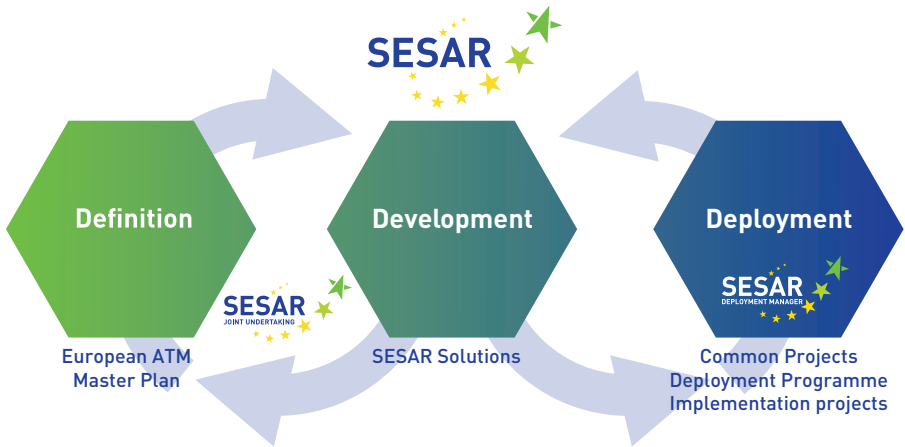


www.sesarju.eu/newsroom

What is SESAR?

Air traffic management (ATM) is an essential part of European air transport and aviation, connecting cities and people citizens as well as boosting jobs and growth. However, Europe's ATM system is based on ageing technology and procedures and needs updating. As one of the most innovative infrastructure projects ever launched by the European Union, SESAR's role is to define, develop and deploy what is needed to increase ATM performance and build Europe's intelligent air transport system.

Defining, delivering and deploying SESAR



SESAR Joint Undertaking

A unique public-private partnership, in place since 2007, uniting:



2 founding members:
EU and Eurocontrol



19 industry members



100+ companies
from across air traffic
management



60+ universities,
research centres and SMEs



3,000 experts from
aviation and ATM

What are SESAR Solutions?

SESAR Solutions refer to new or improved operational procedures or technologies that aim to contribute to the modernisation of the European and global ATM system. Each solution includes a range of documentation, including:

- Operational services and environment descriptions;
- Safety, performance and interoperability requirements;
- Technical specifications;
- Regulatory recommendations;
- Safety and security assessments;
- Human and environmental performance reports.

The first edition of SESAR Solutions catalogue contains 63 Solutions, of which 24 are being deployed across Europe simultaneously (Pilot Common Project).

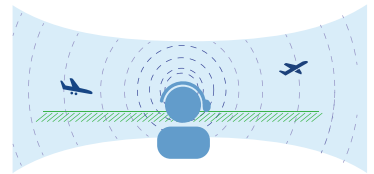


Rolling out SESAR Solutions

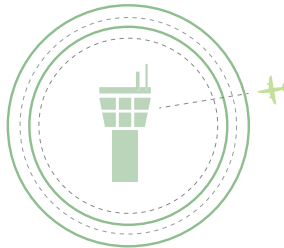
Work is underway to implement the solutions in the catalogue. Here are just a few examples of these implementations and the benefits that they are bringing.

Remote technology at your service

In 2014, the world's first **SESAR remote tower services (RTS)** opened for business in Sundsvall, serving Örnsköldsvik airport **over 150 km away**. SESAR is also delivering RTS solutions to **serve two low-density airports or as a contingency tower**. Demonstrations are underway in Ireland and Germany with a view to further implementation of remote tower solutions.



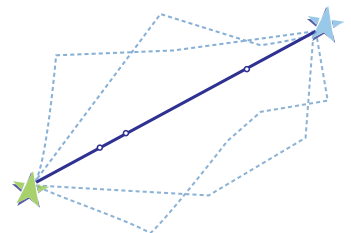
Assigning holding to history



Extended-arrival management (E-AMAN) allows for the sequencing of arrival traffic much earlier than is currently the case, so allowing more smooth traffic management. London-Heathrow has implemented the solution and has already **cut holding times in its arrival stacks by one minute, reducing noise emissions and saving airlines over EUR 2 million in fuel bills and 7 500 tonnes of carbon dioxide annually**. The solution, which is part of synchronised deployment plans (PCP), has already been implemented in 7 other locations in Europe.

Free and smarter skies

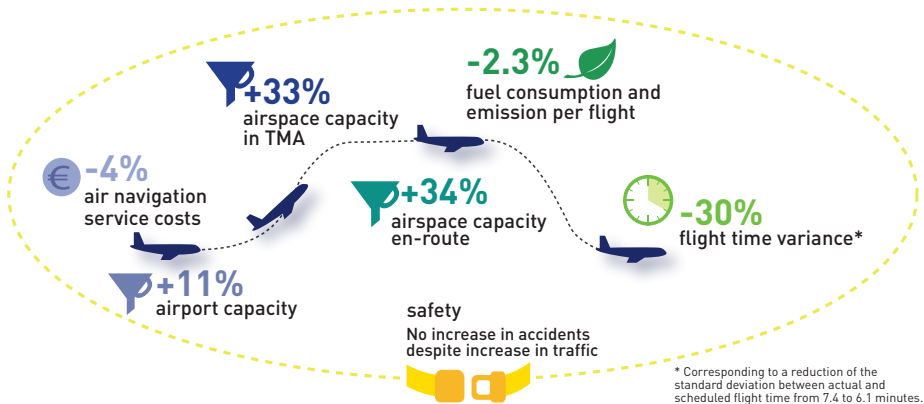
Free-routing allows an aircraft to plan freely their route, optimising their respective flights in line with individual operator business needs and military requirements. Around **25 % of the European network** has implemented steps towards free routing area. Flying distances are reduced by approximately **7.5 million nautical miles (NM)**, representing the equivalent of **45,000 tonnes of fuel saved, or reduced emissions of 150,000 tonnes, or EUR 37 million**.



Delivering performance

Performance is at the heart of SESAR, which is why every SESAR Solution is assessed and documented according to a set of key performance areas, notably safety, cost efficiency, operational efficiency, capacity, environment, security and human performance¹.

The performance of these solutions is contributing to the High Level Goals of the Single European Sky, an initiative of the European Commission to de-fragment Europe's airspace.


































[1] Source: 2015 Performance Assessment (B.5-D71). The figures refer to the performance assessment made on all the SESAR results captured by 2015 relative to the 2005 baseline. This includes solutions which are ready for industrialisation (V3), solutions for which more work is planned under SESAR 2020 (V2) and developments with regard the deployment baseline.

SESAR Solutions



































SESAR Solutions have been categorised according to four key areas of ATM (key features), meeting the needs of the entire community.

High-performing airport operations

Precision approaches using GBAS Category II/III	 
Time-based separation	 
Automated assistance to controllers for surface movement planning and routing	   
D-TAXI service for controller-pilot datalink communications (CPDLC) application	  
Manual taxi routing function	  
Guidance assistance through airfield ground lighting	  
Virtual block control in low-visibility procedures	  
Airport safety nets for controllers: conformance monitoring alerts and conflict detection	
Enhanced ground controller situational awareness in all weather conditions	
Runway status lights	
Enhanced traffic situational awareness for vehicle drivers	
Departure manager (DMAN) baseline for integrated AMAN DMAN	 
Pre-departure sequencing supported by route planning	 
Departure management integrating surface management constraints	  










































SESAR Solutions

Advanced air traffic services

Flow-based integration of arrival and departure management	  
Integrated and throughput-optimised sequence of arrivals and departures	  
ATC and AFIS services in a single low-density aerodrome from a remote controller working position (CWP)	
Single remote tower operations for medium traffic volumes	
Remote tower for two low-density aerodromes	
Remotely-provided air traffic services for contingency situations at aerodromes	
A low-cost and simple departure data entry panel for the airport controller working position	 
Airport operations plan (AOP) and its seamless integration with the network operations plan (NOP)	 
Extended arrival management (AMAN) horizon	  
Point merge in complex terminal airspace	  
Arrival management (AMAN) and point merge	   
Continuous descent operations (CDO) using point merge	
Precision area navigation (P-RNAV) in a complex terminal airspace	  
Optimised route network using advanced required navigation performance (RNP)	  
Enhanced terminal operations with RNP transition to ILS/GLS	    
Enhanced terminal operations with RNP transitions to LPV	  

SESAR Solutions

Optimised ATM network services

Approach procedures with vertical guidance					
Arrival management into multiple airports					
Controlled time of arrival (CTA) in medium-density/ medium-complexity environments					
ASAS spacing applications 'remain behind' and 'merge behind'					
Sector team operations - en-route air traffic organiser					
Multi-sector planning					
Medium-term conflict detection (MTCD) and conformance monitor tools					
User-preferred routing					
Free route through the use of direct routing					
Free routing for flights both in cruise and vertically-evolving above a specified flight level in low-to-medium density airspace					
Enhanced short-term conflict alert (STCA) for terminal manoeuvring areas (TMAs)					
Enhanced short-term conflict alerts (STCA) with downlinked parameters					
Enhanced airborne collision avoidance system (ACAS)					
Initial collaborative network operations plan (NOP)					
Automated support for dynamic sectorisation					
Variable profile military reserved areas and enhanced civil-military collaboration					
Automated support for traffic complexity detection and resolution					

SESAR Solutions

Enabling aviation infrastructure

Advanced short-term ATFCM measures (STAMs)	€	Funnel	Leaf	Headset		
Calculated take-off time (CTOT) and target time of arrival (TTA)	Funnel	Funnel	Funnel	Leaf	Recycling	Headset
Enhanced air traffic flow management (ATFM) slot swapping	€	Leaf				
User-driven prioritisation process (UDPP) departure	€	Leaf				
Initial ground-ground interoperability	€	Headset				
AOC data increasing trajectory prediction accuracy			Recycling	Headset		
Extended flight plan			Recycling	Headset		
Digital integrated briefing	€	Headset				
Meteorological information exchange	€	Leaf	Headset			
Initial system-wide information management (SWIM) technology solution	€					
ACAS ground monitoring system				Headset		
Improved hybrid surveillance				Headset		
Aeronautical mobile airport communication system (AeroMACS)	€	Funnel	Headset			
Air traffic services (ATS) datalink using Iris Precursor	€	Headset				
Flexible communication avionics	€	Headset				
ADS-B surveillance of aircraft in flight and on the surface				Headset		

SESAR in a global context

The SESAR Solutions Catalogue is a one-stop-shop for air navigation service providers, airports, airlines and other stakeholders to browse the technologies and procedures necessary for deploying Europe's ATM system in line with the European ATM Master Plan. To further support implementation, additional technical information about each solution is packaged and available on the SESAR JU website. The Catalogue is also a means to encourage the export of SESAR Solutions to the global market in full accordance with the International Civil Aviation Organization's (ICAO) Aviation System Block Upgrade (ASBU) initiative.





founding members



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