SESAR 2020: developing the next generation of European Air Traffic Management

- Delivering safer, cleaner and more cost-efficient air travel;

- Pooling public and private R&D investments to advance the Single European Sky;

- Ensuring on-time, resilient and seamless air traffic worldwide with global partners;

- Making European airspace attractive for worldwide passengers.

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What is the challenge?

Every year over 1.6 billion passengers take one of Europe's annual 10 million flights – expecting to have a safe and smooth journey without any delays or cancellations and to arrive on time at their destination with luggage in hand. Meeting these expectations is the job of Europe's Air Traffic Management (ATM) system, which up until now has safely and effectively managed the flow, movement and density of traffic in our skies.

But with flights forecast to increase to 16.9 million by 2030, the current ATM system needs to keep pace and be updated with the latest technologies and operational procedures in order to avoid fragmentation and cater for more flights in an efficient, safe and environmentally-friendly manner. A modernised air transport system, characterised by innovative technology and the timely delivery of competitive products and services, will be vital for the economy, society and cohesion of Europe.

What is SESAR 2020?

The SESAR 2020 (Single European Sky ATM Research) Research and Innovation (R&I) Programme will demonstrate the viability of the technological and operational solutions already developed within the SESAR R&I Programme (2008-2016) in larger and more operationally-integrated environments.

At the same time, SESAR 2020 will prioritise research and innovation in a number of areas, namely integrated aircraft operations, high capacity airport operations, advanced airspace management and services, optimised network service performance and a shared ATM infrastructure of operations systems and services. SESAR 2020 will retain its founding members, the European Union and Eurocontrol.

Existing industry members have already expressed their intention to continue in the partnership and new members and associate partners are expected to join as a result of the call for expression of interest launched in 2014.

What results and benefits do we expect?

SESAR 2020 will bring new ideas to the market and increase the pace of change in ATM. Like its predecessor, the SESAR 2020 Programme will be the technology pillar of the European Union's Single European Sky (SES). It will therefore contribute to delivering the SES, which aims to triple airspace capacity to reduce delays; improve safety performance by a factor of 10, reduce environmental

impact by 10% and reduce the cost of ATM services to the airspace users by 50%. Ultimately, this means greater mobility and choice for passengers in Europe; a more collaborative and better performing network; and airspace where all vehicles, from regular aircraft to remotely piloted civil aircraft, are safely integrated.

How much will it cost?

SESAR 2020 will work with a budget of €1.5 billion, of which €500 million will be provided by the European Union and the rest by Eurocontrol and industry. A further €85 million is earmarked for research activities particularly designed to attract universities, public institutions, SMEs and industry.

How will it be run?

The SESAR R&I 2020 Programme will be managed by the SESAR Joint Undertaking (SJU), which manages the current SESAR Programme. The governance of the SESAR Joint Undertaking is ensured by the Executive Director and Administrative Board, which is composed of the SESAR founding members, equipment manufacturers, civil and military airspace users, airports, and air navigation service providers, staff associations and the scientific community.

What has the current SESAR R&I Programme achieved so far?

The current SESAR R&I Programme has succeeded in bringing together all ATM stakeholders. More than 3000 experts have focussed on overcoming the previous fragmentation in Europe's ATM R&D through a comprehensive and coordinated research roadmap (the European ATM Master Plan). Within this current programme timeframe, SESAR has produced tangible technological and operational solutions (SESAR Solutions) that meet the business needs of ATM, with some already proving their readiness for deployment.

Notable programme achievements have been the world's first flight in four dimensions (3D + time) to enhance end-to-end trajectory information exchange; remote tower services to boost regional economies an extensive toolkit to increase safety on airport runways; free routing to reduce flight and fuel

4D flights to better manage air traffic

Today, air traffic controllers rely mainly on radar surveillance to position an airplane and predict its trajectory up to five minutes ahead. While effective, radar only allows controllers to manage immediate and easily predictable traffic conflicts or congestion, but not complex traffic flow issues further ahead, which can lead to increased flight delays, fuel costs and emissions. Initial four-dimensional trajectory management (i4D) aims to overcome these shortcomings by connecting aircraft and ground systems to optimise the aircraft trajectory in three dimensions plus time.

The sharing of trajectory information between the air and ground can enable a safer and more efficient handling and certainty of flights. Controllers can clearly see on their screens the actual ground and airborne trajectories, which allows them to resolve any discrepancies and anticipate flight paths with greater precision. On the airborne side, the aircraft can better manage their speed profile, which leads to fuel savings and fewer emissions. The sharing of trajectory also means that aircraft sequences can be managed with greater efficiency in the approach and landing phase, reducing congestion at busy airports. Flight trials have demonstrated the maturity and robustness of i4D in real traffic conditions, confirming the important safety and environmental gains as well as increased flight predictability and overall network efficiency.

More information:
www.sesarju.eu/i4D

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Initial 4D trajectory management will make air traffic control safer and more efficient.

emissions; and seamless information interchange between all providers and users of ATM information to deliver collaborative decision-making.

Useful links

SESAR: www.sesarju.eu