

...**FLORIAN GUILLERMET**

Innovation as a driver of Europe's air traffic performance

A key enabler for the competitiveness and sustainability of Europe's aviation industry, innovation offers the means to drive Europe's air traffic performance, explains SESAR Joint Undertaking Executive Director **Florian Guillermet**

HOW IS THE SESAR JOINT UNDERTAKING CONTRIBUTING TO THE EU'S AVIATION STRATEGY?

The SESAR Joint Undertaking (SESAR JU) was set up ten years ago to research and develop ways of modernising European air traffic management (ATM) – a complex and highly-fragmented system. As acknowledged by a European Court of Auditors report last year, we have succeeded in transforming a previously uncoordinated R&D environment into a coherent one, pooling the resources and expertise of airspace users, air navigation service providers and airports, and leveraging support from the European Union's Horizon 2020 programme. We also defined a common modernisation roadmap and delivered a comprehensive set of solutions to improve the safety, efficiency, capacity and sustainability of Europe's ATM. This partnership approach has given Europe greater influence in the global aviation arena, particularly in setting international standards and shaping the Global Air Navigation Plan of the International Civil Aviation Organization (ICAO).

WHY ARE WE FACING AN AIRSPACE CAPACITY CRISIS TODAY?

When air traffic control centres were first established within each State, they were built close to radars or radio antennas, within the line of sight of

flying aircraft. As traffic increased, the airspace above the centres was divided into an ever-increasing number of adjacent sectors, allowing controllers to manage the aircraft safely at any given time. The system today still relies on this sector-based approach to managing traffic in Europe. As a result, available capacity in the system is geo-

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graphically constrained and cannot be activated when and where required to accommodate traffic demand dynamically. It also means that if one air traffic control centre has a problem, that

problem will inevitably spread. These systemic shortcomings are prompting politicians and stakeholders to ask; can we do something different to effect change more quickly?

HOW CAN SESAR HELP SOLVE THIS CAPACITY CRUNCH?

Our joint undertaking has developed technologies that can progressively increase system automation, making it more scalable. We've demonstrated that by aligning ways of working across air traffic control centres, we can maximise capacity. We also now have the means to improve airspace design and render its management more dynamically. The virtualisation of data services and introduction of satellite-based services for communications, navigation and surveillance have great potential to defragment Europe's airspace, providing capacity to the right place at the right time. What we are missing is an airspace architecture that can glue them all together and accelerate technology uptake.

SESAR: MODERNISING EUROPE'S AIR TRAFFIC

As the technological pillar of the Single European Sky initiative, SESAR aims to modernise and harmonise air traffic management in Europe. The SESAR Joint Undertaking (SESAR JU) was established in 2007 as a public-private partnership to support this endeavour. It does so by pooling the knowledge and resources of the entire ATM community in order to define, research, develop and validate innovative technological and operational solutions. The SESAR JU is also responsible for the execution of the European ATM Master Plan,

which defines the EU priorities for research and development (R&D) and implementation. Founded by the European Union and EUROCONTROL, the SESAR JU has 19 members, who together with their partners and affiliate associations represent over 100 companies working in Europe and beyond. The SESAR JU also works closely with staff associations, regulators, airport operators, airspace users, the military and the scientific community.

Learn more about SESAR: www.sesarju.eu

WHAT STEPS ARE BEING TAKEN TO ADDRESS AIRSPACE ARCHITECTURE?

In 2018 the European Parliament invited the European Commission to investigate a way out of this situation. With support from Eurocontrol's Network Manager, we developed a proposal for an airspace architecture aimed at leveraging the technologies available, while decoupling service provision from local infrastructure. The proposal, called the Airspace Architecture Study, foresees a progressive increase in the levels of automation, cyber-secure data sharing and connectivity. Airspace configuration and design needs to be optimised from a European network point of view, taking due consideration of major traffic flows across Europe. Data services will be made available to trusted users and will feed advanced air traffic control tools, allowing for operational harmonisation and will improve the performance of air traffic control centres around Europe. The recommendations have been endorsed in the “Wise Person's Group” report on the future of the Single European Sky. In the short term, measures are being put in place by the Network Manager to deal with the immediate challenges of this summer's traffic.

HOW CAN WE RECONCILE AVIATION CAPACITY EXPANSION WITH EUROPE'S ENVIRONMENTAL OBJECTIVES?

Forecasts suggest that demand for air travel will continue to grow both in Europe and globally. We cannot ignore that reality.

And it makes addressing the environmental impact of aviation all the more pressing. While inefficiencies in the air traffic management system account for a fraction of overall aviation emissions, it is nevertheless our obligation to ensure that air traffic operates as environmentally efficient as possible. For example, airspace capacity bottlenecks result in aircraft

burning fuel unnecessarily on the ground before take-off and in the air when flying longer. We are working to reduce the carbon footprint of a flight from start to finish, delivering solutions to reduce taxi-out times at the airport, and to optimise the aircraft trajectory once it is airborne so that it can fly the most fuel-efficient route possible.

HOW DO YOU SEE DISRUPTIVE TECHNOLOGIES IMPACTING AVIATION?

Like so many industries, advances in technology are shaking up aviation and in particular air traffic management, offering potential new fixes to old problems. Take artificial intelligence; we are making use of AI technologies such as machine and deep learning to better predict flight trajectories and traffic flows. These technologies are also providing automation support to pilots and air traffic controllers, allowing them to focus on safety critical tasks. The emergence of drone-related services is also prompting a surge of innovation in air traffic management, which the European Commission is championing through its U-space initiative for the safe and secure integration of drones alongside manned aviation. Our partnership is delivering a first set of technologically-enabled U-space services this year to manage these vehicles. It is clear that we are embarking on a new era in aviation. We must continue to harness emerging technologies to offer the most safe, sustainable and smart air travel to all. ★



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