Introducing the next generation of air traffic control

New flight data processing system
A DYNAMIC CHANGE TO MANAGING EUROPE’S AIR TRAFFIC

The new flight data processing system at EUROCONTROL’s Maastricht Upper Area Control Centre is at the forefront of the challenge to deliver a safer, more efficient and environmentally responsible air traffic management system for Europe.

The new system provides a leading-edge technology base for cross-border air navigation services, a key element in the European Commission’s Single European Sky (SES) programme.

NEW TECHNOLOGIES FOR A PERFORMANCE-DRIVEN AIR TRAFFIC MANAGEMENT SYSTEM

In line with the ambitious targets of the SESAR programme for network capacity, effectiveness and emissions reductions, the new flight data processing system at Maastricht will contribute to the development of a more effective, performance-driven air traffic management system in Europe.

Europe’s air traffic management community will be able to cope with the new challenges facing air travel only if new ways can be found to increase the performance of Europe’s ATM system – and that means handling more flights, but with higher levels of safety, environmental responsibility and efficiency than ever before.

The objectives of the Single European Sky ATM Research (SESAR) programme are to transform the European air traffic management (ATM) system by synchronising the plans and actions of the various partners and federating resources. In the long-term, the SESAR programme aims to triple capacity, while improving safety by a factor of ten, with 10% fewer emissions per flight, at half the cost of today’s system.
To meet these targets a range of new technologies will be needed. Humans and machines will have to work in new ways to process the growing amount of data required to compute the safest and most efficient routes through Europe’s skies.

An important new-generation ATM system has come online in the EUROCONTROL Maastricht Upper Area Control Centre (UAC) greatly increasing the potential for controllers to offer shorter and more direct routes, optimal flight profiles and alternative routes in some of Europe’s busiest and most complex airspace.

**GREATER FLIGHT EFFICIENCY**

- The new flight data processing system is not just smarter and more efficient than the former system – it is based on an entirely different operating philosophy.

The Maastricht UAC manages 260,000 sq km of upper airspace above the Benelux countries and northwest Germany, handling in excess of 1.5 million flights a year. Air traffic will increase further in the future and flight efficiency is a key concern to the aviation industry.

A key component of air traffic control’s technology is the flight data processing system which, in essence, electronically processes flight plans and updates, correlating them to the radar tracks on the
controller’s display and ensuring that information on the flight’s progress is sent automatically to other controllers in other sectors or in adjacent centres.

The new flight data processing system at Maastricht is not just smarter and more efficient than the former system – it is based on an entirely different operating philosophy. It is trajectory-based, rather than route-based. This means that controllers have the most accurate flight information at all times.

In the past, flight plans had to follow the rigid pattern of airways that criss-cross the skies above the continent. If a flight changed course to shorten its route or change destination an entirely new flight plan had to be created. But with a trajectory-based system the initial trajectory requested by the aircraft is continuously updated with radar data and inputs from the controller, reflecting the clearances provided to the aircraft and the planned sector sequence. This helps controllers get a clearer and safer picture of the air traffic situation and plan the most efficient flight profile on the basis of real-time information.

A trajectory-based system also means that advanced new tools such as Medium-Term Conflict Detection (MTCD) – which automatically alerts controllers of potential conflicts some 20 minutes in advance – are integrated into the flight data processing system.
With the new system the entire airspace controlled by Maastricht UAC can be managed more flexibly. Sectors can be easily re-shaped to reflect changing traffic demand patterns, specific weather conditions or areas that are temporarily reserved for military operations.

More automated controller-pilot messages are possible, again cutting workload and the risk of verbal miscommunications. Controller-pilot data link communications (CPDLC) have been used at Maastricht for over a decade now; the new flight data processing system provides more advanced CPDLC functions and will allow for their further expansion. Controller-pilot data link communications are now fully integrated into the controller’s tools allowing its features to be used seamlessly alongside the other functions.

The benefits do not stop there. An air traffic controller workload monitoring function will also ensure that controllers’ workload is taken into account in the capacity planning process.

The new flight data processing system is a system developed with and by air traffic controllers. The close collaboration between industry, civil and military operational staff and local engineers from the outset of this wide-ranging programme has ensured that the new tools are widely accepted by all those who have to use them on a daily basis.
THE EUROPEAN DIMENSION

The new system provides the technology base for effective cross-border air navigation services, a key element in the Single European Sky programme. Since 1972, Maastricht UAC has been a pioneer of multinational operations and a Functional Airspace Block avant la lettre.

The new flight data processing system at Maastricht provides a set of powerful new tools to ensure that increasing traffic load can be handled in a more flexible way, whilst maintaining safety and increasing the overall capacity and efficiency levels in one of Europe’s busiest areas of airspace. It will help minimise delays and contribute to reducing aircraft fuel-burn and emissions – in line with the objectives of the SESAR programme.

Independent industry benchmarks have shown that Maastricht UAC is already one of the most efficient air navigation service providers in Europe. The new system will further enhance efficiency performance by allowing future improvements to be introduced in a modular way, meeting all the technical and operational requirements of the European Commission’s Single European Sky (SES) programme.

The new system will furthermore be used to carry out sophisticated pre-operational validation work and support research in a live, complex operational environment for future ATM technologies in Europe as part of the Single European Sky ATM Research (SESAR) initiative.