

Mission Trajectory : a new concept is born

The operational concept to accommodate military and State aircraft in the SESAR environment is becoming a reality. The Mission Trajectory can be seen as **a pragmatic approach to satisfy the performance requirements expressed by the Network manager and by the military users.**

The performance objectives identified to respond to the expected traffic increase represent a challenge for the military airspace users. More specifically, the extension of the arrival management horizon and the introduction of free routing will lead the military airspace users to operate in an increasingly complex environment.

At the same time, the military airspace user's needs in terms of flexibility and access to the airspace will remain unchanged, featuring in particular the increased use of fighters equipped with long-range weapon systems and the advent of Unmanned Aerial Systems (UAS).

The Mission Trajectory concept has been created to respond to these challenges and to cover military-specific needs not covered by the Business Trajectory, such as:

- specific flight profiles, implying the use of Area Reservation/Restrictions (ARES)
- aircraft formations with splits and merges
- trajectory synchronisation needs for flights participating in a complex mission or exercise
- high-priority flights and unplanned flights (e.g. for air policing),
- confidentiality and security issues.

The aim of the Mission Trajectory concept is to preserve or improve mission effectiveness and safety while providing at the same time benefits to the network.

The main operational change underlying the Mission Trajectory concept is the sharing of information on trajectories with the ATM community from the planning to the execution phase.

This will require improved interoperability between civil and military capabilities. For the military and State aircraft operators, the increase of data sharing will create a common situational awareness between civil and military actors, which will be beneficial in terms of flexibility (for the military), predictability (for the network) and safety (for all airspace users).

For the next 15 years, the concept gives priority to the seamless exchange of airspace and flight data between all users of the European airspace. Although some functionalities are already implemented locally, the challenge is to agree on harmonised procedures and standards which safeguard the basic operational and security requirements.

The following evolutions will constitute important improvements and will be the basis of the future implementation of the fully-fledged 4D-trajectory concept:

- new airspace design options offering more modularity (Variable Profile Areas)
- real-time sharing of airspace activation/deactivation status among all interested ATM stakeholders
- sharing with the network of military AIPs, notams, early flight intent, OAT flight plans and real-time flight data
- collaborative Decision Making for airspace booking, using automated means connecting mission preparation systems at “Functional Airspace Blocks” and network levels
- synchronisation of Airspace Management process with ATFCM (Air Traffic Flow and Capacity Management) process
- implementation of a transit service to accommodate en-route mission trajectory requirements

These operational changes will not only be beneficial to the network but will also offer the military better en-route services, especially for cross-border operations within or between Functional Airspace Blocks (FAB).

The technical implications of these evolutions will mostly concern military ground systems and will imply in particular the interfacing of military and civil airspace management and flight planning systems at FAB and Network levels.

On the airborne side, military avionics will be driven by the progressive deployment of validated technologies. The expected data-link and surveillance capabilities will concern transport-type aircraft while new specifications in terms of navigation performance should have a wider impact on military fleets.

In the longer term, by mid-2020 and later (SESAR Steps 2 and 3), the trajectories will be negotiated and shared with all interested parties from the planning phase through the execution phase. This will imply more demanding air/ground data link capabilities for all users of the airspace.

Additionally, new airspace design options such as Dynamic Mobile Areas (DMAs) will be introduced. The airspace management process will be fully integrated with the ATFCM process and the trajectory description will become the basis for negotiation between the military airspace users and the Network Manager.