

SESAR Solution

Point Merge in Complex TMA – Quick-Win

Contextual note

Purpose:

This contextual note is a vehicle to summarize the results stemming from Release delivery activities. It provides a summary of the SESAR Solution in terms of results of the Validation exercises and achievements as well as additional activities to be conducted before or as part of deployment.

This contextual note is part of a package prepared for each SESAR Solution for which exercise results are conclusive and sufficient to support a decision for industrialisation. It complements a technical data pack comprising available deliverables required for further industrialization.

In addition, adequate consideration of the recommendations on the regulatory and standardisation frameworks and the regulatory and certification activities is required. These recommendations are detailed in the 'SESAR Solution Regulatory Overview – Point Merge in Complex TMA' included in the technical data pack.

Improvement in ATM Operations

Using a Point Merge centric P-RNAV route structure for complex TMA demonstrated improvements of ATM cost effectiveness and increase in capacity in the TMA. A further increase in runway throughput is potentially achievable depending on aerodrome layout. This increased capacity is achieved without impairing surrounding aerodromes.

This new procedure design builds upon the P-RNAV concept for merging traffic into a single entry point, which allows efficient integration and sequencing of inbound traffic together with Continuous Descent Approaches (CDA).

Operational Improvements – OI Steps

AOM-0601 (DB)

Terminal Airspace is adapted in line with the availability of airspace and the capability of aircraft. Airspace organisation is enhanced in some Terminal Airspace with the use of best practices. Terminal Airspace Capacity is enhanced by applying best practice and exploiting the upgraded aircraft capabilities to optimise all or any of the following aspects as appropriate: - placement of SIDs/STARs and instrument approach procedures (as regards distance flown, flight profile, time, cost and flexibility to all users) and exploiting the use of RNAV to those ends; design of terminal airspace structures and ATC sectorisation with a view to evenly distributing ATC and flight crew workload; minimising adverse ATM related environmental impact.

Background and validation process

EXE-05.07.04-VP-228 performed at Rome ACC validated the concept through real time simulation. The trials demonstrated the operational feasibility and the benefits of implementing the Point Merge System (PMS) procedures in Milan's multi-airport Terminal Manoeuvring Area (TMA). The

Release 2 validation exercise complemented trials run in London TMA as part of Release 1 (EXE-05.07.04-VP-229).

Results and performance achievements

Capacity was increased in the TMA, with a 20% increase in the number of handled traffic per hour as inbound arrival capacity for Malpensa airport. Increased runway throughput is potentially achievable depending on aerodrome layout. This increased capacity has not impaired surrounding aerodromes.

Despite the capacity increase, the exercise's assessment revealed that TMA safety levels were maintained at current day levels or improved through:

- a reduction of tactical vectoring;
- single leg design allowing descent-enabled management of traffic not adequately spaced in the horizontal plane;
- increased situational awareness.

ATC controller productivity is also improved, with an estimated 50% reduction in R/T communication, 75% reduction in radar vectoring use, 20-25% time saving in handling the same number of arrivals to Malpensa airport as today.

Improved vertical profile allowing continuous descent and the availability of higher level for initial climb result in environmental benefits due to reduced fuel consumption and reduced emissions.

Additional activities

As part of the Deployment Baseline, AOM-0601 is considered as completed.

Actors involved

Actors involved in operations are:

- Air Traffic Controller
- Planning Controller
 - o En-Route Planning Controller
 - o TMA Planning Controller
- Executive Controller
 - o En-Route Executive Controller
 - o TMA Executive Controller
- ATS Supervisor
- Sequence Manager (Approach Coordinator)
- Traffic Complexity Manager
- Flight Crew, Pilot.

Impact on A/C system

Airspace Users will need to update Standard Operating Procedures.

Aircraft operators will need to update Minimum Equipment Lists.

Although most aircraft are P-RNAV compliant, non-compliant aircraft would need to be updated to enable them to operate in the new environment.

Some FMS may have insufficient memory for the increased number of waypoints.

Impact on ground systems

The Controller mode of operation is expected to change. These procedures have been designed with the goal of replacing open loop vectors in Approach for Arrivals (source: OSED).

Trajectories will need to be displayed on the controller's screen.

Conflict detection systems and safety nets will need to be modified and/or re-configured.

Consideration of Regulatory Framework

There is no specific topic in the field of the regulatory framework to be considered in deployment, beyond the applicable regulations currently existing.

Consideration of Standardisation Framework

Current existing standardisation frameworks, both at European and ICAO levels, are compatible with the implementation of this SESAR Solution.

Considerations of Regulatory Oversight and Certification Activities

Due consideration should be given to local adaptations of air navigation charts and ATCO and flight crew training procedures.

At present there are no European regulatory obligations to obtain formal approval prior to executing a visual approach and/or a contact approach. Specific requirements may be derived from the national rules of individual Member States, which should be taken into account.

Intellectual property rights (foreground)

The foreground is owned by the SJU.