

SESAR Solution

Enhanced STCA for TMA specific operations

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 – Enhanced STCA for TMA specific operations' included in the technical data pack.

Improvement in ATM Operations

Enhanced algorithms for a Short Term Conflict Alert (STCA) prototype ensures earlier warning and lower false and nuisance alert rates related to steady and manoeuvring aircraft, in comparison to existing STCA technology.

Operational improvement – OI Steps

CM-0801 - Ground Based Safety Nets (TMA, En Route).

Background

The SESAR Solution has been validated through EXE-04.08.01-VP-140 on Enhanced STCA for TMA specific operations.

The **purpose** of this exercise was to operationally validate an enhanced Short Term Conflict Alert (STCA) for Terminal control area (TMA) specific operations against operational requirements derived from EUROCONTROL Guidance Material for STCA.

This validation exercise focused on demonstrating acceptable operational performance of the Multi-Hypothesis STCA Algorithm functionality for TMA.

The validation exercise consisted of fast-time simulations using eleven days of recordings from 2010 of real traffic data and radar tracks from Lyon TMA.

It was based on the validation of enhanced algorithms for a STCA prototype aiming at identifying conflicts between flights in En-route and TMA through Comparative analysis (fast time simulations) of alerts using real traffic data between existing STCA (baseline) and pre-industrial STCA prototype.

The exercise allowed identifying potential areas where the enhanced STCA in TMA prototype could be improved; alerting performance was compared with a state-of-the-art STCA already operational in Lyon TMA, used as a benchmark and baseline for comparison.

Results and performance achievements

The exercises demonstrated both the operational and system feasibility of the prototype for the identification of conflicts between flights in Terminal Manoeuvring Areas (TMA).

Results indicate that the prototype, parameterised and tuned over a period of weeks, operates within acceptable limits of performance. It is expected to be operationally acceptable for relatively complex medium sized TMAs, comparable with Lyon TMA, with the order of 100,000 movements per year.

Additional activities

Human factors and local circumstances have a significant influence on determining what constitutes an operationally relevant conflict which must be alerted by STCA and what an effective minimum level of nuisance/false alarms is. The STCA needs to be tuned and adapted to local operational environment.

In addition, it was confirmed that a number of functionalities which have not yet been integrated by the prototype would drastically improve its performance.

Actors involved

ATCOs

Note: although the airspace users ultimately benefit from the tool, no new actions or systems are required for them to do so. Consequently, they are not actors in the new system.

Impact on A/C system

N/A

Impact on ground systems

The ATM system will need to be modified:

- STCA tools
- SDPS
- FDPS
- AEPS
- CWP
- Testing and maintenance

Consideration of Regulatory Framework

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

Consideration of Standardisation Framework

There is no specific topic in the field of the standardisation framework to be considered in deployment, with the potential exception of the standardisation of Safety Nets required to support RNP based operations.

Consideration of Regulatory Oversight and Certification Activities

In the elaboration of local safety arguments, the behaviour of pre-existing Safety Nets, and the response of ATCOs to nuisance alerts, must be considered.

A Safety Net cannot be considered a separation provision tool, as it should not provide safety credit to the nominal operation.

Intellectual property rights (foreground)

The foreground is owned by the SJU.