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|---------|-----|---|-----|-----|-----|-----|----|-----|-----|-------|--|
| SESAR | | Achieved | | | | | | | | ECAC+ | |
| ATC02.9 | | Short Term Conflict Alert (STCA) for TMAs | | | | | | | | | |
| REG | ASP | MIL | APO | USE | INT | IND | NM | MET | AIS | USP | |

Subject matter and scope

STCA (Short Term Conflict Alert) is a ground system designed and deployed to act as safety net against the risk of having collisions between aircraft during airborne phases of flight. STCA can be used in both en-route and TMA surveillance environments.

The difficulty of STCA development lies in the need to avoid having a high nuisance alert rate, while still making sure that real conflicts always trigger an appropriate and timely warning. Specific tuning is necessary for STCA to be effective in the TMA, in order to account for lower separation minima, as well as increased frequency of turns, climbs and descents.

It is therefore recognised that STCA may not be operationally usable in some dense TMA operations, because the nuisance alert rate generated by a linear STCA algorithm is evaluated to be too high.

The aim of this Objective twofold:

- To address the implementation of STCA functionality in TMAs
- For the TMA where, due to their complexity, the linear STCA algorithms are not fit for purpose, to address the improvement of the STCA functionality. This could be achieved by using multi-hypothesis algorithms, or other technical solutions ensuring earlier warning and lower nuisance alert rates related to steady and manoeuvring aircraft, in comparison to linear STCA algorithms.

NOTE 1: the scope of this Objective is limited to the deployment of the STCA functionality in TMAs. The (former) objective ATC02.2 which was addressing both en-route and TMA environments had its scope reduced to en-route allowing to consider it as achieved.

NOTE 2: SLoA ATC2.9-ASP02 does not have an associated FOC date and should be considered for specific local needs (refer to the description of SLoA below).

NOTE 3: : In certain more complex environments specific tuning is necessary for STCA to be effective especially in the terminal airspace in order to account for lower separation minima, as well as increased frequency of turns, climbs and descents. In these situations, the STCA may need to be improved with e.g. the use of multi-hypothesis algorithms, aiming to reduce the number of false and nuisance alerts compared to existing technologies, while maintaining the detection of genuine alerts (SLoA STCA02.9-ASP02). The improved STCA algorithms lead to more precise warnings and fewer false and nuisance alerts when compared against existing STCA technology.

NOTE FOR MILITARY AUTHORITIES: It is the responsibility of each military authority to review this Objective IN ITS ENTIRETY and address each of the SLoAs that the military authority considers RELEVANT for itself. This has to be done on top and above of the review of "MIL" SLoAs which identify actions EXCLUSIVE to military authorities.

Applicability Area(s) & Timescale(s)

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|--|--|--|------------|-----------------------|--|
| Applicability Area (Note: TMAs, according to local business needs) | | All ECAC States except: Albania, Bosnia and Herzegovina, Cyprus, Israel, Maastricht UAC, Morocco. Plus: Israel, Morocco | | | |
| Timescales: | | From: | By: | Applicable to: | |
| Initial operational capability | | 01/01/2018 | | Applicability Area | |
| Full operational capability | | | 31/12/2020 | Applicability Area | |

References

European ATM Master Plan

| | | | | | | | | | | |
|-----------|---|--------------------------------------|----------|---------------------------|---|---------|--|----------|--|--|
| Ol step - | [CM-0801]-Ground Based Safety Nets (TMA, En-Route) | | | | | | | | | |
| | Enablers - | CTE-S01 | CTE-S01a | ER APP ATC 133 ATC02.8 | PRO-059 | PRO-219 | | | | |
| Ol step - | [CM-0811]-Enhanced STCA for TMA specific operations | | | | | | | | | |
| | Enablers - | APP ATC 136 | | | | | | | | |
| Legend: | WXYZ-001 | Covered by SLoA(s) in this objective | | WXYZ-002 zzz | Covered by SLoA(s) in another objective Objective covering the enabler | | | WXYZ-003 | Not covered in the Implementation Plan | |

Applicable legislation

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|----------------|--|
| ATC02.9 | Short Term Conflict Alert (STCA) for TMAs |
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| -none- |
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Essential Operational Changes

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| - none - |
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SESAR Solution

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| #60 - Enhanced Short Term Conflict Alert (STCA) for Terminal Manoeuvring Areas (TMAs) |
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ICAO GANP - ASBUs

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| SNET-B1/2 | Enhanced STCA in complex TMAs |
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Deployment Programme

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| - none - |
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European Plan for Aviation Safety

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|---------|---|
| MST.030 | Implementation of SESAR solutions aiming to reduce the risk of mid-air collision en-route and TMA |
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Operating Environments

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|-------------------|
| Terminal Airspace |
|-------------------|

Stakeholder Lines of Action (SLoAs)

| SLoA ref. | Title | From | By |
|---------------|--|------------|------------|
| ATC02.9-ASP01 | Implement the STCA function in TMA | 01/01/2018 | 31/12/2020 |
| ATC02.9-ASP02 | Improve the STCA functionality | | |
| ATC02.9-ASP03 | Develop and implement ATC procedures related to the use of STCA in TMA | 01/01/2018 | 31/12/2020 |
| ATC02.9-ASP04 | Align ATCO training with the use of STCA in TMA | 01/01/2018 | 31/12/2020 |
| ATC02.9-ASP05 | Develop a local safety assessment | 01/01/2018 | 31/12/2020 |

Description of finalised and deleted SLoAs is available on the eATM Portal @ https://www.eatmportal.eu/working/depl/essip_objectives

Expected Performance Benefits

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|--------------------------------|---|
| Safety: | Identification of conflicts between flights in TMAs. STCA based multi-hypothesis algorithm will provide an improved STCA (improved rate of genuine alert while maintaining the rate of nuisance alerts at an operationally acceptable level), thereby enhancing safety in TMAs. For TMAs with high trajectory uncertainty where operation of a single-hypothesis STCA would currently unacceptable due to its low performance, the introduction of multi-hypothesis algorithms will make it possible to implement STCA. |
| Capacity: | - |
| Operational Efficiency: | - |
| Cost Efficiency: | - |
| Environment: | - |
| Security: | - |

Detailed SLoA Descriptions

| ATC02.9-ASP01 | Implement the STCA function in TMA | From: | By: |
|-----------------------------------|--|------------|------------|
| | | 01/01/2018 | 31/12/2020 |
| Action by: | ANS Providers | | |
| Description & purpose: | Put into service the STCA functionality to provide automated alerting of conflicts to approach controller workstations whilst avoiding false alerts (adapted for the specific TMA operating modes, flight characteristics and separation). Note :NOTE: The identification of the TMAs for which this SLoA is applicable is a local decision of the national stakeholders. | | |
| Supporting material(s): | EUROCONTROL - Safety Nets - A guide for ensuring effectiveness - August 2017 Url : https://www.eurocontrol.int/sites/default/files/publication/files/safety-nets-guide-august-2017.pdf EUROCONTROL - SPEC-108 - EUROCONTROL Specification for Short Term Conflict Alert - Edition 1.0 / 11/2007 Url : https://www.eurocontrol.int/publication/eurocontrol-specifications-short-term-conflict-alert-stca | | |

| ATC02.9 | | Short Term Conflict Alert (STCA) for TMAs | |
|-------------------------------|---|---|-------------------|
| ATM Master Plan relationship: | [APP ATC 136]-Adapt STCA for Operation in TMA [CTE-S01a]-SSR Mode A/C/S | | |
| Finalisation criteria: | 1 - Ground systems have been installed or upgraded to support the STCA function customised for use in TMA. 2 - STCA function is ready for operational use in specific TMAs. | | |
| ATC02.9-ASP02 | Improve the STCA functionality | From: - | By: - |
| Action by: | ANS Providers | | |
| Description & purpose: | Put into service or improve the STCA functionality with the use of e.g. multi-hypothesis algorithms or other technical solutions, where required. | | |
| | <p>Note :Note 1: The improved STCA for TMA operation shall be considered to be deployed by the High Complexity ATS units that provide the services within TMA boundaries where the linear STCA algorithm addressed by SLoA ATC02.9-ASP01 is deemed not sufficient.</p> <p>Note 2: The objective FOC does not apply to this SLoA. ASP02 is optional SLoA, it should be considered for specific local needs.</p> <p>Note 3: The status of this SLoA should not impact the objective status at the state level, and potential LSSIP DB warning should be ignored by CP in this context.</p> | | |
| Supporting material(s): | EUROCONTROL - Safety Nets - A guide for ensuring effectiveness - August 2017 Url : https://www.eurocontrol.int/sites/default/files/publication/files/safety-nets-guide-august-2017.pdf EUROCONTROL - SPEC-108 - EUROCONTROL Specification for Short Term Conflict Alert - Edition 1.0 / 11/2007 Url : https://www.eurocontrol.int/publication/eurocontrol-specifications-short-term-conflict-alert-stca SJU - SESAR Solution 60: Data Pack for enhanced STCA for TMA Url : https://www.sesarju.eu/sesar-solutions/enhanced-short-term-conflict-alert-stca-terminal-manoeuvring-area-tma-specific | | |
| ATM Master Plan relationship: | [APP ATC 136]-Adapt STCA for Operation in TMA [CTE-S01a]-SSR Mode A/C/S | | |
| Finalisation criteria: | 1 - Ground systems have been installed or upgraded to support the enhanced STCA function. 2 - Improved STCA function is ready for operational use in specific TMAs. | | |
| ATC02.9-ASP03 | Develop and implement ATC procedures related to the use of STCA in TMA | From: 01/01/2018 | By: 31/12/2020 |
| Action by: | ANS Providers | | |
| Description & purpose: | The local procedures should address the operational use of the STCA functionality in the TMAs. | | |
| Supporting material(s): | EUROCONTROL - Safety Nets - A guide for ensuring effectiveness - August 2017 Url : https://www.eurocontrol.int/sites/default/files/publication/files/safety-nets-guide-august-2017.pdf EUROCONTROL - SPEC-108 - EUROCONTROL Specification for Short Term Conflict Alert - Edition 1.0 / 11/2007 Url : https://www.eurocontrol.int/publication/eurocontrol-specifications-short-term-conflict-alert-stca SJU - SESAR Solution 60: Data Pack for enhanced STCA for TMA Url : https://www.sesarju.eu/sesar-solutions/enhanced-short-term-conflict-alert-stca-terminal-manoeuvring-area-tma-specific | | |
| ATM Master Plan relationship: | [PRO-059]-ATC Procedures to provide a systematic and common response to ground based Safety Net alerts [PRO-219]-ATC Procedures to give priority to SNET alarm | | |
| Finalisation criteria: | 1 - Procedures are in operational use. | | |
| ATC02.9-ASP04 | Align ATCO training with the use of STCA in TMA | From: 01/01/2018 | By: 31/12/2020 |
| Action by: | ANS Providers | | |
| Description & purpose: | All relevant personnel (e.g. air traffic controllers) have to be trained in the operational use of the STCA functionality in the TMA. | | |
| Supporting material(s): | EUROCONTROL - Safety Nets - A guide for ensuring effectiveness - August 2017 Url : https://www.eurocontrol.int/sites/default/files/publication/files/safety-nets-guide-august-2017.pdf EUROCONTROL - SPEC-108 - EUROCONTROL Specification for Short Term Conflict Alert - Edition 1.0 / 11/2007 Url : https://www.eurocontrol.int/publication/eurocontrol-specifications-short-term-conflict-alert-stca SJU - SESAR Solution 60: Data Pack for enhanced STCA for TMA Url : https://www.sesarju.eu/sesar-solutions/enhanced-short-term-conflict-alert-stca-terminal-manoeuvring-area-tma-specific | | |
| ATM Master Plan relationship: | [PRO-059]-ATC Procedures to provide a systematic and common response to ground based Safety Net alerts [PRO-219]-ATC Procedures to give priority to SNET alarm | | |
| Finalisation criteria: | 1 - The training plans have been updated and a training package has been developed for the use of STCA functions in TMA. 2 - The concerned personnel have been trained. | | |
| ATC02.9-ASP05 | Develop a local safety assessment | From: | By: |

| ATC02.9 | Short Term Conflict Alert (STCA) for TMAs | | |
|-----------------------------------|---|------------|------------|
| | | 01/01/2018 | 31/12/2020 |
| Action by: | ANS Providers | | |
| Description & purpose: | <p>When proceeding with the local implementation, changes in the ATM functional system derived from the deployment of STCA in TMAs are subject to the elaboration of a safety argument considering local specific risks and mitigation measures to those risks. The tasks to be done are as follows:</p> <ul style="list-style-type: none"> - Conduct hazard identification, risk assessment in order to define safety objectives and safety requirements mitigating the risks; - Develop safety assessment; - Deliver a safety assessment report to the NSA, if new standards are applicable or if the severity class of identified risks is 1 or 2. <p>This safety assessment shall be based on fully validated/recognised method.</p> | | |
| Supporting material(s): | <p>EUROCONTROL - Safety Nets - A guide for ensuring effectiveness - August 2017 Url : https://www.eurocontrol.int/sites/default/files/publication/files/safety-nets-guide-august-2017.pdf</p> <p>EUROCONTROL - SPEC-108 - EUROCONTROL Specification for Short Term Conflict Alert - Edition 1.0 / 11/2007 Url : https://www.eurocontrol.int/publication/eurocontrol-specifications-short-term-conflict-alert-stca</p> <p>SJU - SESAR Solution 60: Data Pack for enhanced STCA for TMA Url : https://www.sesarju.eu/sesar-solutions/enhanced-short-term-conflict-alert-stca-terminal-maneuvring-area-tma-specific</p> <p>EUROCONTROL - Air Navigation Systems Safety Assessment Methodology (SAM) - Version 2.1 / 11/2006 Url : https://www.eurocontrol.int/tool/safety-assessment-methodology</p> | | |
| Finalisation criteria: | 1 - The safety assessment report for the changes has been developed and delivered to the Regulator/NSA/Competent Authority, as necessary. | | |

