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| SESAR | | Active | | | | | | | LOC | |
| ATC20 | | Enhanced STCA with down-linked parameters via Mode S EHS | | | | | | | | |
| 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 as last Safety Net against the risk of collisions between aircraft due to separation loss. Enhanced STCA can be used both in En-Route and TMA radar environments to improve prediction of potential conflicts and reduce false alert rate. The difficulty of STCA development lies with the need to avoid a high false alert rate versus the need of ensure that all risk of collision always triggers a timely warning.

This objective addresses the enhancement of the STCA safety net with selected flight level (SFL) information down-linked from the suitably equipped aircraft via the Mode-S EHS protocol. Enhancing the STCA with the information downlinked from the aircraft will improve the warning times, decrease the rate of nuisance alerts and maintain or improve the rate of genuine alerts.

NOTE: The implementation of this functionality requires the appropriate equipment on board. The airborne carriage and operation of Mode S EHS capable transponders is addressed by objective ITY-SPI (ITY-SPI-USE06 and ITY-SPI-MIL02) based on the provision of Regulation (EU) No 2020587/386.

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 (ACCs and collocated ACCs/APPs. Stand-alone APP Units providing services to more than 100K IFR movements per year. Subject to local need.) | All ECAC+ States except: Armenia, Azerbaijan, Bosnia and Herzegovina, Bulgaria, Estonia, France, Georgia, Greece, Latvia, Malta, Morocco, Slovak Republic, Sweden, Ukraine | | |
| Timescales: | From: | By: | Applicable to: |
| FOC used for Analytics functioning only - not for implementation planning | 31/05/2019 | | Applicability Area |
| FOC used for Analytics functioning only - not for implementation planning | | 01/01/2030 | Applicability Area |

References

European ATM Master Plan

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|------------|--|--------------------------------------|-----------------|---|----------|--|
| Ol step - | [CM-0807-A]-Enhanced Short Term Conflict Alert using Mode S EHS data | | | | | |
| Enablers - | ER APP ATC 14 | | | | | |
| 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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| Regulation (EU) No 2020/587 amending Regulation (EU) No 1207/2011 (SPI) |
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Essential Operational Changes

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| Trajectory Based Operations |
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SESAR Solution

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| #69 - Enhanced STCA with down-linked parameters |
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ICAO GANP - ASBUs

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| SNET-B1/1 | Enhanced STCA with aircraft parameters |
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Deployment Programme

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| - none - |
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| ATC20 | Enhanced STCA with down-linked parameters via Mode S EHS |
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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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| En-Route |
| Terminal Airspace |

Stakeholder Lines of Action (SLoAs)

| SLoA ref. | Title | From | By |
|--------------------|---|------------|------------|
| ATC20-REG01 | Mandate the airborne carriage and operation of suitable equipment (Mode S EHS transponders) | 31/05/2019 | 01/01/2030 |
| ATC20-ASP01 | Deploy enhanced STCA function with the use of Selected Flight Level downlinked parameter | 31/05/2019 | 01/01/2030 |
| ATC20-ASP02 | Develop and implement ATC procedures related to the availability for display and use of SFL in the STCA functionality | 31/05/2019 | 01/01/2030 |
| ATC20-ASP03 | Align ATCO training to address the availability and use of the SFL downlinked parameter | 31/05/2019 | 01/01/2030 |
| ATC20-ASP04 | Develop a local safety assessment | 31/05/2019 | 01/01/2030 |

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: | A comparative analysis of STCA enhanced with the SFL DAP against conventional STCA showed that the use of the SFL DAP improves warning times, decreases the rate of nuisance alerts and maintains or increases the rate of genuine alerts. |
| Capacity: | - |
| Operational Efficiency: | - |
| Cost Efficiency: | - |
| Environment: | - |
| Security: | - |

Detailed SLoA Descriptions

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|-----------------------------------|--|---------------------|-------------------|
| ATC20-REG01 | Mandate the airborne carriage and operation of suitable equipment (Mode S EHS transponders) | From: 31/05/2019 | By: 01/01/2030 |
| Action by: | Regulatory Authorities | | |
| Description & purpose: | Mandate the equipage of fixed winged aircraft, with a maximum certified take-off mass exceeding 5700 kg or having a maximum cruising true airspeed capability greater than 250 knots, operating as IFR/GAT with appropriate equipment allowing the downlink of the Selected Flight Level information, via the Mode S EHS protocol. | | |
| | <i>Note :Note: for the EU States, the carriage requirement is addressed by the SPI Regulation (No 2017/386 amending Regulation (EU) No 1207/2011), therefore this SLoA is not relevant and should be considered as not applicable. The non-EU States may have to issue local mandates for the carriage and operation of EHS transponders.</i> | | |
| Supporting material(s): | EASA - CS ACNS - Certification Specifications for Airborne Communications Navigation and Surveillance - Issue 3 / 05/2021 Url : https://www.easa.europa.eu/document-library/certification-specifications/cs-acns-issue-3 EUROCAE - ED-73F - Minimum Operational Performance Specification for Secondary Surveillance Radar Mode S Transponders 12/2020 Url : https://eshop.eurocae.net/eurocae-documents-and-reports ICAO - Doc 9871 - Technical Provisions for Mode S Services and Extended Squitter - Advanced Edition / 04/2012 Url : https://store.icao.int/ | | |
| Finalisation criteria: | 1 - Mandate to equip the relevant aircraft with appropriate equipment has been issued by the regulator. 2 - Airworthiness certificate has been issued by the regulator for aircraft appropriately equipped (capability to downlink the SFL via Mode S EHS). 3 - Transponder operating procedure published in AIP | | |
| ATC20-ASP01 | Deploy enhanced STCA function with the use of Selected Flight Level downlinked parameter | From: 31/05/2019 | By: 01/01/2030 |
| Action by: | ANS Providers | | |

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| ATC20 | Enhanced STCA with down-linked parameters via Mode S EHS |
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| Description & purpose: | Put into service or enhance STCA functionality acquire and to make use of the SFL parameter downlinked from the aircraft via Mode S EHS. The required system changes may impact: <ul style="list-style-type: none"> • The surveillance chain • The STCA conflict detection algorithm • The Controller Working Position (CWP)/Human Machine Interface (HMI) | | |
| Supporting material(s): | 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 69: Data Pack for Enhanced STCA with down-linked parameters Url : https://www.sesarju.eu/sesar-solutions/enhanced-stca-down-linked-parameters | | |
| ATM Master Plan relationship: | [ER APP ATC 14]-Enhance Short Term Conflict Alert (STCA) to use Downlinked Aircraft Parameters | | |
| Finalisation criteria: | 1 - The ground system has the following capabilities: the SFL is considered against the CFL as part of the STCA conflict detection algorithm; the display of STCA alerts | | |
| ATC20-ASP02 | Develop and implement ATC procedures related to the availability for display and use of SFL in the STCA functionality | From: 31/05/2019 | By: 01/01/2030 |
| Action by: | ANS Providers | | |
| Description & purpose: | The local ATC procedures should address the display and use of the SFL downlinked parameter | | |
| Supporting material(s): | 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 69: Data Pack for Enhanced STCA with down-linked parameters Url : https://www.sesarju.eu/sesar-solutions/enhanced-stca-down-linked-parameters | | |
| Finalisation criteria: | 1 - Procedures are in operational use | | |
| ATC20-ASP03 | Align ATCO training to address the availability and use of the SFL downlinked parameter | From: 31/05/2019 | By: 01/01/2030 |
| Action by: | ANS Providers | | |
| Description & purpose: | All relevant personnel (e.g. air traffic controllers) have to be trained so as to take into account the availability of the SFL information. The training should take into account also the mixed mode operations, as not all aircraft will be able to downlink the SFL parameter. | | |
| Supporting material(s): | 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 69: Data Pack for Enhanced STCA with down-linked parameters Url : https://www.sesarju.eu/sesar-solutions/enhanced-stca-down-linked-parameters | | |
| Finalisation criteria: | 1 - The training plans have been updated and a training package has been developed 2 - The concerned personnel has been trained | | |
| ATC20-ASP04 | Develop a local safety assessment | From: 31/05/2019 | By: 01/01/2030 |
| Action by: | ANS Providers | | |
| Description & purpose: | When proceeding with the local implementation, changes in the ATM functional system derived from the enhancement of STCA with the use of SFL information are subject to the elaboration of a safety argument considering local specific risks and mitigation measures to those risks, in particular the mixed mode operations (aircraft not providing the SFL information). The tasks to be done are as follows: <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. This safety assessment shall be based on fully validated/recognised method. | | |
| Supporting material(s): | EUROCONTROL - EAM 4 - ESARR 4 - Risk Assessment and Mitigation in ATM - Edition 1.0 / 04/2001 Url : https://www.eurocontrol.int/publication/esarr-4-risk-assessment-and-mitigation-atm EUROCONTROL - GUID-159 - EUROCONTROL Guidelines for Short Term Conflict Alert - Part I to III - Edition 1.0 / 01/2017 Url : https://www.eurocontrol.int/publication/eurocontrol-guidelines-short-term-conflict-alert-stca 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 EUROCONTROL - Air Navigation Systems Safety Assessment Methodology (SAM) - Version 2.1 / 11/2006 Url : https://www.eurocontrol.int/tool/safety-assessment-methodology SJU - SESAR Solution 69: Data Pack for Enhanced STCA with down-linked parameters Url : https://www.sesarju.eu/sesar-solutions/enhanced-stca-down-linked-parameters | | |

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| ATC20 | Enhanced STCA with down-linked parameters via Mode S EHS |
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| Finalisation criteria: | 1 - The safety assessment report for the changes has been developed and delivered to the Regulator/NSA/Competent Authority, as necessary. |
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