

SECTION I: SE OVERVIEW

Study Topic Overview Summary In October 2008, the ASIAS Executive Board (AEB) directed its Issue Analysis Team (IAT) to conduct a follow-on study of TCAS alerts to address specific issues not focused on in earlier, broader studies. The study had several objectives: determine areas within the National Airspace System (NAS) where TCAS resolution advisories (RA) occur with high frequency, utilize NAS-wide results and expert input to guide focused investigations at key airports, and characterize the causes of RAs. In 2010, CAST adopted three SEs as a result of the study.

SE Objective The purpose of this SE is to reduce the rate of unnecessary TCAS alerts at high-altitude airports by identifying airports that have high incidents of RAs triggered by density altitude causing an increased TCAS sensitivity level. Based on site-specific analysis, determine what operational practices or additional guidance will contribute to a reduction in TCAS RAs.

Primary Risks Mitigated AIRPROX/TCAS Alert/Loss of Separation/Near Midair Collisions/Midair Collisions (MAC), Abrupt Maneuver (AMAN)

Action	Organization(s)	Strategy	Description	Due Date
Action 1	FAA ATO	Research	Complete a report identifying the necessary infrastructure to change the functionality of TCAS at high-altitude airports.	02/03/2011
<i>Comments: CAST closed this action based on completion of report by Lincoln Labs.</i>				
Action 2	FAA ATO	Research	Develop a prioritized list of locations for implementation of infrastructure and functionality changes to TCAS.	12/01/2011
<i>Comments: CAST closed this action based on identification of Denver International Airport (DEN) as only relevant airport.</i>				
Action 3	JIMDAT	Research	Determine severity of TCAS RAs at selected sites, categorize alerts, and recommend next steps.	Withdrawn
<i>Comments: CAST withdrew this action based on not pursuing ground-based TCAS desensitization command at DEN.</i>				
Action 4	FAA ATO	Research	Develop changes in operating practices at DEN to reduce TCAS RAs and coordinate implementation of these changes.	12/31/2024

See section II of this SE for detailed action descriptions.

References:

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SE 186 consists of four actions, which this section lays out in detail.

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SECTION III: SUPPLEMENTAL INFORMATION

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This section contains the following additional information that may be of interest to implementers:

- Source Study
- Related Initiatives
- Total Cost / Resource Overview

SECTION IV: REVISION LOG

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This section provides a history of revisions to this SE.

SECTION II: DETAILED ACTION INFORMATION

Action 1: Develop report identifying infrastructure needed for TCAS changes at high-altitude airports

*Primary
Implementer*

FAA Air Traffic Organization (ATO)

Action Objective

FAA ATO should charter a work group to complete a report identifying the necessary infrastructure to change the functionality of TCAS at high-altitude airports. This report should also include the safety impact of the recommended changes.

Action Timeline

Flow Time: 12 months

Due Date: 02/03/2011

*Timeline/Flow for
Future Adopters*

N/A

CAST Lead

FAA ATO

Organization(s) Detailed Steps

1a FAA ATO Develop a work group charter to conduct a study.

Complete.

1b Work Group Meet and develop a report of findings.

Lincoln Labs completed the report on February 3, 2011.

Notes

This study will determine feasibility and risk assessment.

SECTION II: DETAILED ACTION INFORMATION

Action 2: Develop prioritized list of locations for TCAS infrastructure/functionality changes

Primary
Implementer

FAA Air Traffic Organization (ATO)

Action Objective

FAA ATO should develop a prioritized list of locations for implementation of infrastructure and functionality changes to TCAS.

Action Timeline

Flow Time: 12 months

Due Date: 12/01/2011

Timeline/Flow for
Future Adopters

N/A

CAST Lead

FAA ATO

#	Organization(s)	Detailed Steps
2a	ASIIS	Develop data report of unnecessary TCAS alerts at high-altitude airports. <i>Complete.</i>
2b	FAA ATO	Reviews the ASIAS data and develop a prioritized list of airports for implementation of TCAS Sensitivity Level Command. <i>List completed December 1, 2011.</i>

Notes

SE focused on Denver International Airport (DEN).

SECTION II: DETAILED ACTION INFORMATION

Action 3 [WITHDRAWN]

Primary
Implementer

JIMDAT, MITRE

Action Objective

JIMDAT should determine severity of TCAS resolution advisories (RA) at selected sites. JIMDAT should categorize alerts and recommend next steps based on severity determined by analysis.

Action Timeline

Flow Time: N/A

Due Date: N/A

Timeline/Flow for
Future Adopters

JIMDAT determined in October 2014 that the resources required to implement a technical ground-based desensitization solution were unavailable and recommended withdrawal.

CAST Lead

JIMDAT

#	Organization(s)	Detailed Steps
3a	MITRE	Categorize RAs for specified airports and configurations.
3b	JIMDAT	Evaluate results and formulate a recommendation based on severity—nuisance alerts may require wide dissemination of advisories, moderate severity may require analysis of operating practices, etc.

Notes

- JIMDAT conducted a detailed analysis to recommend a change based on severity of alerts and offsetting risk.

SECTION II: DETAILED ACTION INFORMATION

Action 4: Develop changes in operating practices at Denver International Airport

Primary Implementer **FAA Air Traffic Organization (ATO) Mission Support (AJV),
FAA ATO Safety and Technical Training (AJI)**

Action Objective FAA ATO AJV and FAA ATO AJI should—

- Develop changes in operating practices at Denver International Airport (DEN) to reduce TCAS resolution advisories (RA). These changes should consider altitudes, merge points, distance between aircraft, and the potential operational impact on the traffic flow.
- Coordinate implementation of these changes with Denver Terminal Radar Approach Control (TRACON) representatives, other air traffic representatives and operators.

Action Timeline Flow Time: 54 months
Due Date: 12/31/2024

Timeline/Flow for Future Adopters TBD when CAST closes this action.

CAST Lead FAA ATO AJV, FAA ATO AJI

#	Organization(s)	Detailed Steps
4a	FAA ATO AJV, FAA ATO AJI	Through the metroplex process, coordinate efforts with the local Denver TRACON representatives, other air traffic representatives, and operators to implement a solution.
4b	JIMDAT	Monitor TCAS RA rates over time to determine effectiveness of solutions.

Notes In support of a final balanced solution, the following issues should be considered:

- Additional air mileage for operators,
- Air traffic control (ATC) workload increase, and
- DEN runway throughput impact.

SECTION III: SUPPLEMENTAL INFORMATION

Source Study Issue Analysis Team (IAT) TCAS Study (2008)

Related Initiatives

- SE 165, TCAS Policies and Procedures
- SE 188, Modifying Airspace Design and Air Traffic Control (ATC) Procedures
- SE 191, New TCAS/Next TCAS Equipment
- Airborne Collision Avoidance System X (ACAS-X) (TCAS Program Office)

Total Cost \$50,000

Action 1 \$0 TBD pending choice of action.

Action 2 \$0

Action 3 \$0

Action 4 \$50,000 1 FTE for 2 months

	Organization	Resources Needed
<i>Direct Resource Overview – Government</i>	FAA ATO	• Action 1: TBD pending choice of action.
	FAA ATO AJI	• Action 4: TBD based upon selection of mitigation strategy.
	FAA ATO AJV	• Action 4: TBD based upon selection of mitigation strategy.
	Work Group	• Action 1: TBD pending choice of action.
	Organization	Resources Needed
<i>Direct Resource Overview – Industry</i>	N/A	N/A

Indirect Resource Overview The organizations identified in this section are not expected to incur direct costs associated with implementing this SE, but they may incur indirect costs within their normal line of work.

	Organization	Description
	N/A	N/A



SECTION IV: REVISION LOG

Major revisions (whole numbers) represent CAST-approved changes to SE language. Minor revisions (decimals) represent minor changes to target dates or completion notes that do not affect implementer actions.

Revision	Date	Description
4.5	12/07/2023	Action 4 due date extended from 12/31/2021 to 12/31/2024.
4.4	10/07/2021	Action 4 Administrative due date extension from 8/30/2021 to 12/31/2021 for SRM Panel timeline to be established.
4.3	11/02/2020	Action 4 due date extended from 08/31/2020 to 08/30/2021.
4.2	07/01/2020	Action 4 due date extended from 06/30/2019 to 08/31/2020.
4.1	12/06/2018	Action 4 due date extended from 12/31/2018 to 06/30/2019.
4.0	09/17/2018	New SE format. Content reorganized and terminology updated. No substantive changes.
3.2	04/05/2018	Action 4 due date extended from 04/30/2018 to 12/31/2018.
3.1	12/07/2017	Action 4 due date extended from 12/31/2017 to 04/30/2018.
3.0	12/04/2014	Content reorganized and revised. Action 3 withdrawn.
2.0	06/06/2013	New DIP format. Content reorganized. Revised Action 3 Target Completion Date based on completion of Action 4. Action 1 closed. Action 2 closed. Action 4 added.
Original	12/02/2010	CAST adopted SE 186.