

TCAS Directed Study

Implementation Plan for

TCAS RA Reduction (SE 187)

Statement of Work: The purpose of this Safety Enhancement is to reduce the rate of unnecessary Traffic Alert and Collision Avoidance System (TCAS) alerts due to current TCAS alerting parameters.

Background:

In October 2008, the ASIAS Executive Board (AEB) directed its Issue Analysis Team (IAT) to conduct a study of TCAS alerts. 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.
- Characterize the causes of RAs.

A number of common themes emerged from the analyses. First and foremost, TCAS issues RAs in a number of situations where aircraft are adequately separated in accordance with air traffic control rules and procedures. For instance, in Class B and Class C airspace, controllers strive to maintain a minimum of 500 feet vertical separation between traffic flying under instrument flight rules (IFR) and traffic flying under visual flight rules (VFR). TCAS, however, may issue an RA to aircraft with as much as 600 feet of vertical separation. In another example, IFR aircraft arriving on closely spaced parallel runways under visual conditions may get a TCAS RA even if both aircraft are adequately separated for the arrival (and neither flight blunders into the other's path). Overall, the study team identified five themes falling into two groupings described below.

VFR and IFR Flight Interaction

- GA aircraft under tower control interacting with structured IFR traffic at a nearby airport.

An example of this theme is IFR arrivals to a large airport interacting with VFR arrivals, VFR arrivals and departures, or touch-and-go operations to a nearby general aviation airport.

- "Loitering" VFR traffic interacting with structured IFR traffic to/from a nearby airport.

An example is VFR traffic "loitering" in or near Class B airspace and interacting with IFR arrivals to a large airport. Some types of loitering traffic observed in data are radio or TV traffic reporting airplanes and helicopters, aerial photography, law enforcement, and aerial spraying of pesticides.

- Structured VFR flow interacting with nearby structured IFR traffic.

Examples include VFR helicopter routes and VFR transition routes/flyways in close proximity to IFR arrival or departure paths.

IFR and IFR Flight Interaction

- Visual approaches to parallel runways.

This type of RA occurs with visual approaches to closely spaced parallel runways, where ATC is not providing longitudinal spacing.

Arrival/departure interaction triggered by high closure rate. A common type of RA occurs between departures and arrivals to the same airport, or nearby airports.

Lead Organization for Overall Safety Enhancement Completion (LOOSEC) AIR

Safety Enhancement: (SE 187)

Reduce or eliminate the number of unnecessary TCAS alerts between IFR and VFR traffic operating at current Air Traffic standards of separation.

Outputs:

Output 1:

Conduct an RTCA study to evaluate TCAS solutions for alerts issued to airplanes separated by 500 feet.

Resources: AIR (LOOC), RTCA, ATO, AFS, MITRE, and Lincoln Labs

Timeline: 12 months following CAST approval

Actions:

1. AIR takes the lead in working with RTCA to conduct a study to develop consensus-based recommendations on the issues of this Output.
2. RTCA group meets and develops a report of recommendations.

Output 2:

If feasible, and based upon the report from Output 1 above, develop and publish the necessary technical standard order (TSO) and advisory material to provide more accurate alerts to aircraft separated by 500 feet.

Resources: AIR (LOOC), AFS, and RTCA

Timeline: 24 months from CAST approval

Actions:

1. Develop the necessary TSO.
2. Develop and publish the necessary advisory material.
3. Develop the means to communicate the need and the changes necessary to TCAS to all operators.