



**U.S. Department  
of Transportation  
Federal Aviation  
Administration**

# SAFO

Safety Alert for Operators

SAFO 22003  
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Flight Standards Service  
Washington, DC

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*A SAFO contains important safety information and may include recommended action. Besides the specific action recommended in a SAFO, an alternative action may be as effective in addressing the safety issue named in the SAFO. The contents of this document do not have the force and effect of law and are not meant to bind the public in any way. This document is intended only to provide clarity to the public regarding existing requirements under the law or agency policies.*

**Subject:** Traffic Alert and Collision Avoidance System II (TCAS II) Alerts at Denver International Airport (DEN).

**Purpose:** This SAFO serves to alert all operators and pilots of the high number of TCAS alerts when flying approaches to DEN RWY16L/16R and includes supplemental guidance and recommendations for evaluating TCAS II procedures.

**Background:** Following completion of the DEN RWY16R/34L airport improvement project in 2004, aircraft began receiving a high number of TCAS II alerts when flying instrument and visual approach operations to RWY16L/16R. These alerts occur because TCAS II alerting algorithms are not designed to account for this Air Traffic Separation standard, particularly visual approach conditions, and parallel approach courses at high field elevation airports. In 2010 the Commercial Aviation Safety Team (CAST) adopted a safety enhancement recommending the Federal Aviation Administration (FAA) “develop changes in operating practices at DEN to reduce TCAS II Resolution Advisories (RAs) and coordinate implementation of these changes.” In June 2019, DEN TRACON implemented a 1000' vertical offset during simultaneous operations to RWY16L/16R to reduce the risk of collision if an aircraft overshoots the final approach course.

**Discussion:** The FAA's recent data has shown that while the number of RAs between converging aircraft has decreased prior to final approach because of the 1000' vertical offset, the overall rate of RAs remains at a comparable level because of an increase in RAs for aircraft once on the final approach course for RWY16L/16R. The FAA is concerned about the continued high level of RAs because of the potential for increased risk of near midair and midair collisions.

Recent analysis conducted by FAA Flight Standards of mixed mode TCAS II functionality (i.e., Traffic Alert [TA]-Only and TA/RA) by flight crews during RWY16L/16R simultaneous approach operations indicates the following:

- Approximately 17% of operations indicate selection of TA-Only mode while aircraft are still converging on approach to runways RWY16L/16R.
- Approximately 20% of aircraft on approach to runways 16L/16R switched to TA-Only mode after receiving an RA.

These findings indicate to the FAA that current guidance contained in Advisory Circular (AC) 120-55C, Air Carrier Operational Approval and Use of TCAS II, is not sufficient for operators to perform adequate safety assessments for establishing flight crew procedures for use of TCAS II functionality during applicable operations. The FAA is also concerned that flight crews are desensitized to RA alerts inside and outside of DEN airport operations which may lead to other erroneous alert responses. The FAA intends to incorporate the content of this SAFO into AC 120-55C.

**Recommended Action:**

1. Aircraft operators are encouraged to review their risk assessment of TCAS II policy and procedures when DEN ATC is conducting simultaneous instrument and visual approach operations to RWY16L/16R. The risk assessment should consider:
  - Operating procedures in a TCAS II mixed-mode environment;
  - Loss of collision avoidance guidance with TCAS II in TA-Only mode;
  - The possible implications of TCAS II not returning to TA/RA mode in the event of a missed approach/go-around, including overall degradation to safety systems and;
  - Desensitization effects on flight crews caused by nuisance<sup>1</sup> TCAS II alerts at DEN 16L/16R.
2. Operators are encouraged to review flight crew operational procedures to ensure safe operations during TCAS II alerting scenarios at RWY 16L/16R. This review should include evaluating the adequacy of flight crew manuals, flight crew briefings, and flight training.

**Contact:** Questions or comments regarding this SAFO should be directed to the Flight Technologies & Procedures Division, at (202) 267-8790.

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<sup>1</sup> Nuisance Alert: An alert generated by a system that is functioning as designed but which is inappropriate or unnecessary for the particular condition. (From Advisory Circular 25.1322, *Alerting Systems*)