



STAR Ops and RNAV Departures

Structured arrival and departure procedures are critical elements of the Federal Aviation Administration's (FAA) efforts to modernize the air traffic system to be more efficient while maintaining or improving the current level of safety. The design of these procedures has evolved over time, with significant changes occurring between 2000–2010, including the implementation of area navigation (RNAV) departure routes that are programmed on the airport surface before takeoff and activated near takeoff. Changes were also made to standard terminal arrival (STAR) routes to minimize fuel usage by optimizing vertical profiles.

As more RNAV departures and optimized STARs were put into service, new safety issues were observed and previous safety issues were highlighted. The FAA and airline community recognized these new or increased risks and requested studies by the Aviation Safety Information Analysis and Sharing (ASIAS) program to investigate these issues before they result in a fatal accident. This is part of the evolution of safety analysis from a reactive, forensic activity toward a more proactive analysis.

The first ASIAS study was initiated in 2010 and focused on RNAV departure procedures. The second ASIAS study on STAR operations began in 2012. The results of the RNAV departure study were forwarded to the Commercial Aviation Safety Team (CAST) in 2012 and a Joint Safety Analysis and Implementation Team (JSAIT) was formed to examine the findings

and evaluate mitigations. While the JSAIT analysis was in progress, the ASIAS study on STAR operations was completed and the scope of the JSAIT was expanded to include mitigations for those safety issues. The JSAIT work culminated in recommendations that CAST adopt three new safety enhancements (SE) that apply to RNAV departures and STAR operations:

- *SE 212: Equipment and Procedures to Improve Route Entry for RNAV Departures.*
- *SE 213: Safe Operating and Design Practices for STARs and RNAV Departures.*
- *SE 214: Procedures and Standards to Improve Path Compliance for STARs and RNAV Departures.*

CAST recommends the adoption of the three SEs, which are cost-effective and beneficial in reducing the risks identified for RNAV departures and STAR operations.

