




Federal Aviation Administration

Memorandum

Date: **SEP 2 2015**

To: Jodi McCarthy, Director, Airspace Services, AJV-1

From:  Bruce DeCleeve, Manager, Flight Technologies and Procedures Division, AFS-400

Subject: Criteria for Area Navigation (RNAV) Standard Instrument Departures (SID)s that contain RADAR Vector Segments (Open SID Design)

Purpose: This memorandum authorizes RNAV SIDs with embedded RADAR vector segments.

Discussion: With the continued expansion of Performance Based Navigation, the Flight Standards Service, along with the Performance Based Aviation Rulemaking Committee (PARC), have studied the operational feasibility and aircraft capability with using an open SID design criteria. Open SID design criteria allows the use of Area Navigation (RNAV) departures with manual termination legs with the option to rejoin the RNAV route. Based on this study, open SID design criteria should be used only where operationally necessary to achieve airspace efficiencies.

Action: Apply the Vector SID Design criteria described in the attachment to this memorandum. The facility requesting to use Open SID design criteria must provide a justification memorandum to AJV-14. AJV-14 will coordinate with AFS-400 prior to approval.

Summary: This memorandum authorizes RNAV SIDs with embedded RADAR vector segments. These changes will be incorporated into the next revision to FAA Order 8260.58 which is planned to rescind FAAO 8260.53, *Standard Instrument Departures That Use RADAR Vectors to Join RNAV Routes*. If you have any questions, please contact Mr. Rick Dunham, Manager, Flight Procedure Standards Branch, AFS-420, at (405) 954-4164.

cc: AJV-5
AJV-14
AJV -C24
AJV- E24
AJV -W24

Attachment:
(1) Vector SID Guidance

Attachment 1. Open Standard Instrument Departure (SID) Guidance

A SID may be developed starting with or including a vector leg followed by an Area Navigation (RNAV) route.

When designing an RNAV route following radar vectors, establish the first waypoint as an Initial Fix leg (IF). No Obstacle Evaluation Area (OEA) construction or Distance Measuring Equipment (DME)/DME screening is required prior to the IF of the RNAV route being joined.

- a. The IF beginning an RNAV route must fall within an area and be at an altitude protected by either an Minimum Vector Altitude (MVA)/Minimum IFR Altitude (MIA) or Diverse Vector Altitude (DVA). The IF altitude may not be less than 500 feet above airport elevation. ATC must be consulted and consideration must be given to the time/distance required for RADAR identification and normal vectoring when designing the IF.
- b. A single RNAV course must be defined from the IF.
- c. The IF must be a fly-by (FB) fix. A track to fix (TF) leg must follow the IF. General OEA construction applies.
- d. The length of the first leg must be sufficient to accommodate a 90-degree turn at the IF. Use standard turn parameters, except a 25-degree bank angle applies. Where a shorter leg is needed, reduce airspeed in increments of not less than five Knots Indicated Airspeed (KIAS) until the desired length is achieved.
- e. Each SID is limited to one common route and must start with a single IF.
- f. A flat surface evaluation is conducted from the IF early Along Track Tolerance (ATT) to late ATT. A sloping Obstacle Clearance Surface (OCS) originates at IF late ATT. The OCS starting elevation is the MVA/MIA altitude minus Required Obstacle Clearance (ROC) or DVA OCS elevation. Where multiple MVA/MIA/DVA sectors apply (multiple airports, runways, etc.), the most demanding surface must be used. Climb gradients are not authorized as mitigation for obstacles that penetrate the OCS, the surface must be raised by increasing fix altitudes or redesigning the route.

A SID may start with an RNAV route that has a manual termination followed by vectors to join an RNAV route. Construct and evaluate the route off the runway using the applicable straight or turning criteria. No OEA construction or DME/DME screening is required between the fix beginning a manual termination leg and the IF of the RNAV route being joined.

- g. The RNAV route off the runway must terminate with either a Fix to Manual termination (FM) or Heading to Manual termination (VM) leg.
- h. An FM beginning with a FB fix is preferred. This combination encompasses the most operators.
- i. An FM that results in a turn must start with a FB fix.

- j. An FM that doesn't require a turn may be either a FB or fly-over (FO) fix.
- k. A VM must start with a FO fix.
- l. The fix beginning a manual termination leg must fall within an area and an altitude protected by either an MVA/MIA or DVA.
- m. For the RNAV route following the vector segment, comply with paragraphs a. thru f. above.