AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
October 29, 2013

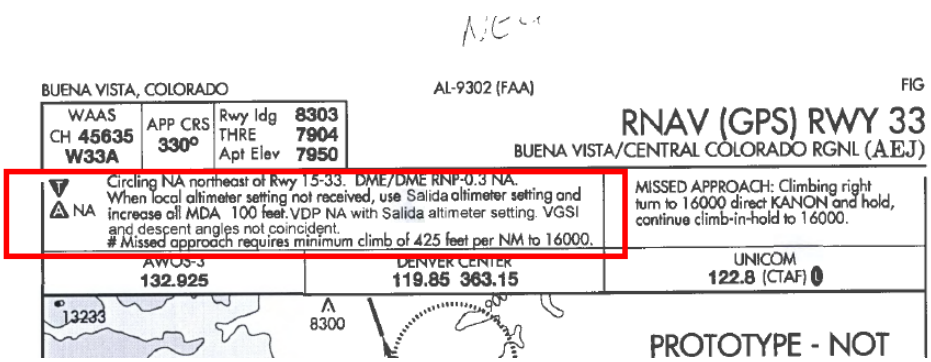
HISTORY RECORD

FAA Control # 13-02-314

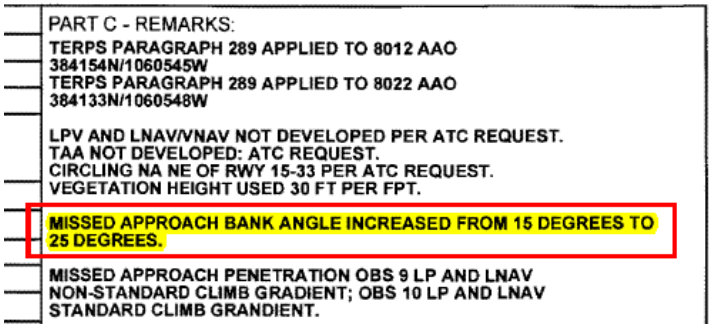
Subject: Bank Angle Requirements on Instrument Approach Procedures

Background/Discussion: FAA Order 8260.58, *United States Standard for Performance Based Navigation Instrument Procedure Design*, Volume 6, paragraph 1.2.1 prescribes the recommended bank angle (18 degrees) and the maximum bank angle (up to 25 degrees) used in the design of RNAV instrument procedures. In addition, Order 8260.58, Volume 6, paragraph 5.5, permits missed approach climb gradients in excess of the standard 200 ft./NM. Together, these two industry-supported options afford greater flexibility in RNAV procedure design. However, the application of both options in the missed approach segment may prove problematic for some lower climb performing aircraft.

NBAA provides the following example of a procedure recently posted to FAA's Coordination web site for Buena Vista, CO (AEJ) as an example of an approach that uses both a higher-than-standard climb gradient and a greater-than-18 degree bank angle requirement in the missed approach:



Unfortunately, the IAP does not inform the pilot that the missed approach segment was assessed using a 25 degree bank angle. This information is only available in the 8260 Form Package – Part C Remarks:



Steeper bank angles are normally not a concern when used with a standard climb gradient in the missed approach segment. However, on missed approaches using a higher-than-standard missed approach climb gradient, especially when it extends to a substantial height of airport elevation (e.g., Buena Vista, CO - 425'/NM to 16,000 ft.), pilots must consider the climb performance loss resulting from the steeper bank angle when evaluating their aircraft's capability to achieve the required climb gradient. For many turbine aircraft, the minimum maneuvering speed for configuration limits the bank angle to 15 degrees. The pilot must be aware of this information when selecting the appropriate missed approach climb configuration and minimum climb-out speed, both of which will greatly influence the all-engines-operating climb performance of the aircraft.

Recommendations: NBAA recommends that FAA amend Order 8260.19E adding a requirement to publish in the instrument approach procedure briefing strip the required bank angle used in the missed approach segment procedure when the value exceeds the recommended 18 degrees in FAAO 8260.58, Volume 6, paragraph 1.2.1.

NBAA further recommends that the FAA Aeronautical Informational Manual furnish guidance stating that the missed approach procedures may require bank angles up to 25 degrees in combination with higher than standard climb gradients. It should also include an advisory that pilots must evaluate the combination of bank angle, minimum maneuvering speed, and known aircraft performance in deciding whether to use the line-of-minima associated with the higher than standard climb gradient.

Comments: This recommendation affects:

- FAA Order 8260.19E, Flight Procedures & Airspace.
- Aeronautical Information Manual.

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Initial Discussion – MEETING 13-02: New issue presented by Rich Boll, NBAA, expressing concern over the use of increased bank angles in procedure design. He used the RNAV (GPS) RWY 33 approach at Buena Vista, CO, which specifies 25 degrees was used in the design; however, this information is not provided to the pilot. Rich is requesting that higher bank angles be published on the chart. Tom Schneider, AFS-420, briefed he had consulted with TJ Nichols, the AFS-420 staff specialist for RNAV criteria, who responded ( ) that the use of an increased bank angle should not have happened. A bank angle calculator was inadvertently included in Order 8260.58. This situation is being corrected by an AFS-400 memo; however, Tom was unsure whether it had been signed. Brad Rush, AJV-3B, asked what bank angle developers should use. John Frazier, Advanced Aircrew Academy, concurred that the chart does not specify the bank angle; therefore, in the absence of other guidance, pilots would apply what they normally use. Group discussion on bank angles and aircraft performance and climb

gradients ensued. Bruce McGray, AFS-410, stated that if a 25 degree bank angle is required, then it will have to be a demonstrated aircrew qualification. Rich stated that what he understands from the conversation is this was a fluke and should not happen again. Tom added there should never be a 25 degree bank angle requirement specified on an IAP. With this statement, Rich stated the issue may be closed. ITEM CLOSED.

Editor's Note: *The policy clarification memo mentioned above was signed by AFS-400 on November 4, 2013.*