

# AERONAUTICAL CHARTING MEETING

## Instrument Procedures Group

Meeting 19-02 – October 2019

### RECOMMENDATION DOCUMENT

FAA Control # 19-02-344

**Subject:** Intermediate Segment Stepdown Altitudes

#### **Background/Discussion:**

In 2011, FAA AFS 400 published a policy memorandum ([attached](#)) providing guidance for the locating the fixes used for ATC vertical separation purposes and glidepath intercept support regarding simultaneous operations. Paragraph 3 of the memo provided guidance for locating fixes on straight-in aligned procedure for ATC vertical separation purposes at locations where high temperatures induce premature descent. The purpose of this guidance was to ensure that fixes located on the intermediate segment of approaches supporting simultaneous operations could reasonably be expected to be at or below the ILS glideslope so that the aircraft could descend on the ILS glideslope and remain at or above the published intermediate segment step-down fix altitudes leading to the PFAF. This is in accordance with the safety risk findings supporting simultaneous parallel approach operations.

This policy memorandum was supposed to be incorporated into JO 8260.3 U.S. Standard for Terminal Instrument Procedures (TERPS). NBAA has learned that this did not occur, and further that the FPTs never applied this memorandum to any procedures then in development or currently deployed in the NAS. FAA did include a reference to the need to “consider” the effect of high temperature in the TERPS reference guidance on simultaneous independent approaches in Appendix E, paragraph 5.f.:

f. Approach design for fixes on the portion of the approach that is aligned with the FAC. **It is highly recommended that the high temperature algorithm (also called temperature compensation) be used when placing fixes on the FAC and extended FAC.** The advantage is to allow aircrews to make a stabilized descent, even on days with high temperatures. If the high temperature algorithm is not applied, on high temperature days the pilot might have to shallow out or even briefly level off to meet an altitude restriction instead of being able to follow the glide slope indication. However, since the algorithm results in the fixes being further out, there may be circumstances, such as airspace constraints, that preclude applying the high temperature algorithm. TERPs specialists should coordinate with the affected ATC facility.

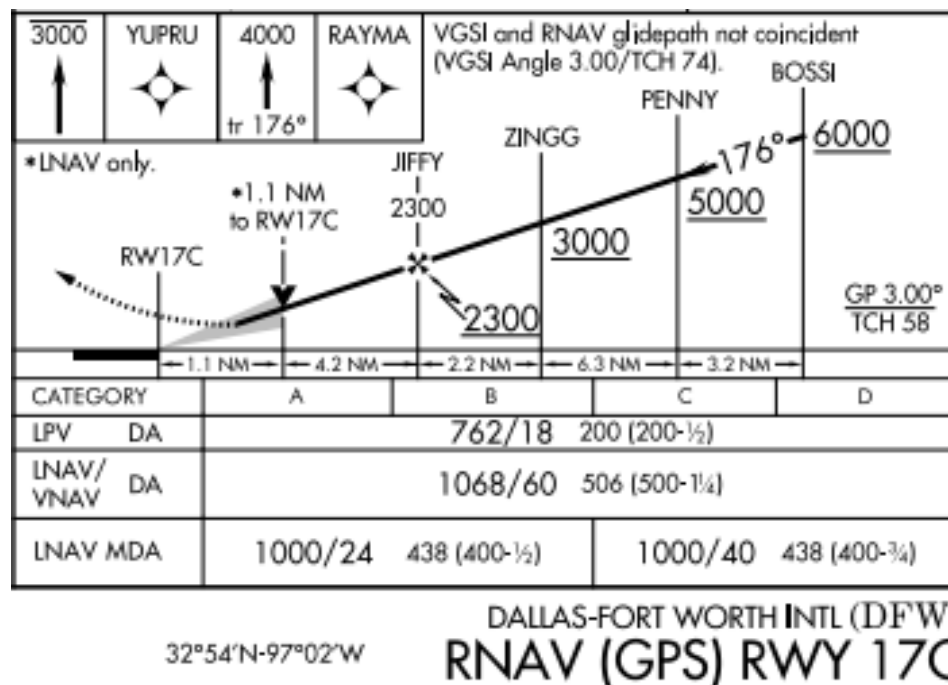
However, no algorithm is furnished in TERPS or any other FAA Order to the TERPS specialist for completing this analysis nor is it required that they do so.

The policy memorandum was issued as result of pilot altitude deviations occurring on the ILS approaches at Chicago O'Hare (KORD) to the newly commissioned runways. The memorandum was to ensure, obstructions and terrain needs notwithstanding, that an aircraft could descend on the ILS glidepath with reasonable confidence that it would remain above published intermediate stepdown fix altitudes.

NBAA has recently learned that certain WAAS-SBAS capable RNAV systems will begin using WAAS-SBAS vertical guidance starting at the Final Approach Course Fix (FACF), which is typically, but not always co-located with the intermediate fix (IF) on an RNAV approach. Since the WAAS-SBAS generated vertical path is not subject to hot/cold temperature effects as occurs with a barometric derived (Baro-VNAV) vertical path, the effects of hot temperatures on

compliance with the intermediate segment stepdown fix altitudes on these approaches is similar to an ILS glideslope, as illustrated by this example - KDFW RNAV(GPS) Rwy 17C:

- At 100°F, ZINGG is 200' above the WAAS-SBAS glidepath
- At 130°F (charted limit), ZINGG is 300' above WAAS-SBAS glidepath



An aircraft descending using VNAV, which is generated by WAAS/SBAS and not Baro-VNAV, and on the vertical path would cross below the published altitudes at PENNY, ZINGG and JIFFY if BOSSI is designated at the FAF in nav-database coding.

### Recommendations:

NBAA recommends that the policy memorandum be incorporated into JO 8260.3 U.S. TERPS and on approaches where LPV minima are published, in FAA Order 8260.58.

### Comments:

This request affects FAA Order 8260.3 and FAA Order 8260.58.

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**Date:** 9/16/19

**Initial Meeting 19-02:** Rich Boll, NBAA, briefed the new issue using slides. FAA recognized the temperature compensating altitude issue, and issued a policy memo in 2011. This memo was planned to be incorporated onto TERPS changes, however this did not happen, instead there was language added to the simultaneous approach operations guidance suggesting altitudes be compensated at locations with high temperatures, but the algorithm was never added to TERPS. Rich also stated there are errors in the algorithm that need repairs. The NBAA recommendation is to move the policy memorandum language into TERPS, and correct the algorithm. Some locations with this concern moved the impacted fixes farther out facilities to alleviate the problem. Gary McMullin, Southwest Airlines, pointed out there can be discrepancies in indicated altitudes between aircraft flying LPV or LNAV/VNAV vertical guidance on the same approach since the LNAV/VNAV glidepath is derived by barometric altimeter. John Collins, general aviation pilot, added pushing out the last fix some distance would help. Rich pointed out AIM changes might be required in the future, but would depend on Flight Procedures and Airspace Group decisions.

**Action Items:**

- FAA Flight Procedures and Airspace Group will review the 2011 policy memorandum and determine if it should be incorporated into Order 8260.3

**Status:** Item open

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**Meeting 20-02** Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue summary and current status from the [slide](#). A memo was published in 2011 to provide guidance for adjusting intermediate segment fix locations for high temperature effects. The memo advised that guidance would be placed in a future revision of FAA Order 8260.3, but this has not yet occurred. The plan at this point is to include it in a revision in the near future. Appropriate guidance will be included as an appendix to the order, and language currently referencing the 2001 memo will be revised to reference the appendix. Gary Fiske, FAA ATC Procedures (Terminal) Team, said as a result of the 2011 memo, KLAX ILS finals were revised to account for high temperature days by moving some fixes. John Blair, FAA Flight Operations Group (FOG), advised he and Joe Lintzenich, FOG, worked the situation in depth, and they found that over the years many locations had applied the memo guidance and support including the guidance in Order 8260.3. Rich Boll, NBAA, added this is also an RNAV issue, particularly for SBAS approach procedures. Jeff said they will ensure language in Order 8260.3 (and also Order 8260.58 if necessary) will point to the appendix. Paul Hannah, Lean Engineering, discussed that the PARC NAV WG has discussed similar capture fix issues, and Gary Petty, FPAG, said the changes would be coordinated as necessary to ensure there is no disconnect and would not have an unexpected negative effect on existing procedures.

**Action Items:**

- Flight Procedures and Airspace Group will brief the Order 8260.3 changes.

**Status:** Item open

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**Meeting 21-01:** Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue summary and current status from the [slide](#). The addition of the algorithm to Order 8260.3 has not been accomplished yet, but is planned for the next draft revision of the order. Jeff explained the intent would be to include the algorithm in an appendix, and reference usage in applicable points of Orders 8260.3 and 8260.58. Rich Boll, NBAA, asked if this would be optional or mandatory, and Jeff the plan is for the application to be optional. Rich added he is concerned about some users having issues and will want to see the language, indicating a non-concur would likely follow if the application was not mandated. He said the temperature adjustments are primarily used with simultaneous parallel independent approaches, and the vertical path has to be above the stepdown fix altitudes. He added that the stepdown fix altitudes must support intercepting the glideslope or an SBAS generated glide path. Jeff will have an off-line discussion with the Flight Operations Group, and may loop Rich in on the further discussion.

**Action Items:**

- Flight Procedures and Airspace Group will brief the Order 8260.3 changes

**Status:** Item open

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**Meeting 21-02:** Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue summary and current status from the [slide](#). A calculation methodology for this has been added into a new appendix for draft Order 8260.3E Change 2. There was a 2011 memo that explained the methodology, and that was refined slightly for inclusion with explanatory language added. Rich Boll, NBAA, discussed the original concern was step down fixes at the published glideslope crossing altitudes. On a warmer than standard day, an aircraft flying the ILS will cross the fix with an indicated altitude lower than the published altitude, which is problematic if the published altitude is required for separation on simultaneous parallel independent operations. Rich added at the last meeting it was briefed the application of the appendix was optional, not mandatory, and Jeff said it would remain that way. Rich felt this could set up pilots for deviations, but Jeff said in areas where this may factor, the procedure designers could consider revised fix placement using this methodology to mitigate the problem. Rich asked about any explanatory accompanying language for the draft appendix, and said they will comment during coordination on the draft. Jeff read the draft language for the draft appendix. Dan Wacker, FPAG, asked if Aeronautical Information Services (AIS) would include this in automation software, but Jeff had not had those conversations with them. Dan will reach out to AIS and discuss the matter.

**Actions:** The Agency will continue the coordination process on the draft order and report status at the next ACM.

**Status:** Item open

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**Meeting 22-01:** Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue ([slide](#)). There is a 2011 memo on crossing altitudes in intermediate segments, and it is now incorporated into Order 8260.3E, Change 2 as an appendix. Dan Wacker, FPAG, will discuss with Aeronautical Information Services and MITRE to determine if this capability will be added to TARGETS, adding there may be some confusion with cold weather adjustments.

**Actions:** FPAG will report on status of the order revision. FPAG will meet with Aeronautical Information Services and MITRE to determine if this capability will be added to TARGETS and will report on outcome of those discussions.

**Status:** Item open.

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