

AERONAUTICAL CHARTING FORUM
Instrument Procedures Group
Meeting 16-02 – October 25, 2016

RECOMMENDATION DOCUMENT

FAA Control # 16-02-328

Subject: Complexity of Speed Restriction Notes on SIDs & STARs

Background/Discussion:

Speed Restriction Notes (sometimes also referred to as Speed Constraint Notes) applicable to Standard Instrument Departures (SIDs) and Standard Terminal Arrivals (STARs) generally fall into one of two categories:

1. Speed Notes, in simple form, that apply to the entire procedure
2. Speed Notes, in simple form, that apply to a specific point-in-space (e.g. Waypoint, Reporting Point, Airspace Fix or Navaid)

This categorization was typical until the emergence and influence of Performance Based Navigation (PBN) concepts and capabilities expanded and began to influence the design of terminal procedures.

Likewise, Speed Restriction Notes were, at one time, typically simple which made them easier for pilots to understand and apply, as well as for aeronautical chart providers (government or commercial) to depict them in accepted and consistent forms.

While chart formats and depictions may vary from one chart provider to another, the content of such notes is common; in accordance with the official FAA procedure source document applicable to each SID or STAR.

It is well known that adherence to speed restrictions is of utmost importance to both air traffic controllers and to pilots. Pilots, using their aeronautical charts of choice or provided by their airline, fully expect charted speed restriction notes to be:

- a. prominently depicted and quickly located
- b. presented in a consistent form
- c. simple and easy to understand.

Chart providers understand pilot expectations and base their individual depiction specifications on an understanding of the nature and content of the speed restriction notes as contained on the official FAA procedure source documents.

Although chart providers may depict speed notes differently, an important common element is that the actual content or wording of the notes is not altered from the source document. This is done to ensure the information determined by the procedure designer is accurately provided to the pilot

When pilots encounter difficulty with a charted note on a particular SID or STAR, usually an all-important Speed or Altitude restriction note, they're most likely to be critical of the chart's composition, the depiction method used, or the placement of the particular note.

Chart providers listen and attempt to address their customer's concerns within limits and controls they have available. (*Refer to expectations a. and b. listed above*). While chart providers can affect changes and make improvements in depiction and/or composition of charted notes, they DO NOT have control over the actual content or verbiage of the official source-driven notes.

The subject of Speed Restriction Notes has gotten a great deal of attention lately and has been discussed in various industry groups. As a result of that work it's become evident that two of the three areas of concern are within the means of chart providers to address (*a. depiction and b. consistent placement*), however, the important third aspect (*c. simple and easy to understand*) requires specific action on the part of the FAA source providers; specifically the applicable criteria, guidance, and/or procedure design.

As evidenced by newer SID and STAR designs being implemented across the U.S. NAS, Speed Restriction Notes are becoming much more complex. Further complicating matters is that speed control methods used by ATC (in the form of charted notes) vary by local facilities across the U.S. The increased complexity and inconsistencies lead to additional concern and aggravation among professional pilots who operate in these different operational environments. It has also been reported that some pilots may interpret the same chart note differently. Ambiguity of meaning or operational intent of certain types of speed notes is another concern.

In addition to the circumstances described above, examples included below in the 'Comments' section are intended to illustrate the point that a new "third type" of Speed Restriction Note has emerged, described as follows:

3. Speed Notes, in complex and/or conditional form, which apply to an entire procedure

NOTE: It is this new, third type of Speed Note which has becoming prevalent and is the center of many recent complaints from professional pilots and related groups.

Recommendations:

1. Applicable FAA criteria and guidance covering the design, development and expected operational use of SID and STAR Speed Restriction Notes, especially those which apply to an entire SID or STAR and are complex and/or conditional, should be re-examined and amended to improve simplicity, ease of understanding and uniformity.
2. An effort should be made to review and address differences in the application and verbiage of procedure-level Speed Notes currently in use across the U.S. NAS. Notes which may be difficult to understand, or are similar in intent but inconsistently worded, should be amended for improvement.
3. A primary objective should be to develop Speed Notes which achieve necessary ATC objectives but which are written in a manner which is concise, consistent

and easy to understand, nationwide. An important aspect is to compose notes in such a way that they have the same unambiguous meaning to all pilots.

4. Recent research by Volpe NTSC indicates that pilots tend to categorize chart notes into two forms; those which require immediate action and those which are reference only. Speed Notes should be written with the understanding that, when published in the form of an “actionable” charted note, the primary intended users are pilots on the flight deck.
5. As FAA procedure source documents are amended, chart providers could develop and apply charting specifications for these so-called “third type” of complex procedure-level (“actionable”) Speed Restriction Notes - known to be of significant importance to both ATC and pilots - in order to depict them more prominently and consistently.

Comments:

The following examples of complex, conditional Speed Restriction Notes, applicable to the entire SID or STAR procedure, are offered to illustrate of the variety in the NAS.

- KMKE ACCRA2 RNAV SID
“Turbojet aircraft maintain 250 KIAS until advised by ATC.”
- KLAX FIXIT3 RNAV SID
“Maintain At or Below 250 KIAS unless otherwise directed by ATC.”
- KORD ORD2 SID
“All turbojet departures in all directions: Maintain 250 KIAS until advised by ATC.”
- KDFW DALL3 SID
“Maintain 240 KIAS until leaving 5000 feet.”
- KCVG BLGRS2 SID
“Turbojets accelerate to 250 KIAS until reaching 10000 feet. If unable, advise ATC.”
- KCLT ANDYS8 RNAV SID
“Accelerate to 250 KIAS, if unable, advise ATC. Upon reaching 10000 feet, accelerate to and Maintain, 280 KIAS. If unable, advise ATC”.
- KLAS SHEAD9 RNAV SID
“Rwys 1 L / R: Max 230 KIAS until BESSY.”
- KSEA KMORE4 RNAV SID
“Do not exceed 250 KIAS until passing KMORE.”
- KBOS REVSS3 RNAV SID
“Maintain At or Below 250 KIAS until BERRO.”
“Maintain At or Below 290 KIAS until HEWMO.”
- KCLT BARMY1 RNAV SID
“Charlotte/Douglas Intl only: Accelerate to 250 KIAS, If unable, advise ATC.”
“All Airports: Upon reaching 10000 feet, accelerate to and Maintain 250 KIAS. If unable, advise ATC.”
- KSEA HAWKZ5 RNAV STAR
“Turbojet aircraft descend via Mach number until intercepting 280 KIAS. Maintain 280 KIAS until slowed by the STAR.”
- KCLT PARQR2 RNAV STAR
“Descend via Mach number until intercepting 270 KIAS. Maintain 270 KIAS until slowed by the STAR or assigned by ATC.”

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INITIAL DISCUSSION – MEETING 16-02: Ted Thompson (Jeppesen) presented the new item, saying the notes have become more complicated. Historically, when a speed restriction applies to the entire procedure, Jeppesen located it next to the procedure title, intending to make it obvious. In the last several years more complicated notes have emerged, and even though they may apply to the entire procedure they have been placed in the briefing section due to size (not short and simple per Jeppesen charting conventions). Pilot deviations have occurred because pilots have missed seeing the notes or misinterpreted them. Jeppesen attempted to resolve the issue with a “floating notes” concept, but with modern zoom practices, these notes can still be missed, prompting users to request consistency in placement. A discussion on speed notes followed covering: wording of the notes (examples in the RD); pilot interpretation of the notes; consistent placement of the notes on charts; simplifying & standardizing how notes are created across the NAS.. The goal is to keep the notes short and succinct. Facilities write standard notes individually for their local operation, but this standardization is not carried throughout the NAS. Volpe Human Factors study work on pilots reading chart notes was discussed, showing pilots looking for “action” vs. “non-action” items. Tom Schneider (AFS-420) showed slides on the issue prepared by AFS-420, ([VIEW](#)) showing current policy on speed notes. Only one note on STARs in Order 8260.19 shown (result of PCPSI work) is now being incorporated. SID notes example slides were discussed, including jet vs. prop “splits”. Rich Boll (NBAA) discussed content vs. placement of note (need for standard and non-standard). Discussion followed on: procedure designers using very specific language; industry partners (users) requests for speeds from ATC; need for specific and consistent language; TERPS containment requirements for some speeds, and placing these at fixes (including work at the PARC PCPSI); speed restriction as part of original clearance; speed notes where not necessary; difference with speed notes vs. speed associated with a fix; possibility of eliminating speed as part of general note. Tom discussed the five recommendations from the RD: AFS-420 will take an IOU to work with ATC and look at policy language/guidance in Orders 8260.19 & 8260.46 for consistent notes and will review VOLPE report when released for consideration on chart notes.

Status: **Item open: AFS-420**

MEETING 17-02: John Bordy (Flight Procedure Standards Branch), briefed this issue has two parts: The first is related to departure procedures, which are governed by Order 8260.46. Draft changes to Order 8260.46G ([VIEW](#)) to help standardize speed notes have been added to the order which should be in external coordination shortly. STARs are partially governed by Order 8260.19; therefore, speed notes related to STARs will be

addressed within draft FAA Order 8260.19I with an expected publication of late 2018. Developments on both orders will be address at the next ACF-IPG.

Editor's note: Additional recommendations will be added from ACF-IPG new (closed) agenda item 17-02-332

Action: John Bordy will report on the status of changes to Order 8260.46G and 8260.19I.

Status: Item open.

Meeting 18-01: John Bordy (Flight Procedure Standards Branch) briefed FAA Order 8260.46G is out for external comment with some language changes. These changes will be in FAA Order 8260.19I (STAR policy), which has not been started yet (since effort is still on FAA Order 8260.19H change 2). The effort will be to provide similar language to FAA Order 8260.46, and provide a smaller set of specific examples on speed restriction notes.

Action: John Bordy will develop draft language for FAA Orders 8260.19 and 8260.46.

Status: Item open.

Meeting 18-02: John Bordy (Flight Procedures and Airspace Group) provided an update for the action to add language to FAA Order 8260.46 to help standardize the format for speed restriction notes for departures. John added such language to the order and the order should be published shortly. John also indicated he would draft language for inclusion within FAA Order 8260.19 to assist in standardizing speed restriction notes applicable to STARs and approach procedures.

Action Item: John Bordy will report on the status of Orders 8260.19 and 8260.46 additions.

Status: Item open.

Meeting 19-01: John Bordy, Flight Procedures and Airspace Group, briefed the issue directly from the [slide](#): discussing a summary and current status. John Bordy mentioned speed restriction notes examples were amended within the recent publication of Order 8260.46G (applicable to departures), but that he still needs to add standardized examples to draft Order 8260.19I before it enters external coordination.

Action Item: John Bordy will work on draft Order 8260.19I and report on status.

Status: Item open.

Meeting 19-02: John Bordy, FAA Flight Procedures and Airspace Group, briefed the issue summary and current status from the [slide](#). Order 8260.46G was published in November 2018 with changes to speed restriction notes for SIDs. John identified two different methods for notes in Order 8260.19, and corrected those in the draft of 8260.19I. Flight Procedures and Airspace Group will report on the status of 8260.19I at the next meeting, and will anticipate closing the issue at that time. Lev Prichard, Allied Pilots Association, asked if there would be specific examples of notes in the orders, and John said Flight Procedures and Airspace Group would look into that. Lev would like to identify examples of notes he would like changed, and Gary McMullin, Southwest Airlines would like to identify examples of notes he would like eliminated. Lev and Gary will both look at examples in Order 8260.46G, provide examples of notes they would like to have revised or removed, and will email any suggestions to Flight Procedures and Airspace Group to forward to the order POC.

Action Items:

- FAA Flight Procedures and Airspace Group will report status of Order 8260.19I
- Lev and Gary will forward to Flight Procedures and Airspace Group suggested changes for Order 8260.46G

Status: Item open.

Meeting 20-02: Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue summary and current status from the [slide](#). Lev Prichard, Allied Pilots Association, thinks this result failed to accomplish the goal, and he will send examples to Susan Walker, FPAG and include Gary McMullin, Southwest Airlines. Jeff said Order 8260.19I Section 4-5 has speed notes for STARS, and Order 8260.46 contains the criteria for SIDs. Lev said these notes need to match; any identified issues should be coordinated with Diane Adams-Maturo, FPAG. Dan Wacker, FPAG, said the issue of chart notes for SIDs is being looked at in the Departure Working Group in an effort to reduce note clutter, but actual changes on charts could take many years to propagate. Gary agreed saying these speeds are on the charts as notes rather than it being a database issue, and those notes tell the pilot to do what they will do anyway and can be missed.

Action Items:

- Lev Prichard and Gary McMullin will send examples to and work with Diane Adams-Maturo and Susan Walker, Flight Procedures and Airspace Group for notes in Orders 8260.19 and 8260.46 notes.
- FAA Flight Procedures and Airspace Group will ensure changes in Order 8260.19 are consistent with work the Departure Working Group is doing with SIDs.

Status: Item open.

Meeting 21-01: Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue summary and current status from the [slide](#). Order 8260.19I was published June, 2020. There were no examples received following ACM 20-02 for suggested changes to order 8260.46 verbiage. Lev Prichard, Allied Pilots Association, said speed restriction notes should be facility specific and not too verbose. Gary McMullin, Southwest Airlines, said there is a lot of confusion and no limits on notes, and for SIDs he would prefer examples be reviewed in a small working group with Lev and others. Lev agreed with Gary, and thought this should be a PARC PCPSI discussion to include pilots, with feedback brought back to the ACM. Doug Willey, Airline Pilots Association, added an example at DEN that caused a lot of confusion, and others brought up additional examples. The group suggested the Departure Work Group (DWG) would be a good place to address these concerns. Dan Wacker, FPAG, commented there is an open item in the DWG on ATC notes with an interest in reducing the number of notes on procedures, and this would fit well there. Dan suggested the DWG bring the work to the PCPSI for pilot feedback, then back to the DWG for criteria changes. Rich Boll, NBAA, agreed this should be discussed in a larger group, and that the DWG would work well. Lev added there is an upcoming PCPSI WG, and Dan added they have time already scheduled to discuss these items at that meeting and bring back to the DWG.

Action Items:

- Flight Procedures and Airspace Group Departure Working Group (DWG) will work on examples and specifics, take to the PARC PCPSI, then return to the DWG for criteria work
- FPAG will brief status at ACM 21-02

Status: Item open.

Meeting 21-02: Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue summary and current status from the [slide](#). Dan Wacker, FPAG, briefed that the Departure Working Group (DWG) held discussions with the group that introduced the original recommendation document. Dan and Sue Walker, FPAG, are drafting revised criteria, and will brief the draft language at the ACM when completed. Draft language will be shown at the PARC Pilot Controller Procedure and System Integration Work Group (PCPSI) for their review if possible, and Dan would like to share draft language with industry groups prior to the next ACM.

Actions: The Agency will continue work, brief the PARC PCPSI, and report progress at the next ACM.

Status: Item open.

Meeting 22-01: Dan Wacker, FAA Flight Procedures and Airspace Group (FPAG), briefed the Departure Working Group (DWG) is working through the concerns with speed restriction notes. Dan will put some examples together, then reengage with the PARC PCPSI one more time. Dan will report the progress at the next ACM. The item will remain open.

Actions: FPAG will reengage with the PARC PCPSI and report on discussion results and any potential criteria revisions results from that discussion.

Status: Item open.

Meeting 22-02: Jeff Rawdon, FAA Flight Procedures and Airspace Group (FPAG), briefed the issue summary. The original recommendation document (RD) had several recommendations for a variety of speed restrictions. The remaining action was for FPAG to reengage with the PARC PCPSI on any potential criteria changes. Dan Wacker, FPAG, briefed that the Departure Working Group (DWG) met with the PARC PCPSI and agreed to make changes to some standard chart notes on SIDs and STARs. The FPAG will incorporate those changes into the orders in an upcoming revision. A couple of items (radius-to-fix (RF) turns and speed restrictions) will go back to the PARC for some clarification prior to inclusion in the draft orders. Jeff suggested we close the issue, and there were no objections.

Status: Item closed.