

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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