Instrument Departure Update

The FAA is merging SIDs and IFR departure procedures into a common system.

By Wally Roberts

THE FAA RECENTLY MERGED SIDS and IFR departure procedures into a common system. As of January 1, 1998, SIDs and IFR departure procedures were both replaced by Instrument Departure Procedures ("DPs"). Complex textual departure procedures (today's complex IFR departure procedures) will be converted to graphic, charted procedures on an evolutionary basis. While the system officially changed on January 1, it will take a while for these things to play catch up in today's FAA. These changes were prompted by the crash of a U.S. Air Force C-130 during departure from Jackson Hole, WY in 1996.

In this article, I'll provide an overview of this significant change, and discuss how some confusion might creep into the system until the bugs are worked out. In an ideal world, we wouldn't be faced with new confusions as an ambiguous system is replaced, but that is not the reality of today's understaffed FAA. This article will also provide a basic overview of the operational ground rules for departing IFR from an IFR airport (an IFR airport has one or more standard instrument approach procedures).

In "Graphic IFR Departure Procedures" (February, 1997 *IFRR*), I discussed my vision for an improvement in IFR departure procedures, where I proposed that complex IFR departure procedures be graphically charted. To the credit of FAA staff, not only did they see the wisdom of this, they decided to consolidate the design and production of SIDs and IFR departure procedures.

The user group I work for had long advocated the design and production of SIDs and STARs be accomplished by the same FAA organization that designs and produces airways, instrument approach procedures, and IFR departure procedures—the National Flight Procedures Office (NFPO) in Oklahoma City. As of January 1, the NFPO assumed responsibility for all new and revised DPs.

SID vs IFR departure procedure

Historically, SIDs were developed to provide optimum IFR departure traffic routes for ATC management of air traffic, whereas IFR departure procedures were developed to provide terrain and manmade obstacle clearance at airports that aren't clear of a 40:1 departure slope in all directions. Some IFR departure procedures are as simple as, "All departures, climb west of airport until leaving XXX altitude" (to avoid a tall tower to the east) or, at many mountain area airports, they are a complex departure route.

These changes were prompted by the crash of a U.S. Air Force C-130 during departure from Jackson Hole, WY in 1996.

Because SIDs were considered "canned" ATC departure route clearances, they have been charted graphically from their inception. IFR departure procedures, however, had a quite different origin and (prior to the USAF Jackson Hole crash) the FAA didn't see a need for a graphical presentation of complex IFR departure procedures. In other words, SIDs were a canned method of ATC telling the pilot how to depart an airport for traffic separation and flow purposes. Whereas, IFR departure procedures were developed by FAA procedures pilots to advise pilots how to safely depart airports having obstacle problems.

ATC established SIDs wherever traffic warranted, regardless of whether there was a departure obstacle problem. FAA procedures pilots would review the SIDs to ensure they didn't present an obstacle clearance problem, but there was no real effort at national standardization or quality control. SIDs were developed by regional ATC staffs, who were primarily controllers and who usually had little, if any, knowledge of TERPs standards. There was a rudimentary form of national guidance for the design of SIDs in an air traffic order.

Only official word so far

The following is the complete text of the long-term FDC Notam that announced the January 1 change. It will take a while for this to be included in the AIM because the AIM has a long publication lead time these days:

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  !FDC 8/0093 FDC PART 1 OF 2
  .......INSTRUMENT DEPARTURE
PROCEDURES (DP'S).......
  EFFECTIVE JANUARY 01, 1998
ALL EXISTING TEXTUAL DEPAR-
TURE PROCEDURES AND STANDARD
INSTRUMENT DEPARTURES (SID)
WILL BE REDESIGNATED AS IN-
STRUMENT DEPARTURE PROCEDURES
(DP'S). PROCEDURALLY, THERE
WILL BE NO CHANGES TO THE USE
OF GRAPHICALLY PUBLISHED DP'S
(FORMER SID'S) OR THEIR NAMES.
  FOR TEXTUALLY PUBLISHED
DP'S, WHEN COMPLIANCE WITH THE
PROCEDURE IS NECESSARY FOR
TRAFFIC SEPARATION, ATC WILL
ISSUE: "DEPART VIA (AIRPORT
NAME) (RUNWAY NUMBER) DEPAR-
TURE PROCEDURE." AS PART OF
THE ATC CLEARANCE. THE "T"
ICON ON INSTRUMENT APPROACH
PROCEDURE CHARTS WILL CONTINUE
TO INDICATE THAT NONSTANDARD
IFR TAKEOFF MINIMUMS AND/OR
TEXTUAL DP'S ARE PUBLISHED FOR
THAT AIRPORT. TEXTUAL DP'S
PROVIDE OBSTACLE CLEARANCE.
  PART 1 OF 2
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!FDC 8/0093 FDC PART 2 OF 2 IN THE ABSENCE OF A DP IN THE ATC CLEARANCE, PART 91 OPERATORS ARE ENCOURAGED TO USE THESE PROCEDURES DURING IMC AND/OR NIGHT OPERATIONS.

BEGINNING WITH THOSE PUBLISHED AFTER 01/01/98, ALL NEW RNAV DP'S WILL BE PUBLISHED GRAPHICALLY. EXISTING TEXTURAL [sic] DP'S WILL BE REVIEWED INDIVIDUALLY AND, WHERE APPROPRIATE, PROCESSED FOR GRAPHIC DEPICTION. THIS NOTAM DOES NOT AFFECT ANY FAR OR AIR CARRIER OPS SPEC.

PART 2 OF 2

Significant ommission

What's missing from this NOTAM? The significant omission is a lack of guidance about which DP you can use without a specific clearance when ATC doesn't assign a DP, yet you want to ensure terrain clearance. This isn't a problem when an airport has only one DP or no DP at all.

What about an airport, however, with several DPs and a part-time tower? For example, it's late at night and the Center clears you into the en route structure without any departure routing. If the NOS approach chart(s) doesn't have a "T" symbol, you're home free, because you can make a diverse departure that suits your fancy. (The comparable Jepp chart will have no climb gradients or higher-than-standard takeoff minimums associated with any runway.)

In the early stages of this new program, the old departure ground rules will effectively apply, because the IFR departure procedure will still be textual and the SIDs will still be marked "SID." But, as time marches on, complex airports, especially complex mountain-area airports will have all departures charted and they all will be DPs. There was a movement afoot during the development of this new program to place a "D" icon on the charted DP that could be used for obstacle clearance when ATC did not assign a DP for traffic purposes.

The "D" concept is apparently dead, but there will probably be a scheme where the non-ATC DP will be referred to by title in the place where the textual IFR departure procedure once appeared, such as "TETON TWO." At this airport, if there is more than one DP, you'll know the TETON TWO is yours to use, (or not) at your option, when ATC doesn't clear you via a charted DP. Of course, if a textual DP still appears in the old familiar place, that's the DP you can use in the absence of a DP in your ATC clearance.

Most small airports will have only one DP if the airport isn't 40:1 clear in all directions. In this case, there will be no ambiguity, other than ATC may assign this sole DP on occasion, thus making its use mandatory. *Commercial* operators must use a DP when one is published (whether textual or charted) and no DP is assigned by ATC, unless there is special dispensation in the operations specifications for VFR climbs under specified weather conditions.

At an airport with multiple DPs, if no DP is included in your ATC clearance (as careful as you want to be in using the appropriate DP for terrain clearance), use the DP that is either textual or referred to by chart name where the textual description would otherwise be. This will keep you from flying one of the other DPs that are reserved for use by ATC assignment, and which might even require radar vectors to complete (and where the required approach control radar might be shut down for the night). I realize this seems convoluted, but it's the result of a lack of coordination of the process with the working ATC folks. I suspect the system will work it through eventually, but I'm providing a word to the wary in the meantime.

Departure fundamentals

Let's review the basics of departures under the new system:

1. An airport without a "T" (NOS) on its approach chart(s) has standard (FAR 91.175(f)) commercial takeoff minimums and no restriction to diverse departures. Unless ATC places a departure restriction in your clearance, you're free to proceed in a direct manner to your first en route fix, but don't turn until at least 400 feet above field elevation. (The comparable Jepp airport diagram will have only standard and air carrier lower-than-standard takeoff minimums and no textual departure instructions and no reference to a charted DP.)

2. At an airport with more than one DP, the takeoff minimums shown for a runway apply to all DPs, except where a DP contains its own charted takeoff minimums.

At an airport with multiple DPs, if no DP is included in your ATC clearance,use the DP that is either textual or referred to by chart name where the textual description would otherwise be.

3. If no climb gradient is specified, a minimum of 200 feet per nautical *ground* mile is presumed to apply.

4. A runway that shows "NA" for IFR takeoff cannot be used by commercial operators for IFR takeoffs. A FAR 91 operator should also avoid using such a runway for IFR departure except under good visual conditions.

5. Takeoff minimums, whether standard, lower-than-standard, or higher-than standard, legally apply only to commercial operations. As a matter of safety, a FAR 91 operator flying a poor climb performance aircraft should adhere to higher-than-standard minimums unless it's a severe-clear day.

Visual climb recommended

6. Most runways that have higher-than-standard takeoff minimums also have standard (and lower-than-standard) takeoff minimums, provided a specified climb gradient can be met. If the climb gradient cannot be met, the airport should be circle-climbed visually until the aircraft crosses the de-

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parture end of the runway at the specified higher-than-standard ceiling height. This will ensure the generic 200-foot-per-mile climb gradient will clear terrain from that point forward in the DP. Circle-to-climb at an unfamiliar airport should only be done in fairly good visibility, daytime conditions.

7. When ATC assigns a DP with a specified climb gradient, compliance with the climb gradient is mandatory. A higher-than-standard ceiling and visibility cannot be used in lieu of the climb gradient in such an assigned DP. (Exception: ATC assigns the textual DP or charted DP referred to where the textual DP would otherwise be. In this case, ATC has assigned the DP associated with the optional higher-than-standard, non-climb gradient minimums. If you need to circle the airport visually because of lack of climb performance, obtain ATC concurrence to so do.)

8. If a DP requires a turn of more than 15 degrees, and no turning fix, point, or altitude is specified, the turn should begin when the aircraft passes through 400 feet above field elevation. With long runways or good-performing aircraft, this turn can be made prior to the runway end during IMC. During VMC, don't turn before the airport boundary unless instructed by ATC at a tower-controlled airport.

9. Some runways do not have standard or lower-than-standard takeoff minimums because of close-in obstacles that cannot be safely overflown in IMC with a climb gradient. The takeoff minimums on the Jeppesen chart below shows such an example. Commercial operators are bound by such a minimum and cannot substitute ops specs for lower takeoff minimums.

Early turn requirement

10. Some runways have a mandatory "early turn" requirement because of close-in obstacles, i.e., the turn should be commenced at less than 400 feet above field elevation. In such case, the takeoff minimum will be at least 400-1 and the early turn shall be expressed as a turn to a heading or to intercept a course as soon as *practicable*. The word "practicable" is supposed to be used only in this context, but years of poor quality control over both SIDs and even IFR departure procedures will find the word used when a turn is not intended below 400 feet. Variations on improper word usage in this context include "as soon as practical," "immediate turn," etc. If the takeoff minimums are standard, you shouldn't turn below 400 feet, especially when IMC.

When to challenge

11. If ATC assigns a DP with a charted climb gradient, and ATC subsequently deletes the climb gradient in a mountainous area, challenge such a clearance with a polite question about whether ATC is providing terrain clearance backup by radar monitor of your flight.

12. If an airport has no charted public instrument approach procedure, it has neither been surveyed for departure obstacles, nor is it legal for a commercial operator to depart under IMC from such an airport unless the operator's ops specs have a special procedure for the airport.

A FAR 91 operator can legally depart IFR into IMC from such an airport, but is solely responsible for obstacle clearance. If any part of such a departure operation will occur within controlled airspace, the pilot must obtain a clearance to enter controlled airspace under IFR. (Note: when a FAR 91 operator improvises a departure procedure, he/she must not only be concerned about entering controlled airspace, he/she must also not level off until compliance is assured with the en route altitude requirements of FAR 91.177(a)(2).)

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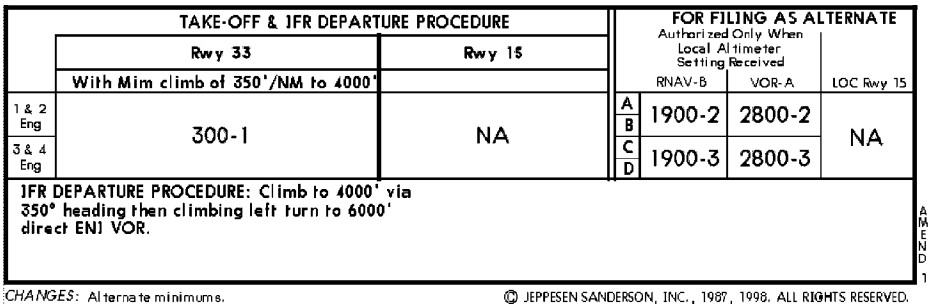

TAKE-OFF & IFR DEPARTURE PROCEDURE			FOR FILING AS ALTERNATE Authorized Only When Local Altimeter Setting Received		
	Rwy 33	Rwy 15	RNAV-B	VOR-A	LOC Rwy 15
	With Mim climb of 350'/NM to 4000'				
1 & 2 Eng	300-1	NA	A 1900-2	2800-2	NA
3 & 4 Eng			B		
			C 1900-3	2800-3	
			D		

IFR DEPARTURE PROCEDURE: Climb to 4000' via 350° heading then climbing left turn to 6000' direct ENJ VOR.

AMEND 1

CHANGES: Alternate minimums.

This airport doesn't have standard or lower-than-standard takeoff minimums because of close-in obstacles that cannot be safely overflown in IMC with a climb gradient. IFR takeoffs on Runway 15 aren't allowed for commercial operators and FAR 91 operators should follow suit.

Author's Note

A major change in charting concepts affects not only FAA policy, but inter-governmental charting specifications as well. After writing this article, I've learned that movement within various affected government agencies is now leaning toward calling all departure procedures Standard Instrument Departures (SIDs) instead of "DPs." This would keep the naming convention in harmony with the rest of the world.

The SID that serves the obstacle-clearance purpose of the former IFR departure procedure is now proposed to be called "Obstacle SID" when charted. If it's a "simple" obstacle SID that isn't deemed sufficiently complex to be charted, the textual description will continue to appear in the same location in both Jeppesen and NOS charts as do present IFR departures. Stay tuned!