

IFR TAKEOFFS AND LANDINGS

The newly revised FAR 91.175 outlines the operating rules for these two critical phases of flight. Be sure you know where you stand before you launch.

by Fred Simonds

It's one thing to read a regulation; it can be something quite else to apply it. The newly-revised FAR 91.175, Takeoff and Landing Under IFR, is just such a rule. Let's see if we can help you bridge the gap between the less-obvious aspects of this regulation and its application.

Making a Decent Descent

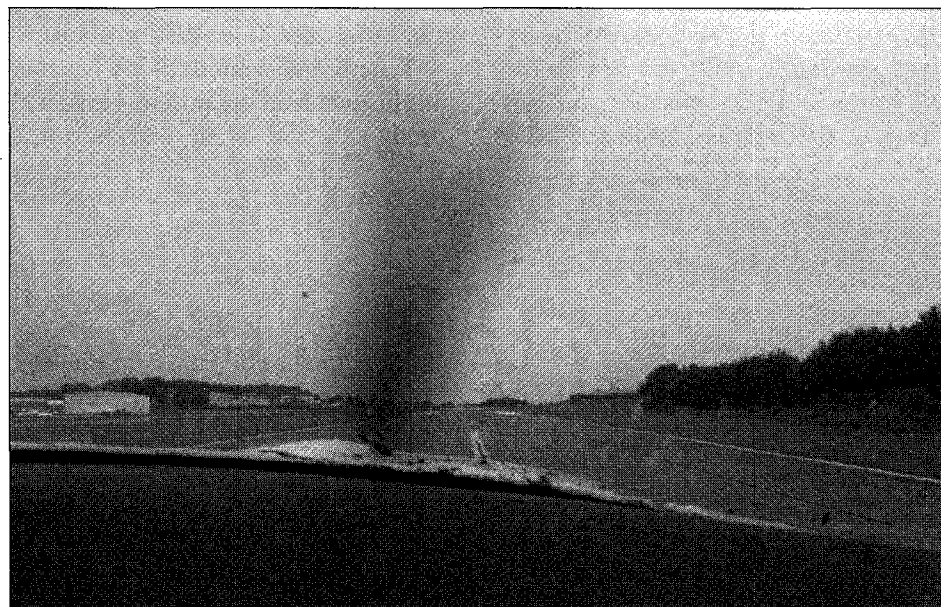
In order to descend below minimum descent altitude (MDA) or decision altitude/decision height (DA/DH), the rule says that the aircraft must be "continuously in a position from which a descent to a landing on the intended runway can be made at a normal rate of descent using normal maneuvers." How do we apply that rule, especially when the missed approach point (MAP) is near or at the runway threshold?

Instrument students frequently confuse MDA and MAP. We descend to MDA while looking for visual references. Every approach has required flight visibility. If you can't see a reference from a mile out or whatever the visibility figure is, then you must fly to the MAP and then execute the published missed approach.

Some approaches offer help in the form of a visual descent point (VDP), denoted by a boldface V in the approach profile view. Advisory in nature, the VDP is a DME fix that indicates where the lowest MDA for the approach joins a three-degree descent to the runway. If you cannot

see the runway environment at the VDP, a missed approach is in your future because you will need an excessive descent rate to make the runway thereafter.

You can calculate your own VDP based on distance or time. To get dis-



tance, subtract the touchdown zone elevation (TDZE) from the MDA or use the height above touchdown (HAT) from the approach plate and divide by 300. The result is the VDP's distance from the runway. For more information, see "Can You Fly a CANPA?" in the November 2008 issue of *IFR Refresher*.

Flight Visibility and Approach Light Systems

You will recall that an approach light

system is a functional component of an ILS (AIM 1-1-9). Seeing these lights can also be necessary for a pilot to comply with FAR 91.175, so it's important to know what you're looking for. You can find descriptions of the lighting systems including their expanded acronyms in your NACO or Jeppesen approach plate books, and also in AIM 2-1-1.

First, approach lights can help you determine flight visibility. ALSF-1, ALSF-2, MALSR and SSALR systems all begin either 2,400 or 3,000 feet from the runway threshold with a string of white runway alignment indicator lights (RAILs) denoting the extended runway centerline at 100-foot intervals for ALSF and 200 feet for MALSR and SSALR. The 2,400-

foot distance is more common and is used where the glide slope is 2.75 degrees or greater. Sequenced flashing lights, popularly termed the "rabbit," alternate with the RAILs. The flashers may be off if the visibility is good or because a pilot has asked the tower to "kill the rabbit."

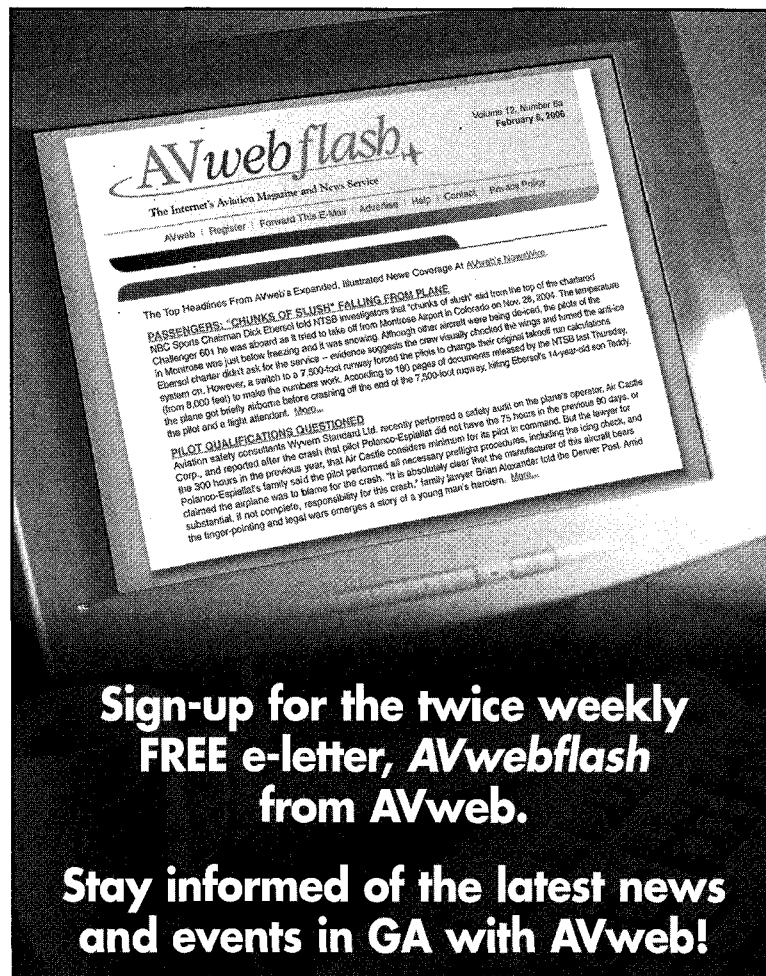
Therefore, if you arrive at the first RAIL and you can see the runway threshold, such as the red runway terminating bars or the white flashing runway end identifier lights (REILs),

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you have at least the 2,400-foot runway visual range (RVR) or half-mile visibility required for most ILS approaches, and you comply with 91.175's flight visibility requirement. The RVR to visibility conversion table can be found in your approach procedures booklet.

All U.S. approach light systems except ODALS have a white row of lights at right angles to the RAILS and flashers called a decision or roll bar located 1,000 feet from the runway threshold. The roll bar offers you a ready reference to the horizon and helps prevent disorientation as you shift from instruments to visual flight.

Even better, the roll bar can also help you gauge in-flight visibility. If the approach has a middle marker, it will be about 3,500 feet from the threshold. Passing the marker, look for the roll bar. If you can see it, then you have at least 2,500 feet of flight visibility, again meeting the requirement for most ILS approaches.

If you can see beyond the roll bar, then you have an additional 100 feet of visibility per ALSF row, or 200 feet per row for other lighting systems. ODALS alone has no roll bar and its five flashers are spaced 300 feet apart.

Other lighting systems include MALS, MALSF, SSALS and SSALF, which are 1,400 feet long. ODALS and SALS/SSALF are 1,500 feet long. Since the lowest visibility minimum for Category I approaches is 1,800 RVR, these systems are of limited value in estimating flight visibility.

One of the more confusing provisions of FAR 91.175 is section (c)(3). This section permits descent below DH/DA or MDA if the approach lights are in sight, but not below TDZE + 100 feet unless the red terminating bars or the red side row bars are in sight.

This section refers only to ALSF. Only ALSF-1 lighting systems have

red terminating bars. They are placed just before the green threshold lights used by all approach light systems. Likewise, only ALSF-2 systems (which are far more common) have red side row bars placed along the last 1,000 feet before the threshold to the left and right of the centerline lights between the roll bar and the green runway threshold lights.

If you are shooting an approach with another lighting system, then you simply need to be able to identify one of the other nine visual references in order to descend. Lacking red bars, the plus-100 foot restriction cannot apply—if it did, we could never land.

The rule also requires a missed approach if the flight visibility falls below that required. Alert pilots continue to monitor RVR as able until landing is assured. At airports with jet traffic, if one jet can depart, its heat

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exhaust may evaporate enough mist to raise the RVR temporarily. This can work for or against us: a succession of jet departures may help us get in, but if the departures cease, the RVR may sink below minimums and force a missed approach.

Cloud density can also force a missed approach if the clouds become thick enough to obscure ground references. Do not assume that legal conditions will persist all the way to touchdown. Be mentally prepared to fly the missed approach if conditions deteriorate quickly.

While tangential to our discussion of FAR 91.175, the downward visibility you need is obscured by your airplane's cowling, glareshield and your seat position. It is worthwhile to practice some ILS approaches at runways with approach light systems to discover how far you can see ahead and below you at decision height.

Moving your seat as far forward as you comfortably can gives you an extra edge. This lends new meaning to "being on the edge of your seat."

Obstacle Departure Procedures

The new FAR 91.175 refers specifically to obstacle departure procedures (ODPs) for the first time. Though not applicable to Part 91 operators, you can fly them without ATC approval and you add safety by following ODPs when published.

To illustrate, an ODP calls for a climb in a hold to 3,500 feet before turning on course to the north. The pilot turns directly north after takeoff and strikes a mountain. It's worth

reading the fine print to avoid this sort of tragedy.

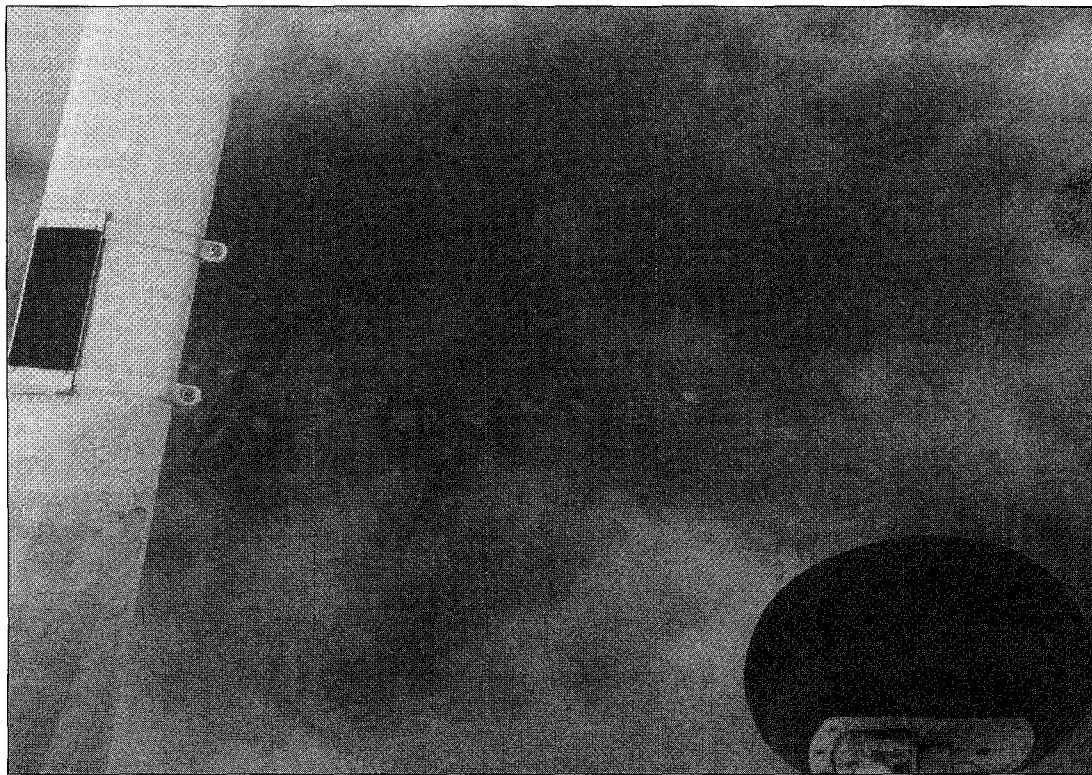
It may seem odd to seek out the approach plate for the airport you are departing, but the telltale "T" indicates whether to look for nonstandard takeoff minimums and ODPs.

ODP takeoff minimums often say something like "300-1 or standard with a minimum climb of 460' per NM to 500." The reference to "standard" can be obscure. It means that the visibility for non-Part 91 operators must be one statute mile for aircraft with two engines or less and one-half

and thus such departures are legal, if perhaps unwise.

As the Procedure Turns

Finally, there is the ever-confusing limitation on procedure turns. These are not permitted when conducting a timed approach from a holding fix or when the procedure specifies "NoPT." The confusion comes when being vectored to a final approach course or fix. In a much-heralded case in Maryland (see "Vague Vectors," *IFR Refresher*, March 2008), a pilot correctly executed a procedure turn the controller did not



mile for aircraft with more than two engines.

One of the unresolved contradictions in the regulations is how it can be legal to depart a non-towered airport under IFR in Class G airspace in zero-zero conditions. Class G airspace rules call for a mile and clear of clouds. Yet FAR 91.175 makes zero-zero departures for Part 91 operators legal by absence of any IFR rule to the contrary. As best I can determine, 91.175 takes precedence over the Class G rule

expect because he was not given explicit or even implicit instructions that he was cleared straight in. Since this little dust-up I now ask the controller just to be sure. I performed a similar approach twice within two hours. The first controller said the PT was my choice, and the second said he expected me to do the turn. Go figure.

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