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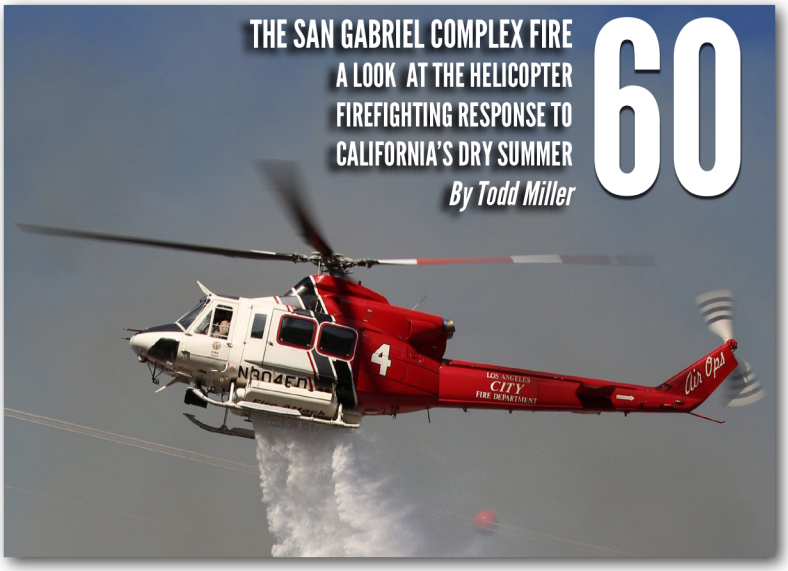

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COLUMNS & FEATURES

Instrument checkrides

are some of the most stressful exams applicants will undergo. There is an entire set of new rules (regulations) that the applicant must have absorbed. This, in addition to the nuances of learning to fly a helicopter strictly by reference to instruments, can make the instrument rating exam challenging for many. Like any checkride, being "over-prepared" is a huge key to a successful outcome for the applicant.

When it comes to IFR Regulations one of the most misunderstood items that applicants struggle with deals with 91.175 "Take-Off and Landing under IFR." This is one of those regulations that any instrument applicant or instrument pilot for that matter must know very well.

This is the particular provision that gives us guidance on when we can land under IFR, the "elements required" if you will. Essentially there are three elements required to continue below a specified altitude and land. You must have these elements at the respective MDA (minimum descent altitude) or the DA (Decision Altitude), or you can plan on executing a missed approach.

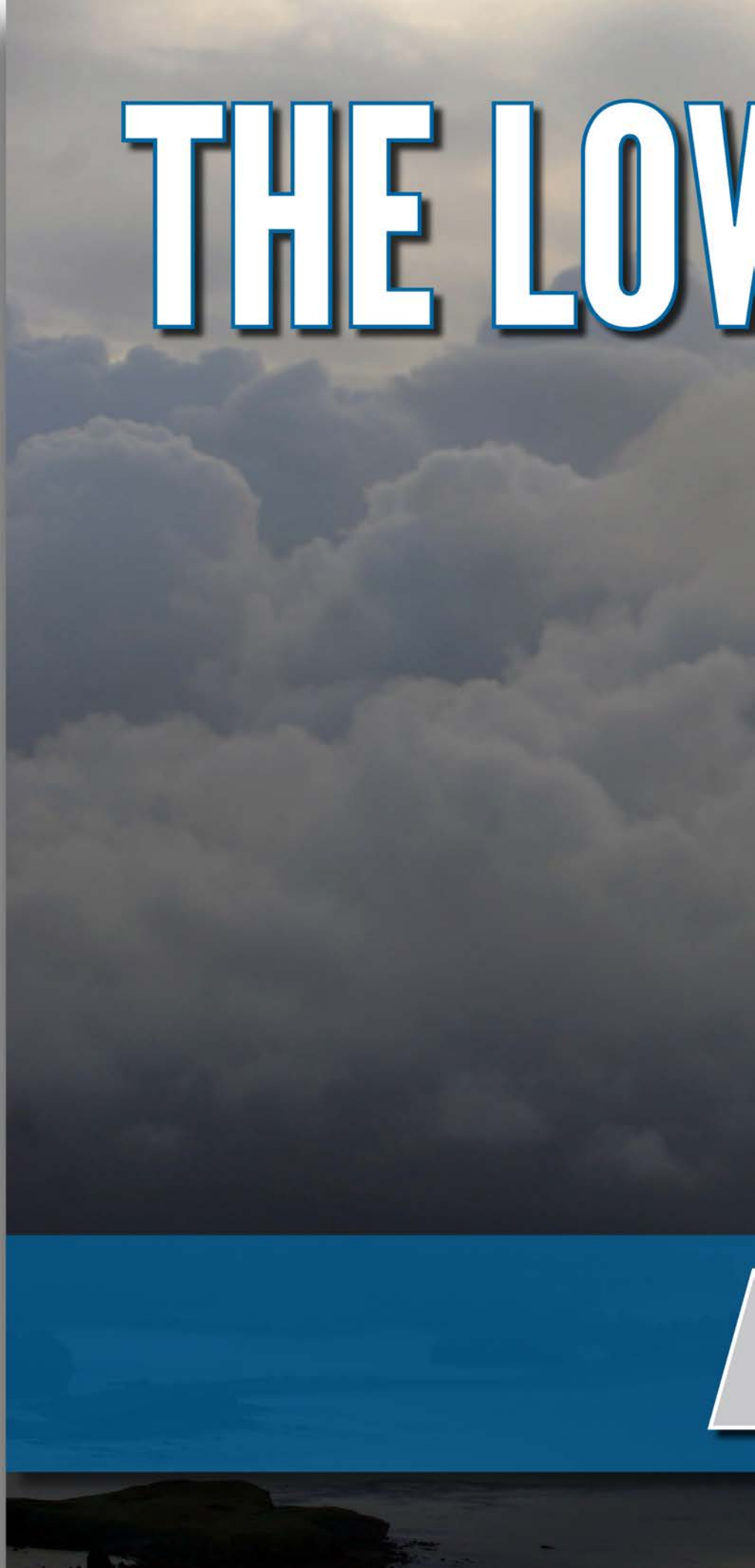
Three Elements

Let's take a brief look at the first two elements and then spend some time on the third element, the one that applicants most commonly misunderstand. These elements fall under 91.175 (c)1-3 subparagraph (i).

The first element deals with being able to descend to the runway without getting screams from your passengers (or your CFI-I). The regulations specifically state:

"The aircraft is 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." So, no autorotations from the MDA just to make the runway!

A further review of 91.175 you will see (no pun intended) that the second element required to continue to operate below the MDA/DA is that "The flight visibility is not less than the visibility prescribed in the standard instrument approach being used." This is a no-brainer in theory but being able to apply the correct "flight visibility" is an acquired skill that comes in time. Judging ½ or ¾ mile visibility just isn't something we do on a regular basis in the helicopter arena.



W DOWN

Story by Matt Johson

Images by Ryan Mason

On Going

DOWN BELOW

And finally, the regulation goes on to state that: ", at least one of the following visual references for the intended runway is distinctly visible and identifiable to the pilot." And this is where the fun beings as there is a long list of items. This list includes:

1.) The threshold

2.) The threshold markings

3.) The threshold lights

4.) The runway end identifier lights

5.) The visual approach slope indicator (VASI)

6.) The touchdown zone or touchdown zone markings

7.) The touchdown zone lights

8.) The runway or runway markings

9.) The runway lights

10.) The approach light system, except that the pilot may not descend below 100 feet above the touchdown zone elevation using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible and identifiable.

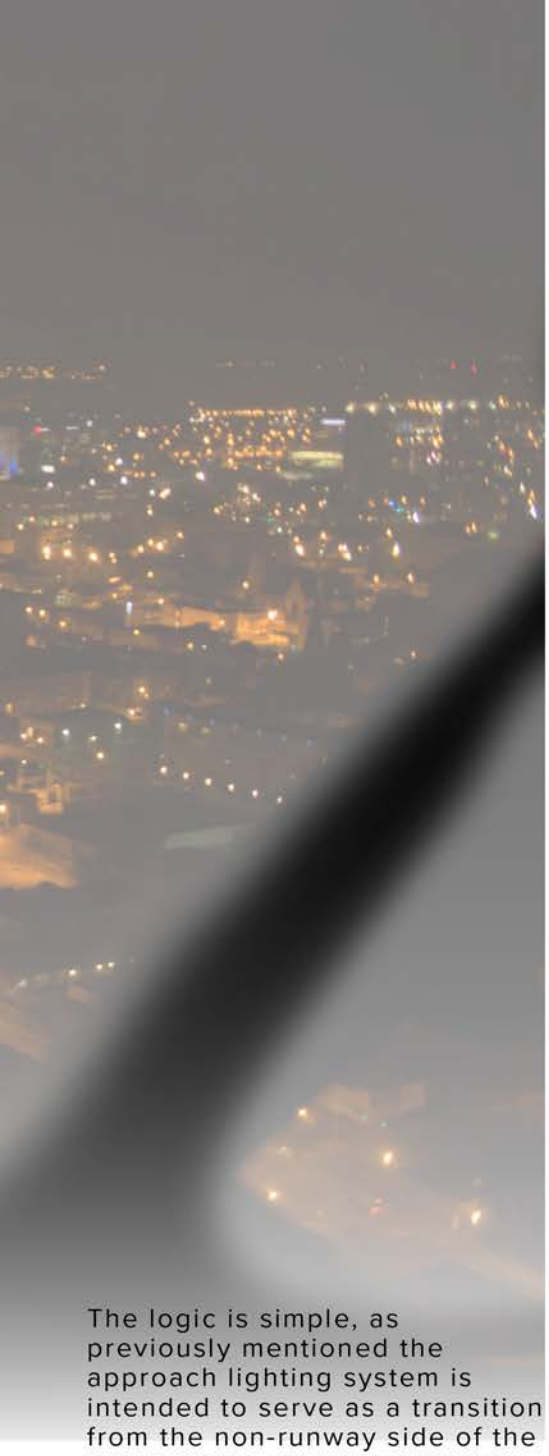
If you happen to be an aficionado of the FAA Regulations, you will notice that I listed "the approach light system" last and not first as it in the actual regulation.

Looking at this list what do they have in common? Its simple really, the first nine items are found on the runway side of the landing threshold, and the last item (approach lighting system) is found as a transition, leading up to the actual runway or said another way, on the non-runway side of the threshold.

What does all of this mean?

So what exactly happens when you get to the MDA/DA, and you can only see the approach lights instead of one of the other nine items? Can you land? Maybe!

Note that the regulation states "the pilot may not descend below 100 feet above the TDZE using the approach lights as a reference unless the red terminating bars or the red side row bars are also distinctly visible AND identifiable". In other words, the identification of the approach lights may be used for the initial descent below an MDA or DA, but you MUST NOT go less than 100 feet above the Touch Down Zone Elevation (TDZE).



The logic is simple, as previously mentioned the approach lighting system is intended to serve as a transition from the non-runway side of the threshold to the actual runway landing side. Therefore you have a limit of how low you can go, and that is not lower than 100 feet above the TDZE. There is an exception to this, however.

The Caveat

Notice that the regulation states "unless the red terminating bars or the red side row bars are also distinctly visible and identifiable." In other words, if you have the red terminating bars or the red side row bars distinctly visible you may continue down below the MDA/DA.

Here is the question that leaves most applicants with the proverbial deer in the headlights look. What approach light systems have the red terminating bars and red side row bars? The ALSF-I and ALSF-II (approach light system with sequenced flashing lights) are the only approach lighting systems with these particular red bars. So, without the red bars associated with the ALSF-I and ALSF-II, you will be required to automatically limit your descent to a minimum of 100 feet above TDZE until you can identify some other reference on the runway side of the landing threshold.

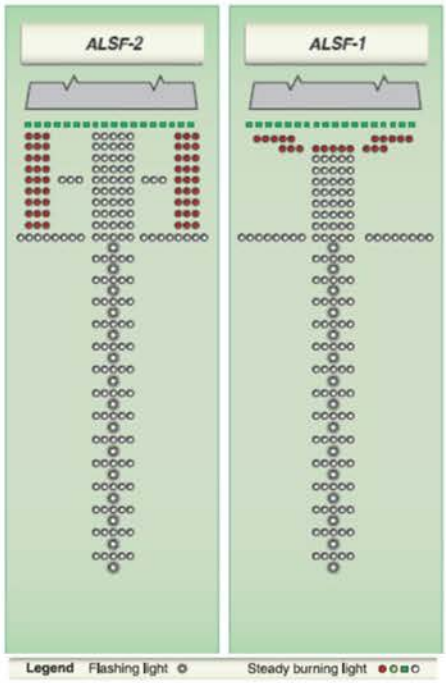
The Reasoning

The reasoning behind this is that those above "red bars" are located close to the runway threshold and can easily be seen because of their color contrast. In fact, the red bars on the ALSF-I system are butted up against the green threshold lights. If in this instance you can see these red bars it is "assumed" that one of the other items on the runway side of the threshold will be identified and you can continue with your landing.

Generally speaking, the ALSF-I is used on runways for Category I approaches where the ALSF-2 provides visual information on runway alignment, height perception, roll guidance, and horizontal references for Category II/III instrument approaches, the type of approaches typically conducted by the airliners.

Summary

Obtaining your instrument rating can not only make you a better (safer) pilot (and more employable) it can be a lot of fun. However, as you can see from reading this article, one little caveat within a regulation can cause much confusion. It doesn't have to be hard, find a good CFI-I and dedicate a fair amount of time to your studies and you will come out on top! Or, hopefully below MDA/DA with the runway in sight.



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He is a three-time Master Instructor recipient, FAA Gold Seal Flight Instructor and FAASTeam Representative for the Greater Cincinnati Ohio Region. Additionally, Matt is an Air-Medical Pilot flying a single-pilot IFR Helicopter in SW Ohio.