

## Features December 2014 Issue

By Jeff Schweitzer

### Zero-Zero Departures

After the first 200 feet, they're usually no different from a missed approach.

Last year I read in a major aviation publication that lifting off in zero-zero conditions was one of the “riskiest and dumbest decisions” in all of flying. In late October 2014, I attended the annual convention of a major flying club, where I heard basically that same conversation and conclusion. If I had any hair on my shiny bald head, I would pull it out in frustration.

Let me say this loud and clear: I do not advocate zero-zero or low-visibility takeoffs. Allow me to repeat: I do not advocate zero-zero departures. Please keep this in mind as you read on. I have no objection to any pilot who decides never to do one; that is perfectly fine and defensible. Good call.

#### Objections And Caveats

I do object, however, and rather strenuously, to the blind, unthinking, lemming-like adherence to any view with firm conviction in the absence of any compelling evidence to support the righteously held opinion. To be specific, I am talking about pilots who without any deep thought as to why (or why not) a low-visibility departure may or may not be an acceptable practice are adamant that zero-zero takeoffs are “risky” or “stupid” or “crazy” or “irresponsible”—all descriptions I have heard. This knee-jerk approach to risk assessment and management does general aviation no good. We can improve our safety record only through careful and sober analysis of aviation’s risk and dangers; not by spouting off platitudes we have heard from others and repeat without further thought.



In the end, a zero-zero departure is no crazier than many other IFR operations we take for granted; your personal minimums may well prevent you from doing a low-visibility departure, but that absolutely does not mean that a pilot who chooses to do so is acting in any way other than prudently and responsibly. In fact, nearly all instrument-rated pilots—including you—have performed a zero-zero departure; they just didn’t know it. If you don’t believe me, just read to the end.

One additional caveat: This discussion assumes we are talking about only pilots who are current and proficient, operating well-maintained equipment fully compliant with all regulations, service letters, service bulletins and ADs. If a pilot or aircraft is not up to the task, then taking off in low-visibility conditions is an unacceptable risk. For others, it’s a risk, but its acceptability depends on all the facts and circumstances.

#### About Jack and Diane

Let’s follow two pilots as the day breaks one fine Sunday morning. One we’ll call Jack wakes up ready to take his plane out of his hangar at Podunk Regional for a trip to the west coast and a business meeting early Monday. The airport’s tower opens at 0600 local, and Jack intends to depart around 0800.

Meanwhile, Diane, our other pilot, is at her home field a few hundred miles away, prepping for a quick trip to Podunk Regional, where she plans meeting some colleagues for an early lunch. By coincidence, both Jack and Diane fly a PA-46-500TP, Piper’s Malibu Meridian. By chance, Diane will arrive at Podunk about the same time Jack intends to depart.

As Murphy will have it, Podunk Regional is socked in on this particular Sunday, reporting indefinite ceilings with ¼-mile visibility in mist. In fact, marginal weather with low ceilings is widespread. Diane must file for an alternate more than 100

miles from her intended destination, but that is no problem: she has plenty of fuel after the relatively short hop to Podunk. Like many Part 91 pilots, Diane is willing to “take a look” at the ILS by shooting an approach she fully expects to miss. You never know, there might be a lucky break or big enough local discrepancies in the weather to get in. She has an iron-clad rule: Never fly an approach twice—once and done. She’ll take a look, but if she can’t get in on the first try, she’ll divert to her alternate.

And this is precisely what happens. Diane takes off from her home field, knowing that the weather at Podunk is reporting below minimums, and conditions don’t improve as she nears Podunk. But hey, she has come this far and is vectored to the ILS to take a peek. Diane is a skilled and experienced IFR pilot, and she flies the ILS with precision. At the approach’s 200-foot decision altitude, she sees nothing but cloud, not even a hint of ground or flash of the rabbit. She initiates her missed approach, flies the procedure and is vectored to her alternate.

What happened at 200 feet agl when she decided to go missed? Flying in IMC at 120 knots indicated, Diane had to arrest her descent, initiate a climb, reconfigure the airplane (gear up, flaps up) and navigate to the first fix of the missed approach procedure. All in IMC with zero visibility.

Just as Diane was executing the missed, Jack finishes fueling his aircraft and filing his flight plan. He hears a low-flying aircraft pass overhead but can’t see it through the thick fog. Jack thinks to himself, “Well, that was a missed approach. This will definitely be a low-visibility takeoff.” Like Diane, Jack is an experienced and skilled IFR pilot, comfortable with his proficiency and equipment. He starts the engine and calls for his clearance. The tower asks Jack to report his position on the field since he is not visible to the controllers.

Jack is cleared to depart, takes the runway and accelerates forward. At rotation speed, he pulls back on the yoke and with a positive rate of climb, secures the gear and retracts the flaps. He climbs at the leisurely (for a turboprop single) rate of 1000 fpm. He climbs through 200 feet agl a bit under 15 seconds after liftoff.

What happened at 200 feet agl, 15 seconds after Jack’s takeoff? The aircraft was already configured to climb, and there was no need to arrest a descent. Let’s say he was a little slow in cleaning up the airplane, so we’ll presume he retracted the gear and flaps as he climbed through 200 feet. He was traveling at about 120 knots indicated in IMC with zero visibility.

#### **Snapshot: Seeing Double**

Let’s take a snapshot of the two airplanes as they each climb through 200 feet. If we obscured the registration numbers, there would be no way to distinguish the aircraft in the two images; they’re operationally interchangeable at this point. As the foregoing describes, both aircraft are in identical configurations and conditions at 200 feet agl in IMC. They’re climbing at the same airspeed, gear and flaps are retracted, climb power is selected.

There is one critical difference in dynamics: Jack was in a stable climb while Diane had to reconfigure from descent to climb. But let’s ignore that for the moment and give the missed approach a handicap for the comparison.

No matter how the two aircraft arrived at that moment climbing through 200 feet agl in IMC in zero visibility, the two are absolutely indistinguishable from that moment forward. Subsequently, both are identical in their exposure to risk and in every operational consideration. From 200 feet and higher, there is categorically and undeniably no difference between taking off in zero-zero conditions and doing a missed approach at 200 feet when the field is not in sight. So, if you have ever done a missed approach in IMC, you have done a zero-zero departure. You just skipped the 15 seconds it took to get to 200 feet agl.

#### **Objectionable Objections**

Let’s review the common objections to this idea that the two circumstances are identical from 200 feet up, and why those objections hold no water.

“But Jack can’t return to the field if he has any emergency.” Neither can Diane; the field is below minimums for both.

“But Jack did not have to take off; he could have delayed his flight until the weather improved. He was safe on the ground.” Yeah, but Diane did not need to depart her home field either, knowing that Podunk was fogged in prior to her liftoff. She could have stayed safely on the ground. Even after takeoff, Diane did not need to try the ILS knowing what weather was being reported. Nevertheless, we don’t see pilots condemning her as reckless.

“But departing zero-zero increases the opportunity for a bad outcome compared to taking off in VMC.” Of course that is accurate; but that is also true when flying an ILS to minimums vs. flying a visual approach.

“The military does not allow for zero-zero takeoffs, and if they don’t do it, we should definitely not.”

Whether or not this claim is true—and we doubt it’s true in combat—let’s presume for the moment that it is. An appeal to a higher authority to support a position is the perfect sign of a weak argument. We could equally say, “The airlines are prohibited from initiating an approach if the field is reporting below minimums.” The likelihood of landing when an airport is below minimums is not good enough to warrant the added expense and risk.

More broadly, why not say as a general rule, “If the airlines don’t do it, we should definitely not?” Some pilots may well adopt that SOP, and that is fine. But many experienced instrument-rated pilots, like Diane, routinely initiate an approach that an airline would not. Likewise, the military may well have good reasons to prohibit zero-zero departures, but before we draw any conclusions from that, we need to understand the rationale, and whether it applies in any way to GA.

And even if there are lessons to be learned from that, we still must decide for ourselves based on our own circumstances what we will and will not do, no matter who is doing something differently. Certainly we must learn from others, but not be a slave to what others do, and that includes the military and commercial aviation.

The bottom line is that no matter what objection is raised about a zero-zero takeoff, the same objection can be applied to a missed approach in IMC.

#### **No Double Standard**

A pilot may well conclude that a zero-zero takeoff is not prudent; but then that pilot must—absolutely must—also conclude that performing a missed approach in IMC is not prudent. You cannot condone one and disparage the other since both present comparable if not identical operational concerns. And any pilot who determines that a low-visibility departure is unwise should never condemn a pilot who concludes otherwise based on a sober analysis of the real risks. If you are willing to fly an ILS to minimums, you should equally be willing to consider a zero-zero departure. You can’t call one crazy and the other normal IFR operations. The two entertain precisely the same levels of risk and, after 15 seconds, are precisely the same in every regard.

The other obvious problem in labeling zero-zero takeoffs as uniquely risky is that we can list several other routine acts of aviation involving equal risk in landing somewhere uninviting. This would include flying night IMC over mountains or flying to Europe over the cold Atlantic. Or executing a missed approach in IMC. Are those crazy and irresponsible? Perhaps, but these operations are routine, done every day. Taking off zero-zero is no more or less crazy.

#### **Lessons Learned**

Take any large group of pilots and the majority will give the knee-jerk reaction that low-visibility departures are unwise. This is not an isolated issue; I hear and read in online forums similarly misguided or ill-conceived conclusions about crosswind landings, weather avoidance, engine management, mountain flying, pressurization and hypoxia, glass panels...just about anything related to IFR operations. We tend not to analyze deeply enough the factors that impact safe flight; instead, we look for quick answers in the comfort of others who likewise adopt positions without thinking them through. We do all of us a disfavor by rashly discarding reasonable dialogue about what is safe and not.

Flying is inherently risky—how we counter and manage its inherent dangers determines what risks we take. Without exploring here the difference between risk and danger, we can say that our mandate is to minimize the chance for a bad outcome on every flight through proper maintenance, training and education. But we can never reduce the inherent danger to nothing, and we take risks with every flight. Flying VFR on a clear day entails risks greater than sitting on a couch with a helmet. Taking off zero-zero is riskier than departing VMC on a calm day. With every flight we take comparative risks relative to doing nothing or compared to other types of flying.

Our willingness to take a risk is proportional to the perceived potential benefit. Great reward is often found only through great risk. Conversely, taking a big risk for a small gain makes little sense. Others have attempted to quantify risk by putting numerical values on a matrix of decision points. But that is silly because there is no absolute value to risk, only a sliding scale based on perceived benefit, which is highly dependent upon changing circumstances.

We want to make risk management easy and cookie-cutter, one-size fits all. But that is ill-advised, and leads to lowest-common-denominator and useless advice that has little operational meaning. Universal condemnation—“zero-zero departures are risky and irresponsible”—is comforting and easy, but does not advance safety.

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