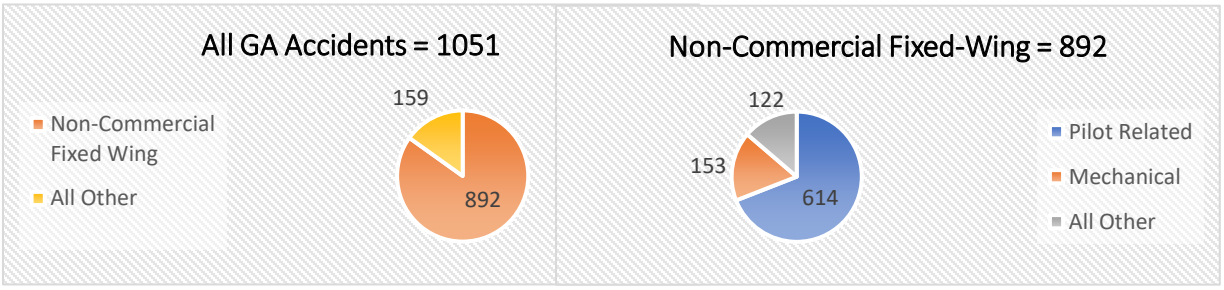
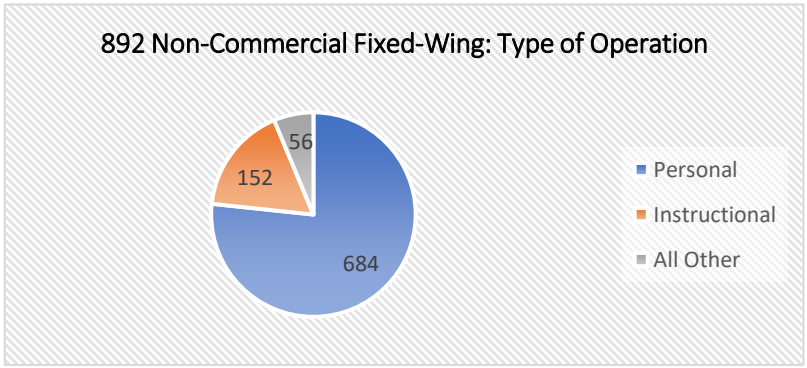
AASF Safety Spot – October 2022

AOPA recently published the 32nd (2020) Joseph T. Nall Report. For those who are not familiar, each year, the Nall Report slices and dices *general aviation* accidents by category, type, cause, etc. The source data comes from the NTSB. Since NTSB reports generally take about 2 years to go final, the current Nall Report covers 2020. Although there were no surprises, the report is useful as a guide to where a pilot's greatest risks arise.

If you are wondering how general aviation is defined for the purposes of the Nall report, here it is: "General aviation (GA) is all flight activity of every kind except that done by the uniformed armed services and scheduled airlines. In addition to personal and recreational flying, it includes public-benefit missions such as law enforcement and fire suppression, flight instruction, freight hauling, passenger charters, crop-dusting, and other types of aerial work that range from news reporting to helicopter sling loads."





The Nall report is a treasure trove of data, but you can go cross-eyed trying to divine wisdom from the numbers. I know I did. After studying the report for several hours, I concluded pilot accidents demonstrate remarkable consistency from year to year. The three charts above show us that 85% (892/1051) of all GA accidents can be attributed to non-commercial fixed (NCFW) wing operations. 77% (684/892) of the NCFW accidents occurred on flights taken for personal reasons (non-business) and 69% (614/892) of NCFW were pilot related. As they once said in the comic strip Pogo, "We have met the enemy and he is us."

The Nall report aggregates data. It doesn't speak to the unique circumstances and lessons of individual accidents. Every chart I looked at gave rise to more questions. The kind of questions that usually start

with, “I wonder why…?” Thinking about the three charts above, my question is this, “I wonder why such a large percentage of the fixed-wing non-commercial accidents are pilot related and occur on personal flights?” My belief is that it’s principally due to a lack of structure.

Why do I suspect the lion’s share of all non-commercial fixed wing (NCFW) accidents occur on personal flights due to a lack of structure? Of the 31% of NCFW accidents attributed to flights other than personal, 77% (152/208) are instructional flights. A mere 6% (56/892) of all NCFW flights are attributed to types other than personal or instructional (see Nall Figure 1.6: Type of Operation). Those pilots are operating with a specific purpose: aerial application, pipeline observation, positioning flight, business trip, etc. and with company guidance. On the other hand, a flight undertaken for personal reasons is a pure act of creation by the PIC. Beyond complying with regulations, the PIC decides what to do, how to do it, applicable personal minimums, fuel requirements, etc. Complying with regulations is a good start towards a safe flight but just a start. It’s up to the PIC to structure the flight with a solid plan that includes go, no-go and continue-abort criteria. Taking a flight without structure is an invitation to an accident. It’s an invitation that’s accepted year after year with remarkable consistency.

Thinking in Time Figure 1.7.2 of the 2020 Joseph T. Nall Report shows that VFR into IMC is still the most popular piece of the weather accident pie and the most lethal. Fatalities resulted from 9 of 11 VFR into IMC accidents. Alaska with its bountiful mountain ranges, minimal infrastructure, weather reporting stations, low-level radar coverage and vast tracks of wilderness, offers pilots abundant opportunities to find themselves going VFR into IMC. Most pilots with more than a few years’ experience have had at least one “brush” with VFR into IMC. Typically, it isn’t the result of willful disregard of the rules but rather a belief that “visibility is still workable,” or “I’m pretty sure the pass will be open when I get there,” or “the ceiling is still close to 1000 feet, I think I can fly a few feet lower.”

Alaska has a lot of Class G airspace. In Class G airspace below 1200 feet AGL, 91.155 says we can legally fly VFR with a minimum of 1 statute mile of visibility and clear of clouds. Flight visibility is defined as “The *average* forward horizontal distance, from the cockpit of an aircraft in flight, at which *prominent* unlighted objects may be seen *and identified* by day and prominent lighted objects may be seen and identified by night.” *CAUTION: LEGAL AND SAFE ARE NOT THE SAME THING.*

A long time ago, when I was flying at 8 to 9 nautical miles per minute at altitudes as low as 100 AGL, I began to think of visibility in terms of time to react to an unexpected obstacle or deteriorating weather. I’m decades removed from that type of flying now but I still like to think about visibility in terms of reaction time. Let’s consider a day VFR flight in Class G airspace with one statue mile visibility. A pilot poking along at a modest 90 knots (1.726 statute miles per minute), will observe a “prominent” object about 35 seconds before encountering said object. Objects that are less than “prominent,” like an outcrop of rocks versus a mountain, may appear at distances less than 35 seconds in the future. It’s not unreasonable to suppose that it will take at least 5 seconds to react to the object as it materializes out of the spooge. Some may prefer term schmeg or goo rather than spooge when referring to miserable visibility. It’s not surprising the spell checker doesn’t recognize any of these terms, after all, they are highly technical.

Continuing with the scenario above, 5 seconds of travel at 90 knots equals about .15 SM. A standard rate turn at 90 knots produces a turn radius of a little over .5 SM but 30 degrees of bank reduces the turn radius to about .25 SM. Going much beyond 30 degrees of bank is not advisable because, let’s face it, visibility this low means there is no discernable horizon. It’s easy to mistake the intersection of the

cloud bases and the ground as the horizon. Admittedly, the temptation to exceed 30 degrees of bank may be overwhelming as the detection of a prominent object so near the canopy often produces a bit of a startle reaction. To recap, pilots flying at 90 knots that take immediate action after identifying a prominent object 1 SM dead ahead will be somewhere between .35 and .6 statute miles from the prominent object. A full course reversal (180^{o}) at 90 knots, using a level standard-rate turn, will eat up one entire statute mile left/right of your initial heading. Using 30 degrees of bank consumes about ½ statute mile. Flying faster uses more turning room and going slower uses less. Point being, if there is another prominent object one mile in the direction of turn, you still have a problem.

We haven't considered what it means to remain clear of clouds with visibility this low. Whether the visibility restriction results from moisture, smoke, ash or whatever, flying with one mile visibility is essentially like flying in a cloud. I don't know about you, but I have difficulty determining where the edge of a cloud is when I'm essentially operating in a cloud. The point is, operating in very low (but legal) visibility, can easily result in VFR to IMC. Then what? Don't panic. Immediately refer to your instruments to confirm your attitude and turn in the direction of lower terrain. Be careful not to overcontrol. If you've kept up with your navigation you know which way to turn for lower terrain. Don't descend in the hope that you'll break out before encountering the ground.

No one takes off with the intention to fly VFR into IMC. How do we avoid this scenario? When the inflight visibility begins to deteriorate, we need to constantly evaluate the remaining visibility. One way to do that is to use your airspeed as a yard stick. Pick out objects ahead along your flight path and time how long it takes to fly by the object. One mile of travel at 60mph = 60 seconds, at 90mph = 40 seconds, at 120mph = 30 seconds. Last, if the visibility sitting on the ground is already near minimums, it's unlikely you know what you'll find once you're airborne. Use good judgment and remember, just because it's legal doesn't mean it's smart.

Failure to plan is planning to fail. Stay safe.

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