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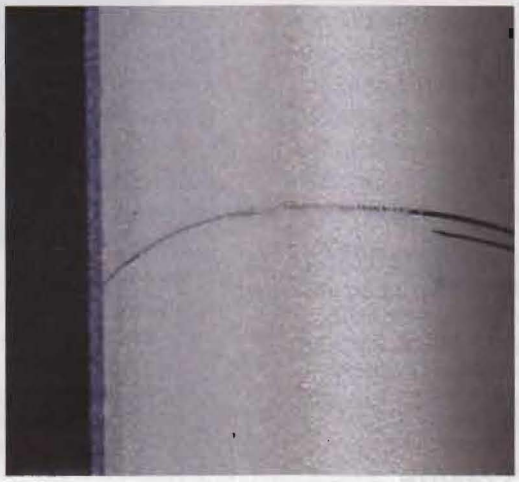

Even with certificated ice protection, there is plenty of risk for light planes in real icing conditions.

BY JASON BLAIR

SO YOUR PLANE IS EQUIPPED FOR FLIGHT INTO "KNOWN-ICING"—no need to worry, right? Think again!

When we endeavor as pilots to fly aircraft into icing conditions, we may do the best we can to make sure we avoid prolonged time in icing, heavy icing conditions and/or especially ending up in any icing conditions in aircraft that are not properly equipped for flight into known icing (FIKI) conditions. But sometimes that isn't enough.

We are just now emerging from icing season for much of the country, and especially here in Michigan, where I fly regularly, but since ice can be a threat regardless of season, I thought it might be worth highlighting some concerns that are less commonly considered when flying an aircraft in encounters with icing.

An aircraft that is equipped for icing conditions will typically have things like heated pitot and/or static ports, anti- or deicing systems for wings and tail surfaces, anti- or deicing systems for propellers or engines, and the same for the windshield of the aircraft. A FIKI-equipped aircraft

DOESN'T DO IT ALL

Stills from a NASA video showing the accretion of ice on the leading edge of a wing. Pilots need to reexamine their views if they think that Flight Into Known Icing (FIKI) approval makes their plane impervious to ice. Icing can overpower even good systems and, moreover, many parts of our planes remain unprotected despite having certificated FIKI gear.

will have all of these and maybe more.

"FIKI" isn't just a name. The approval is an FAA certification, and it isn't easy for manufacturers to achieve. Both Cirrus and Mooney have earned FIKI certification for their singles. As far as the FAA is concerned, that means the aircraft can operate safely in conditions of actual icing. Many other aircraft, and nearly all high-performance ones, have some form of ice protection, too, though mostly it's certificated not through FIKI standards but as part of the plane's type certificate, and the FAA makes no claim about its effectiveness in icing, just that its inclusion doesn't make the design unsafe as a whole.

Having these systems is great. It keeps the airspeed indicator working, the wings generating lift, and the tail from stalling. It also keeps the engine making thrust, and it lets the pilot see out the windshield. This assumes, of course, you are using all the systems properly, and they are keeping up with the amount of ice you are experiencing.

Personal experience has highlighted other risks associated with icing, specifically some things that aren't typically covered by the certification requirements for flying in icing conditions. Let's look at a few of those and think about whether they might be things you wouldn't want to be affected on your next flight.

TIRES

Even on a retractable gear aircraft, your gear has to come down to land. Most people do this somewhere before a final approach fix. Doing this on a fixed gear aircraft leaves the pilot with a few miles to go to landing. If you are still

building icing, it may accumulate on those tires. They get pretty slick or sometimes bumpy if there is a buildup of icing on the leading edge as they start to roll on touchdown. It typically comes off pretty quickly, but those first few moments can leave a pilot feeling the effect. Aircraft with wheel pants typically have less buildup on the tires but more on a wheel pant. This can lead to overstressing (from weight effects) the wheel pants or connection points on landings and sometimes vibration.

LANDING LIGHTS

Whether in the wing, on the nose wheel or in a cowling, landing lights are almost never covered by deicing systems. Older lights that got hot actually seemed to do better at melting ice off than some of the more modern, cooler, LED lights that are gaining popularity. While it may not be required to land, it sure helps in many cases to be able to use those landing lights. Flying those last 5 to 10 miles of an approach with the landing lights extended (when they are on a gear leg of a retractable gear aircraft or, in some cases, even ones that retract from the wings of the aircraft) can offer time for ice to build up. This buildup can reduce or even nullify the positive effects of landing lights. If you have the option, put them down as close to landing as possible to maximize effectiveness if the concern exists.

"EVEN 'SOME' ICE MAY REDUCE RADIO RECEPTION, LEAVING YOU WITH A SUPER FUN SQUEALING IN THE RADIOS UNTIL YOU REACH AN ALTITUDE OR FLIGHT CONDITIONS WHERE THAT ICING COMES OFF THE AIRCRAFT."

ANTENNAS

And now my favorite surprise. The antennas.

Yeah, they aren't deiced either.

I first learned this on a ride-along with a friend on a medical transfer flight years ago in a Piper Chieftain. Flying at 10,000 feet MSL, we were above the icing in nice cold weather. Unfortunately, the EMT on board told us the passenger in the back wasn't breathing well with the higher elevation, and we needed to descend. This put us solidly in icing at 6000 feet MSL. About a half-hour into that, during which time we were running our hot props and the window deice, and cycling the boots on the aircraft no longer than every five minutes, we started to get "fuzzy radios."

It wasn't long before we were effectively lost comms, not only communication but navigation as well. The VOR reception was failing. Now, this was a while ago, and GPS wasn't really a thing in most aircraft yet, but the charter company was a little ahead of its time and had as a backup in every aircraft a dash-mounted portable GPS receiver. The little antenna on that happened to be shooting through the only clear path on the window, where the hot plate was keeping it clear. For about an hour, tbis was our navigation as we headed south toward our destination, Oklahoma City. Somewhere along the flight, I do remember feeling some vibration, then hearing something hit the rear of the aircraft. We assumed it was ice off the wings as it shed off. It wasn't. But the vibration had stopped.

Further south, it got warmer, and the ice went away, and our communications and navigation came back. We found a sector frequency and re-established ATC communication (yup, a real-life use for lost comms procedures). But we had to do it on Com 2. Com 1 didn't seem to be working anymore.

We later found that the vibration was probably caused by a buildup of ice on the Com 1 antenna, a result of which it likely started vibrating from the weight buildup. The noise we heard when the vibration stopped was likely when it broke off and departed the aircraft. No doubt the reason that Com 1 wasn't working after that. Good thing there was a maintenance shop at the airport to fix it. We were back on our way the next day.

What antennas will be affected depends on their positioning on the aircraft and how bad the icing is that is being experienced. Even "some" ice may reduce radio reception, leaving you with a super fun squealing in the radios until you reach an altitude or flight conditions where that icing comes off the aircraft. It may limit your ability to communicate with ATC, definitely something that is worse the busier the airspace you are flying through.

Few people talk about the fact that communication and navigation antennas on the top and bottom of the aircraft may build up icing also.

We all know ice is bad. Most of us know to stay out of it or minimize the time in conditions where it is happening. But if you do have to go into it, do so with the knowledge of what the true capabilities of tbe systems on your aircraft are and what will be affected. It's better to come up with a game plan ahead of time than being surprised on your next flight. PP