

## ICE and AIRPLANES

By Brent Anderson

We are once again in that time of year when aviation magazines, FAA flyers, safety programs and recurrent training instructors are placing emphasis on “ICE” and “AIRPLANES”. Why? Unlike ice in your tea, ice and airplanes do not mix well together. It is not our intent here to repeat all the information you may have received regarding the dangers of ice, but rather to touch on the highlights, offer some pointers and discuss some areas you may not have considered.

Your awareness of a hazard is the first step in managing it. Here are some basic facts to help you see the overall picture of accidents relating to “ICE” and “AIRPLANES”. The following statistics are based on General Aviation including personal and business operations.

First of all, to keep General Aviation flying safety in proper perspective:

We can expect one accident for every **17,052** hours of flying.

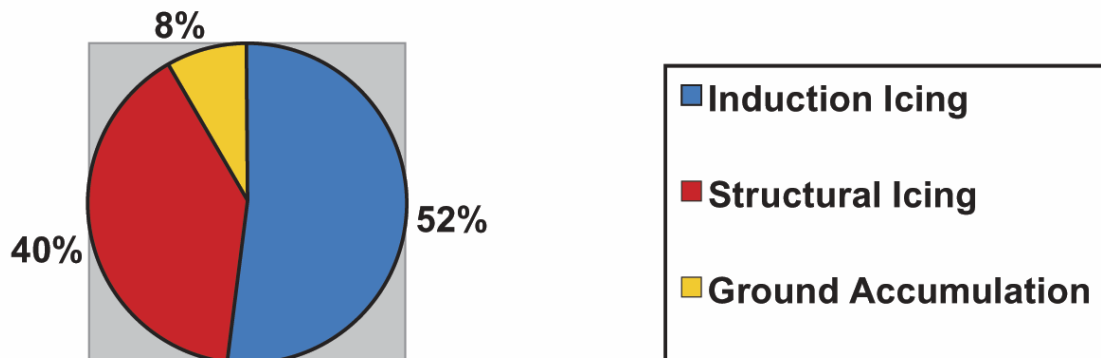
We can expect one fatal accident for every **82,958** hours of flying.

Considering this, the average pilot could expect to fly many lifetimes without having an accident. At the same time, more than 1,500 General Aviation accidents are likely to occur this year. Historically speaking, over two-thirds of General Aviation accidents involve personal flights conducted by non-professional pilots, while only a small fraction involve professional pilots flying corporate business aircraft. One statistic that is of concern:

**seven out of ten General Aviation weather-related accidents are fatal.**

In accidents where icing is a contributing cause, the leading factors are:

### INDUCTION ICING – 52%



This is like getting an ice cube stuck in your throat, cutting off your airflow. It is time for that Heimlich maneuver, which is really tough to do on an airplane. Piston aircraft are the most susceptible to this “ice in the throat” stuff. The use of carburetor heat is the solution, but we tend to forget that, particularly in clear weather. Remember, there is still a high probability that this could happen when the sky is “clear blue and 22” with high humidity and temperatures between 20 and 70 degrees Fahrenheit.

Also included in induction icing is the blockage of intake air by ice forming over the air intake filter. This blockage can be bypassed using alternate air, similar to opening your mouth to breath when your nose is stopped up. Alternate air – do you have it? Where is it? Does it work? Some are manual, some are automatic. Get your Pilots Operating Handbook out and be sure you know how to do the Heimlich on your airplane to keep it breathing.

### **STRUCTURAL ICING – 40%**

Ice collecting on the surface. It is everywhere! On the wings, on the tail. It will also accumulate on antennas (which can break off), gear, struts, fuselage, and the windshield. Did you know 30% of the total drag from an ice encounter can remain after all protected surfaces are cleared by ice systems in the form of accumulations on unprotected surfaces? Things to keep in mind: What is a tail stall and how do you recover? What about use of the auto-pilot, ON or OFF?

### **GROUND ACCUMULATION – 8%**

Just like it sounds, this is the buildup of snow or ice on your aircraft while it’s sitting on the ground. You may see a very light snow on the wing and think it will just blow off, but what’s under that snow? Frost, snow or ice accumulations no thicker than a piece of sandpaper can reduce lift by 30% and increase drag up to 40%! Several aircraft accidents have occurred in the past year as a result of the decision not to de-ice before takeoff. Be sure you know what you’re seeing. For some interesting reading, *see National Transportation & Safety Board (NTSB) Accident number NYC04LA044 at [www.nts.gov/ntsb/query](http://www.nts.gov/ntsb/query).*

Now that you know the basics about the different types of icing, you need to prepare yourself and your aircraft to handle it. Or in some cases, to not handle it. If you’re not equipped and certified for icing conditions and known icing is forecasted, your decision should be simple. Remember, the FARs prohibit flight into known moderate icing conditions without the proper equipment.

## **ASSESS THE POSSIBILITY OF ICING CONDITIONS ON YOUR ROUTE OF FLIGHT**

Today we have many tools available for use during pre-flight planning to determine the possibility of icing for any given flight. Most often, the problem is the failure to use these resources to make the proper decision. A small amount of time spent in preparation can be a great investment. Here are some valuable pre-flight tools:

- A thorough briefing from Flight Service
- Current pilot reports  
(Please remember to give pilot reports as well.)
- Online weather sources. You might try  
<http://adds.aviationweather.gov/icing>.

### **EVALUATE YOUR AIRCRAFT'S ABILITY TO HANDLE ICING – WHILE IT'S STILL ON THE GROUND**

It is a given, the colder it is and the stronger the wind, the shorter the walk-around preflight will get for most pilots, especially if the pilot is used to warmer southern climates. Not a good thing, just a fact of life. Unfortunately, this is the time you should be paying closer attention to your aircraft's condition and taking the time to check anti-ice and de-ice systems to ensure they work. Always prepare for the worst and have a plan in mind should you need to get out of icing conditions. If you are properly equipped, the next step is preparing for what could lie ahead.

### **PREPARE FOR WHAT LIES AHEAD**

Review the Pilot Operating Handbook to refresh your understanding of how to correctly test and operate the systems. If you're unprepared for icing conditions, be ready for some uncomfortable situations and anxious passengers. When ice starts hitting the side of the fuselage because you forgot to turn the prop ice system on before entering icing conditions, you can expect your passengers to start asking "Who's throwing rocks at us at 25,000 feet?" They tend to get pretty nervous about strange noises. Even worse is the incorrect use of engine ice protection systems resulting in ice ingestion or FOD (Foreign Object Damage) to the engine. If you're the pilot, get ready to do some explaining to the owner! If you are the owner and the pilot, get your wallet out. Which naturally brings us to some concluding remarks about insurance.

Is damage caused by in-flight icing conditions covered by your aircraft insurance? If you have in-flight hull coverage on your policy, yes it is. Broken antennas, airframe dents caused by ice chunks, and even ice ingestion (FOD) to the engine are covered losses. The in-flight deductible will apply and you may have a separate higher deductible for FOD damage to the engine. One exclusion with regards to cold weather is damage caused by freezing, like the expansion of trapped freezing water in an aircraft system. In-flight hail damage is also a covered loss but we will wait to discuss that in our spring issue. Until then, don't let the winter conditions "bring you down" and let's be prepared to fly safe. →