SALT LAKE CITY DEPARTMENT OF AIRPORTS

GENERAL AVIATION NEWS

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FAA SAFETY TEAM

Dennis Seals has joined Rick Stednitz as an FAA Safety Team Program Manager for the FAA Northwest Mountain Region region. Dennis has been involved in Aviation Safety since 1972 and has 9,500 hours in both helicopters & airplanes. He is a retired Master Army Aviator and has been an Operations Inspector at the SLC Flight Standards District Office since 1997. Dennis' & Rick's offices are located at the SLC FSDO.

The FAA Safety Team mission is to improve the Nation's aviation safety record by conveying safety principles and practices through training, outreach, and education. The FAA Safety Team also establishes meaningful aviation industry alliances and encourages continual growth of a positive safety culture within the aviation community.

Information on becoming part of the FAA Safety Team may be found at www.faasafety.gov .

ELECTRONIC GA NEWS

If you would like to be on the electronic GA News mailing list, send an e-mail request with the e-mail address to which you'd like the monthly newsletter sent to steve.jackson@slcgov.com

U42 ITEMS

The **plane wash** at Airport #2 has been closed for the season. Expect it to be available again in the spring when threat of freezing has passed.

Utilities infrastructure construction at Airport #2 is complete. All taxiway restrictions have been lifted.

Bird roosting and nesting areas are being eliminated as they are identified. If you have a particular problem with birds in your hangar contact Steve Jackson at 801-647-5532 or Mike Rawson at 801-575-2894 and we will address your specific problem expeditiously.

THE TROUBLE WITH ZERO

By Thomas A. Horne in AOPA Pilot Magazine

From the earliest days of ground school we've all learned about the temperature ranges associated with icing conditions. Clear icing-that slick, tenacious, transparent coating associated with cumulus clouds-happens most often in the zero-to-minus-10-degree-Celsius range. (That's 32 to 14 degrees Fahrenheit for those of you who prefer what is rapidly becoming an obsolete method of temperature measurement, at least in technical circles. We'll stick to Celsius from now on - besides, it makes most icing rules of thumb easier to remember.) Rime icing favors stratus clouds and the minus-10-minus-20-degree range. Let the mercury drop below minus 20 degrees and the chances of icing age greatly minimized. Below minus 40 degrees, its way too cold for icing's super cooled droplets (subfreezing droplets that are still liquid), so the threat of icing disappears. At that temperature, any moisture will be in the form of ice crystals.

But when it comes to the most dangerous icing temperatures for all aircraft, let there be no doubt. It's the narrow temperature band that straddles zero degrees. This includes temperatures as high as plus 5 degrees, and as low as minus 5 degrees. Of course, this is not to say that deep, deep trouble can't be found below minus 5 degrees. It certainly can, and many icing-related accidents have occurred in conditions where temperatures were at, or well below, minus 5 degrees.

But recent research and accident studies have proven that zero degrees is an especially bad neighborhood in which to be flying. And it doesn't much matter what kind of airplane you're flying, its power rating, its size, or whether it's certified for **F**light **I**nto **K**nown **I**cing (or FIKI, in acronym speak) conditions.

There are many good reasons to be wary of zero degrees. For one thing, super cooled droplets tend to be larger around this temperature. Warmer air (a relative term, to be sure) can hold more moisture than colder air, and this is especially true when an air mass is saturated-as it is in clouds. This translates into more liquid water content-the amount of liquid water in a given air parcel-and therefore larger water droplets. How large, you may ask, and why should you care?

Testing parameters for compliance with FIKI rules specify that candidate aircraft fly in cloud conditions with droplets as large as 40 to 50 microns in diameter, and these sizes are most likely to occur near the zero-degree mark, and shapes can cancel out any benefits of the ice-protection system. The leading edges may be clear of ice, thanks to the boots' inflation, but the frozen runback can pile up just aft of them.

If you have more than a few hours flying in winter, by now it should be obvious that having an ice-protection system in no way guarantees safe flight in all icing conditions. Yes, the leading edges may be protected, but it's the runback ice and the rest of the ice accumulated on unprotected surfaces-wing tips, fairings, antennas, strakes, and other components that can cause airspeed and lift to plummet. That's particularly true in temperatures near zero degrees.

(One micron is one-thousandth of a millimeter.) While 40 to 50 microns may not sound very large, it's the size at which an oncoming droplet begins (after splattering on impact) to run back on a leading edge. Super cooled drizzle drops (identified as the main meteorological culprit in the landmark, October 31, 1994, crash of an American Eagle ATR-72 at Roselawn, Indiana) can have diameters as great as 400 microns, or 10 times as large as "conventional" icing droplets. And freezing rain's droplets can be a whopping 4,000 microns in diameter.

When large droplets like the ones just mentioned hit an airplane, they are more likely to run back. In other words, after hitting the leading edges of the aircraft the droplets still have enough mass and fluidity to flow past the impact zone-and past any ice-protection panels, such as inflatable deice boots-and coat an entire airfoil.

Eventually, this runback will freeze to the wing or other unprotected surface. And this brings up another danger of flying near zero degrees. Frozen runback can form ridges and other lift-destroying shapes just aft of leading edges. In aircraft with deice boots, these ridges pointer-that expands and contracts with temperature changes. Or sometimes OAT gauges use an electrically powered, or thermocouple-driven, temperature sensor

that posts its results on a liquid-crystal or other display. Either way, OAT gauges can have errors of several critical degrees. An OAT may read plus 3 degrees, but is it really that warm outside?

Other factors also can make OAT gauges read on the high side. One is ram rise. While we usually think of ram rise as affecting the temperatures around fast moving, high-flying turbofans and turboprops, it also can affect much slower-flying aircraft. Ram rise is the temperature increase caused by the frictional effects of air striking an aircraft-and its temperature probe. Studies have shown that aircraft flying as slow as 150 knots can post OAT readings up to 3 degrees higher than the actual air temperature. This temperature is called the "static air temperature," or SAT. SAT is the temperature that would be recorded if the aircraft had somehow been stopped in flight. There would be no frictionally induced errors in this static condition that the OAT gauge tries to duplicate. Some OAT probes have a holed, cylindrical glove around them to try to make the air striking the probe as "static" as can be.

Turbofan and other high-performance airplanes have air data computers that compensate for ram rise and produce a ram air temperature (RAT) reading, and use still other variables to produce a total air temperature (TAT) reading that's useful for calculating Mach numbers and other performance data. But TAT is usually higher- than SAT. Most of us don't have TAT is usually higher-some-times much higher-than SAT. Most of us don't have TAT readouts, and most of us don't need to know TAT. But the point remains: Your OAT probably doesn't yield an accurate SAT, and it's the SAT that's important for accurately identifying the critical icing temperature ranges.

Moral: Don't become complacent if you see a plus-3, or even a plus-5-degree reading on your OAT. Your actual outside air temperature may be zero degrees. For this season, many turbofan pilots make sure their anti-ice equipment is on when they see a plus-5-degree OAT, you should too. This provides a conservation margin against the chance of any ice forming near the zero-degree point. Here's another big-iron tip that will keep you out of trouble when flying in and near any clouds or precipitation… turn on your pitot heat before taking off in near freezing weather, and leave it on.

Another tip to remember this winter: Keep an eye on the OAT gauge! So many pilots all but forget about the OAT, but it should be part of your normal instrument scan. One winter, I flew with a very skilled instrument pilot on an IFR cross-country, and he handled the airplane perfectly. But even after an extended period of time flying in the clouds, he never checked the OAT. Meanwhile, it was minus 5 degrees outside. I noticed the first signs of icing, and it came as a surprise to this high-timer. If he'd been scanning his OAT he would have had plenty of warning. Good thing the cloud bases were high that day, and there was above-freezing air below us… we dodged an icy bullet!

Don't even think that winter icing concerns are only for IFR pilots and flights. Anytime there is visible moisture (even fog and clouds) and the OAT gauge reads plus-5 degrees or less, ice can form rapidly. A heavy and inefficient airfoil will not fly any better in VMC than it will in IMC.

Enjoy the beautiful winter flying but remember "The Trouble With Zero" and be aware, knowledgeable, and prepared.

HELPFUL POINTS OF CONTACT

For GA operational, facilities maintenance, aviation newsletter, airfield, and SLC Title 16 questions call: Steve Jackson, SLCDA General Aviation Manager, 647-5532 or e-mail at steve.jackson@slcgov.com.

For hangar lease and repair questions call: Mike Rawson, Properties and Contracts Specialist, at 575-2894 or e-mail at mike.rawson@slcgov.com.

For aviation security questions call: Connie Proctor at 575-2401.
For gate access problems call: Airport Control Center at 575-2401.

For emergencies call: at SLCIA, 575-2405
at TVY or U42, 911 then 575-2405

For common General Aviation information call the GA Hotline: 575-2443

PERSONAL LOCATOR BEACONS

As times change and technology advances it may be time for you to consider investing in a personal locator beacon (PLB) to carry with you on your back-country hikes and cross-country flights. PLBs are portable ELTs that can be used anywhere. Most cost around $500, require no installation, and can be used in the air, on a boat, while hiking, or anywhere a user may need assistance. Like an ELT, when activated, a PLB signal is sent via 406 to NOAA SARSAT, which activates SAR crew response. Most are GPS-enabled, allowing for precise searching. They must be manually activated and can be registered with personal information.

UPCOMING EVENTS

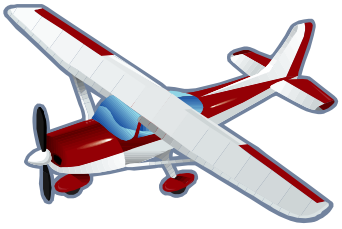
Leading Edge Aviation Logan (LGU) - Leading Edge Aviation has a free breakfast in their hangar on the 2nd Saturday of each month from 8:00 am to 10:00 am. They'd enjoy seeing you there. For more information about Leading Edge and its events, visit www.leaviation.com .

Air Center of Salt Lake (U42)**,** the FBO at Airport #2, has suspended its Fly-in and Barbeque for pilots, family, and friends at its West Jordan for the winter.

Dave and company will start them up again next spring. For more information about Air Center and its events, visit www.aircenterofsaltlake.com .

--SAFETY FIRST--

Do NOT Store Fuel or Operate Open Flame Devices or Heaters Inside of Hangars!



Have safe and happy holidays!