GROUP 6

CALIFORNIA WING - CIVIL AIR PATROL

Aircrew Safety Briefing

"Put icing on ice"

(Editor's note: Information for this Aircrew Safety Briefing came in part from AOPA, which has several excellent articles on winter flying and icing on its home page, www.aopa.org).

Just as we have to adjust our vehicle driving to deal with winter weather, so we must adjust our flying. In many ways, winter is a pilot's friend – at least in parts of the West we get clear visibility with reduced smog, and our engines, props and wings perform better.

But we must never lose sight of aviation's winter monster: *Icing*. Even if you fly an aircraft that is certified for flight into known icing conditions – and most of us don't – icing can bring any ship down, and has. The standard advice is to stay out of visible moisture when temperatures at *altitude* are at the freezing level. But experts warn that atmospheric moisture which is barely visible can cause trouble.

The airframe itself is a great condensation nucleus, but there are many others that contribute to the problem and complicate issues. Any drag-inducing bits and pieces can attract ice. Pitot tubes, fuel overflow vents, external mechanical connectors and the like can cause such problems as inaccurate airspeed indication, reduced fuel flow and stiff controls. But they aren't the worst killer:

Beware the stall

In most cases, the extra weight of ice is not a pilot's biggest problem. But even a small layer of frost can change the shape of a wing's leading edge in a way that completely changes the way an airplane flies – or, all too tragically, doesn't fly.

Every pilot depends on his aircraft behaving in predictable ways. Always keep in mind the old adage that when ice collects on the wing, you've become a test pilot because the most significant aerodynamic characteristics of an aircraft derive from its wing design. And when

that shape changes, the most dramatic and significant change usually is the stall regime. In that situation, don't depend on the POH or the stall warning system – they are calibrated on the basis of an as-designed airfoil in good condition in a standard atmosphere.

But what to do when the iceman cometh? The common advice is to add power to keep the aircraft well above stalling and seek warmer temperatures by changing altitudes, usually lower (if the weather briefer has specifically said there is an atmospheric inversion in the area, temperatures may be more suitable at higher altitudes, but that is rare). And land ASAP.

What happens if an ice-induced stall does occur? Oddly enough, it depends. …

Every pilot has practiced stall recovery until he is blue in the face – but it may not be that simple. If the entire aircraft shudders and (typically) pitches up and then falls forward and perhaps rolls to one side, you have a classic wing stall that responds to classic recovery techniques: Yoke forward and add power until airspeed recovers, then gradually add power to recover attitude and altitude.

But there is also a tail stall, which is what its name implies. The difference is crucial, in both recovery technique and in symptoms – a buzzing or vibrating control column (assuming you don't have stick shaker installed), especially on flap or trim change, the yoke pitches often forward on its own and controls become stiff.

If that happens, undo flap and trim changes and very slowly pull *back* on the yoke, according to Kurt Blankenship, a research pilot at the NASA Glenn Research Center in Cleveland, quoted by AOPA.

In either case, once recovery is achieved, land as soon as possible. If runway and traffic conditions allow, make a straight-in, no-flaps, low angle of descent, high-speed approach. But, as always, the best approach in icing is avoidance.

(Note to all Group 6 personnel: Neither the Aircrew Briefing *nor the* 60-Second Safety Advisor *are meant to be top-down only. Comments, criticisms, suggestions and contributions are welcome and may be incorporated into future issues. Send comments to cbagdikian@suddenlink.net.)*