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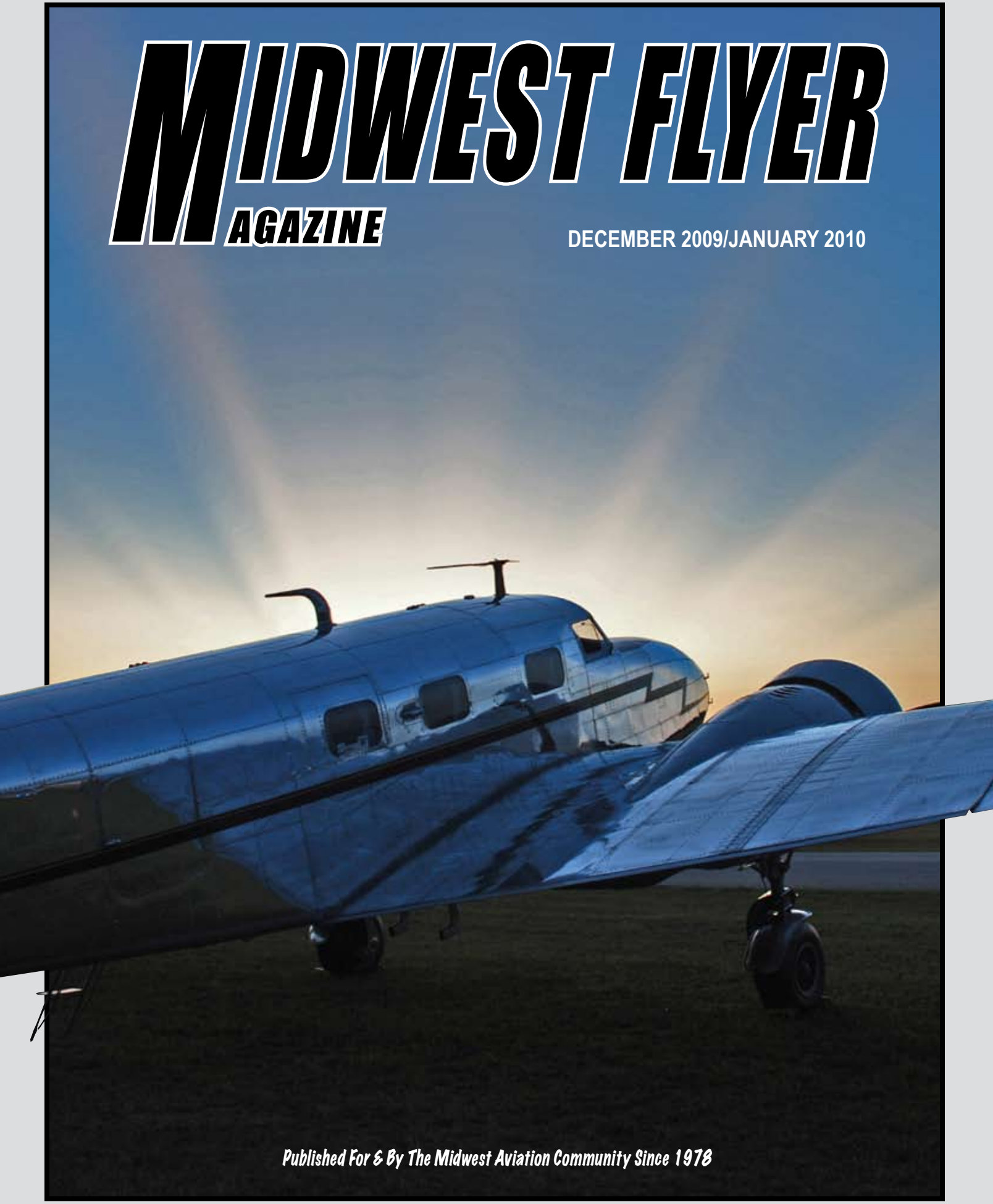

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Think Twice Before Flying In Ice

by Jeff Taylor

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Jeff Taylor

When you fly an aircraft that is not certified to fly into known icing conditions and it starts to accumulate ice, like it or not, you have just become a test pilot. Aircraft manufacturers, knowing they will not certify an aircraft for known ice, do not test fly it in icing conditions, so the aircraft's performance and handling characteristics with structural ice are unknown. When you fly this plane into icing conditions, you are at the controls of an aircraft with severely diminished aerodynamics. Is this what you anticipated when you departed?

When ice accumulates on an aircraft, its aerodynamics change in several ways, and none of these changes are good. Smooth airflow over the wing is required to generate lift. Ice build-up disrupts that airflow, both increasing drag and reducing the airfoil's ability to generate lift, all while the weight of the aircraft increases under accumulating ice. To compensate, the pilot adds power and raises the nose to maintain altitude. Now, with the angle of attack increased, the underside of the wings and fuselage start to accumulate additional ice, adding more weight. Ice will also accumulate on every exposed frontal surface of the airplane – not just on the wings, propeller, and windshield, but also on the antennas, vents, intakes, and cowlings, which can cause antennas to vibrate severely and break. The airplane will stall at much higher speeds and lower angles of attack than it normally would, and it can roll or pitch uncontrollably, making recovery impossible. In moderate to severe conditions, a light aircraft can become so laden with ice that continued flight is impossible.

Icing accidents typically occur during the approach and landing phase of flight. As the aircraft's airspeed is reduced during the approach to the runway, the airplane may stall unexpectedly since the speed at which the airplane will stall is no longer known. Remember, you are a test pilot, so you can forget about the white arc.

Normally, an aircraft's wing is designed to stall first at the root, then progress outward toward the wing tip. However, during a flight through an ice-laden cloud, the outer area of the wing ahead of the aileron will accumulate ice faster than the root area, creating a situation where the wing tip stalls first. In addition, the ice accumulation may not occur symmetrically between both wings, creating major problems with roll control. If you find yourself in an icing situation, maintain a higher than normal approach speed. How much is hard to say since every airplane and situation will be different. Nevertheless, you can keep the odds in your favor by looking for a long runway and avoiding the use of flaps.

While we have focused on ice accumulation on the aircraft's wing, we should also pay closer attention to understanding the effects of ice on the aircraft's tail. During normal flight, the horizontal stabilizer provides a counterbalance to the tendency of the nose to pitch down. The tail is, in effect, an upside down wing. When ice accumulates on the tail, it is no longer able to generate enough lift and it will stall, causing the nose to pitch down severely. In addition, the tail is more susceptible to accumulating ice than the wing since its chord length is shorter and the leading edge radius is smaller. In fact, the tail can collect two to three times as much ice as the wing, and the pilot typically will not see it.

So how do you recognize a tail stall? You are probably in a tail stall when you extend flaps and the pitch control forces become abnormal and erratic. In addition, you will feel a shudder in the control column, not in the airframe as you would in a wing stall. Tail stalls usually occur with flap extension or at the high speed limit for flap extension. The challenge in dealing with a tail stall is that the recovery technique is opposite of a wing stall. Begin your recovery by immediately raising the flaps to the previous setting, pull back on the yoke and reduce power if altitude permits; otherwise maintain power, and do not increase airspeed unless you must to avoid a wing stall. See what I mean

WATA Difference
WISCONSIN AVIATION TRADES ASSOCIATION

Terrorism & War Risk Insurance – Do You Really Need It?

by Jeff Rasmussen


Jeff Rasmussen

Since 9/11, there have been no domestic terrorism events involving aircraft. In early February, someone sought to create a problem with general aviation by planting a fake pipe bomb at Middleton Municipal Airport-Morey Field in Middleton, Wisconsin. When shocking events like these occur, they can lead to many concerns about personal safety and risk management. Aircraft owners and airports see the TRIA and terrorism coverage notices that are available on our aircraft and airport liability insurance policies. Like most things in aviation, our skills can get rusty without practice *(just as my CFI from my last BFR!)*. We are overdue for some recurrent training on the topic of terrorism and war risk insurance.

What is TRIA?

TRIA is an acronym for "Terrorism Risk Insurance Act," which was first enacted by Congress in 1992. It requires insurance companies to offer terrorism coverage to policyholders. As a part of this legislation, the U.S. Government is partially backing the insurance companies should a TRIA-defined event occur. Like any insurance policy, there are definitions, conditions, and exclusions. TRIA is no different.

In order for an "Act of Terrorism" to have occurred, it must meet with four (4) main conditions.

First, the act must occur on U.S. domestic soil, onboard a U.S. air carrier, U.S. vessel, or on a U.S. mission.

Second, it must be committed by foreign terrorists. Timothy McVeigh and the Oklahoma City bombing would not meet the TRIA definition.

Third, it must cause bodily injury to more than 50 people or cause more than $5 million in property damage.

Last, the U.S. Secretary of State must declare it an act of terrorism.

What are the insurance implications for me?

Terrorism and war are items that are typically excluded by aircraft and airport liability insurance policies. These coverages are usually available to be purchased from most aviation insurance companies. Many of the companies charge a nominal fee for them. One large underwriter of aircraft insurance charges a mere $1 for TRIA. On some airport liability policies, others can charge considerable amounts upwards of $5,000 or more for the coverage for TRIA and war. For corporate aviation, it can vary from $0.05 per $1,000 of value and 10% of the liability premium.

CONTINUED ON NEXT PAGE

FLYING IN ICE CONTINUED

about tail stall recovery being opposite of a wing stall recovery?

Before your flight, remove all frost, snow, or ice from the wings and control surfaces. There is no such thing as "just a little ice or frost." FAR 91.527 states: "No pilot may take off in an airplane that has any frost adhering to the wings or stabilizing or control surfaces." Recent research has shown even a small amount of ice contamination can have very detrimental effects. Armed with this information and details of a high profile accident in Colorado, the National Transportation Safety Board (NTSB) took the unusual step of sending a letter to all pilots urging them to "run their hands along the aircraft's wings before takeoff to make sure tiny amounts of ice have not formed and increased the risk of an accident." They went on to say that fine particles of frost or ice, the size of a grain of table salt, and distributed as sparsely as one per square centimeter over an airplane wing's upper surface, can eliminate enough lift to prevent that airplane from taking off. A perfectly clean wing is the only safe wing.

There are many resources available to learn more about aircraft icing. One very useful site on the Internet is NASA's, "Aircraft Icing – Online Courses & Resources," which can be found at http://aircrafticing.grc.nasa.gov/index.html

One of the best resources available for icing forecasts is at http://adds.aviationweather.gov/icing/

Even a small amount of ice can dramatically alter your ability to control an aircraft. Learn all you can about the weather conditions where icing is likely to occur and how to avoid it. If you do enter flight conditions where ice starts to accumulate, take immediate action to change your flight conditions. Generally, an area of icing is not particularly thick or widespread, but do not delay in getting out of it. Leave the test piloting to someone else! ❑