

Out in the Cold

Winter flying has unique rewards and challenges. In order to keep it safe, think ahead and be fully prepared before venturing out in the cold.

Winter weather often falls into one of two camps. Anticyclones can bring clear crisp days, with light winds, no cloud, and unlimited visibility after an early morning frost – perfect flying weather, I hear you say. In contrast, anticyclones can also bring cold miserable wet conditions, with a low cloud base or fog, and poor visibility – the sort of day you wish you'd stayed in bed.

The Handbook states that ice that accumulates while the crew waits for the AFM recommended thickness can be far more dangerous than inter-cycle residue ice.

The first challenge is to get flight crews to activate de-ice systems early. A lot of the inflight, ice-related accidents and incidents are so vicious, it has become fairly apparent that they occur when de-icing systems are not used.

Icing

Induction system icing forms insidiously and affects both IFR and VFR aircraft, while airframe icing is primarily, but not exclusively, a problem that IFR pilots must manage.

Ice accumulation (on the leading edges or upper aerofoil surfaces) no thicker than a piece of coarse sandpaper can reduce lift by as much as 30 percent and increase drag by as much as 40 percent.

Despite new technology, training and procedures being developed over the years, accidents related to icing conditions continue to occur, because improved equipment and operating procedures do not in themselves guarantee safety. In order for them to be effective, they must be applied with understanding. Pilots, air traffic controllers, and ground crews, must have a thorough understanding of the effects of icing.

A resource to help pilots further enhance their knowledge of icing is the *Aircraft Icing Handbook*, available on the CAA web site, www.caa.govt.nz, under "Publications – Good Aviation Practice booklets".

This Handbook brings together a wealth of information on icing-related accident prevention issued by various international authorities. It gives an overview of both airframe and induction system icing, including the kinds of ice involved, their effect on flight, recognition and prevention. The preflight preparation section covers de-icing versus anti-icing decisions and techniques on the ground.

Inflight management of icing is also covered. For example, the best operating procedures for pneumatic de-ice boots in turboprop aircraft are discussed. The question posed, is whether to activate boots at the first indication of ice accumulation, or wait for ice to reach a thickness recommended in the Aircraft Flight Manual.

In most of these incidents, the FAA suspect the flight crews were comfortable with some level of accretion and intended to delay the activation of their de-icing systems until they gauged that the ice had reached [the AFM] recommend thickness.

The authority [FAA] believes there is generally great danger in waiting – that pilots do not seem to appreciate the significantly increased drag, and loss of stall speed and manoeuvre margins, that develop from a seemingly innocuous frosting of ice.

The *Aircraft Icing Handbook* has a section specifically on the New Zealand icing environment, as well as a helicopter icing section covering rotor system, engine and airframe icing.

Remember that if severe icing is forecast anywhere along your intended route at your intended altitude, you cannot go unless you receive first-hand information that severe icing will not be encountered (rule 91.421). First hand information could include a recent Pilot Report (PIREP), or ground-based weather radar information which indicates the icing conditions are less than severe and are within the certificated capability of the aircraft's ice protection equipment.

For more information on severe icing and PIREPs see the article "Full Circle" in the September/October 2010 issue of *Vector*.



GA Winter Flying

The *Winter Flying* GAP booklet has a wealth of winter flying tips for the GA pilot – practical things you might not think about if you are used to the comfort of summer flying.

For example, you should have the heating and defrosting systems checked if it has been several months since they have been used. Make sure you have a current carbon monoxide (CO) detector so you can safely use your heater, and keep a cloth handy for demisting the cabin windows. Misting can be accentuated when warm bodies in damp clothing are on board – your demister may not be able to cope.

If you are wet, your body, especially your feet, can become very cold when you climb to altitude. Not only can this cause hypothermia, but it will also have a detrimental effect on your ability to fly the aircraft and make a safe landing. There have been cases where people with very cold feet failed to land safely because they were suffering from the early stages of hypothermia.

Remove wet clothing if possible, and try to keep your feet dry, especially if your heater does not work. It is a good idea to keep dry clothing inside the aircraft.

The booklet also includes sections on preflight preparations and what to expect during starting, taxiing, takeoff, inflight, landing and parking. It also covers ice protection systems.

Winter flying can be a spectacular experience, especially in the South Island's snow-covered Southern Alps, so get a copy of *Winter Flying* today, read up, and get out there and enjoy it.

Winter Flying is available on the CAA web site, www.caa.govt.nz, or email info@caa.govt.nz for a free copy. ■

