

# Tips for Winter Operations

*Winter is with us again, and there are some particular aspects to think about with our flying. We note just a few here – check the GAP booklet on **Winter Flying** for further information.*

## Frost

Jack Frost is out and about in many parts of the country, particularly in inland areas in the south. If your aircraft is parked outside, don't plan on an early morning takeoff after a cold clear night.

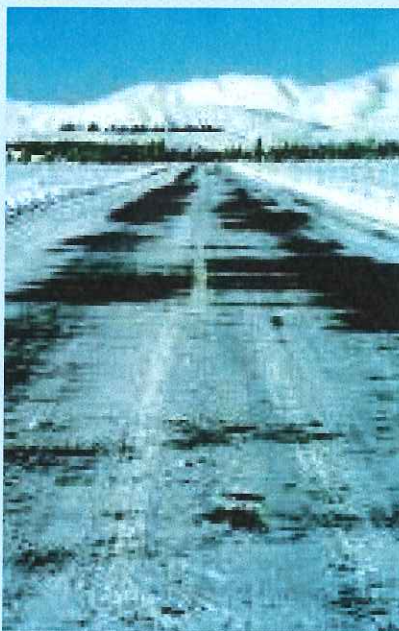
Even a light layer of ice or frost on the wings will result in higher stall speeds and lower stall angles of attack. The frost imposes a greater degree of surface roughness, which increases skin friction and reduces the kinetic energy of the boundary layer, causing incipient stalling of the wing.

The aircraft may get airborne in ground-effect, but when the nose is raised to climb away an incipient stall may result at an angle of attack considerably less than normal for the particular weight.

Any takeoff with frost or ice on the wings and tail surfaces can be fraught with danger, so why take the risk when only a minimum of time and effort is required to clear it away beforehand. The exercise will help warm you up!

For small aircraft, hand-brushing will clear what is not stuck to the surface. Patches of solid ice can then be removed by 'sawing' backwards and forwards over the surface with a length of material or hemp rope. Hard-edged tools must not be used. Plastic cards are particularly good for windscreens.

Snow, ice and frost should be completely removed from helicopters. Even a small amount of ice remaining on a portion of the rotor blades could set up a vibration that leads to loss of control.



*“Fog can be prevalent in certain places in winter. Pay special attention to temperature and dew point values in forecasts and reports.”*

## Surface Conditions

As frost thaws, a grass runway will have a slippery layer on a hard base. Braking action will be reduced with the danger of skidding, particularly if the brakes lock, with possible loss of directional control. Do not brake harshly; use intermittent brake application.

Snow, slush, mud and wet grass will all adversely affect takeoff and landing distances and possibly affect directional control.

## Heating and Defrost Systems

Check that heating and defrosting systems are working correctly.

Misting on the inside of the windscreen can reduce visibility markedly. The problem can be accentuated when warm bodies in damp clothing climb on board. If your demister doesn't work well, make sure you have a cloth handy to keep the windscreen clear.

Winter temperatures mean we are more likely to use the heater, so check for any signs of leaks in the system that may allow carbon monoxide (CO) gas into the cabin. A carbon monoxide detector can be cheap insurance – most types consist of a small sensitive spot that will darken when CO is present.

## Starting Your Aircraft

A fully charged battery is essential for winter operations. Low temperatures mean harder starting due to low engine oil viscosity and reduced battery performance. This generally imposes high loads on the battery and electrical system.

In winter, starting requires more priming in both fuel-injected and carburetted engines. Carburetted engines can be particularly hard to start. There is an increased chance of additional fuel igniting during the start, particularly if incorrect priming techniques are used. Brush up on fire-during-start procedures.

If you come from the far north and are planning a winter holiday in the south, make sure you are well briefed before you leave on how your engine should be treated in cold-weather situations.

## Weather and Daylight

Although we can have some brilliant clear days in winter when navigation is easy and the colder temperatures enhance aircraft performance, there are many days when flying conditions are less favourable and sometimes downright impossible.

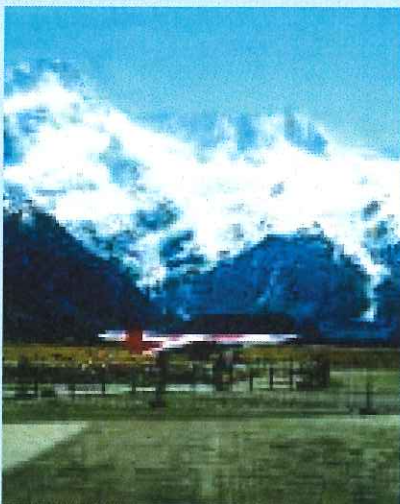
Obtain thorough weather briefings before flight. Allow for the shorter daylight hours in winter, remembering that when cloud cover is present, it will become dark earlier. For VFR operations, plan to arrive at your destination at least 30 minutes before Evening Civil Twilight (and remember that it will get noticeably darker as you descend).

Fog can be prevalent in certain places in winter. Pay special attention to



temperature and dew point values in forecasts and reports. If the wind is forecast to be light, and the gap between the temperature and dew point is already small, there is a good chance that fog may form as the temperature drops. Be careful when planning flights towards the end of the day in areas where fog may form – this applies to airfields near water sources such as lakes, rivers or the sea, and also in hilly or mountainous terrain where valley fog may develop.

Late afternoon light with long shadows and possibly haze or the beginning of mist can affect visibility and perspective, making an airfield look different from normal, and this can be a problem for inexperienced pilots.



### Carburettor Icing

Last, but not least, be alert to the dangers of carburettor icing. Winter (also autumn and spring) conditions are generally more conducive for the formation of carburettor ice. Carb icing can occur at various combinations of air moisture and air temperature.

It can occur in flight or on the ground. It is most likely to occur at low power settings. The air temperature can be anywhere between +25 degrees C and around -10 degrees C, depending on the amount of moisture in the air – with a wider range still at lower power settings.

Be aware of potential carb icing conditions, monitor and recognise the symptoms, and know the correct preventive and remedial actions.

**A final word** – make sure you have suitable clothing and equipment on board for a potential survival situation (or a less dire circumstance such as hanging around in the cold while sitting out the weather or waiting for a malfunction to be fixed). ■

## Strap Sense

### Answer for What's Wrong Here? on page 8.

The photograph on page 8 shows three men in a Schweizer 300\* helicopter, preparing for a flight. The right door has been removed, because the flight will involve some photography.

The centre-seat occupant is not wearing a shoulder harness. "So what?" you may ask. This is quite a common occurrence. So is the investigation of accidents involving this helicopter type, in which it is found that the centre-seat occupant has not been wearing a shoulder harness.

If you check the Flight Manual for this helicopter type, you will find in the Limitations (Section II) that a shoulder harness is required for the centre-seat passenger. If you check CA rule 91.109, you will find that "No person shall operate an aircraft unless it is operated in compliance with the operating limitations specified in the aircraft flight manual". Getting the picture now?

In years gone by, several Schweizer 300 accident investigations found that the

centre-seat occupant had not been wearing a shoulder harness. The main reason for this? There was no such shoulder harness fitted. Although the point was made in several reports, this seems to have been missed by a number of operators.

The message? If there is no shoulder harness for the centre seat, you may not carry a passenger in that seat. ■



*Our friends above seem to have got the message!*

\*Prior to 1983, the type was known as the Hughes 269, or more popularly as the Hughes 300. Schweizer took over the production and product support in July 1983.

## Don't Forget the Supplements!

**D**uring a recent investigation into an accident involving a helicopter with a sling load, it was found that none of the three Supplements relating to cargo hook operations were in the aircraft Flight Manual. Thus, critical information on limitations and performance was not available to the pilot, and the pilot attempted to take off with the helicopter overloaded for the conditions.

The helicopter had supposedly undergone an ARA (Annual Review of Airworthiness) only a few months previously, although the record keeping was found to be somewhat vague in this respect. One item in the ARA (required by Civil Aviation Rule 43.153) is "to ensure that the Flight Manual is the current version for the aircraft". It is reasonable to expect that such a check will include the Flight Manual Supplements.

How do you know if you have all the Flight Manual Supplements applicable to your aircraft? Check the aircraft Maintenance Logbook to see what modifications have been made to it (this includes auxiliary equipment such as spray gear and cargo hooks for example) and whether they have Supplements associated with them. Then cross-check that all these Supplements are contained within the Flight Manual. If you are uncertain about whether there is a Supplement associated with a particular modification, contact the engineer who installed the modification and ask them to provide any relevant details. Remember, as an aircraft operator it is your responsibility to ensure that Flight Manuals are kept up to date in this regard.

(Note that the CAA used to list all Approved Supplements in the New Zealand portion of each Flight Manual. You need only, however, to insert those Supplements that are applicable to your aircraft's particular configuration.)

If you are in any doubt as to whether a Flight Manual is complete, telephone the CAA flight manual specialist Jutta Pearson on 0-4-560 9545 and she should be able to help. ■