ZERO/ZERO ON THE ROLL

In snow country, instrument conditions on the airport can create greater aircraft control problems on the ground than on the approach.

by Harry Kraemer

As I turned final to the snow-covered runway, vertigo was the last thing on my mind. The winds were calm, skies clear, and the landscape below was blanketed with a fresh snowfall from the night before.

The runway hadn't been plowed as of yet, but having been here numerous times before, I wasn't too concerned. Besides, I could see the outline of the runway by the edge lights.

I knew that the rollout would be rather short because of the fresh unplowed snow that covered the field. I decided that I wouldn't use the brakes and that I would just let the airplane roll to a stop on the 4,100-foot runway. And since I was flying a single-engine turboprop, if needed I also could use reverse pitch.

As I touched down, the aircraft quickly decelerated, and I decided to assist with reverse pitch. As I pulled the prop into reverse, I became engulfed in an instant whiteout.

Windrows of snow along the runway's edge will produce a ground blizzard in windy conditions.

Almost instantly, it felt as if the aircraft were turning. And then it felt like it had stopped. For a short period, it felt like I was moving backward.

I got on the instruments quickly. I verified that the altimeter read field elevation, that the airspeed was nearing zero and that I still was on the runway heading. The transponder was on standby because its weight-on-wheels switch triggered standby mode when weight was put on the wheels.

I had experienced a self-induced whiteout that brought on vertigo while decelerating on the landing rollout.

As we settle down and accept the winter flying season, we need to renew our interest in a couple of weather hazards that are most likely to happen when we least expect them: whiteouts and flat light conditions.

Floating Features

Whiteout conditions will occur when a layer of clouds of uniform thickness overlies a snow- and/or ice-covered surface, especially after a storm that has brought a layer of fresh, fluffy snow to the pack. The sun's rays, diffused when they pass through the clouds, help to eliminate shadows.

The vis may be solid VFR and you may be able to see for miles and miles. Buildings and other objects on the ground also will be visible, but the features will appear to float in blinding-white space.

The pilot flying in such conditions will lose all depth perception, and the horizon will disappear. During a VFR approach, the pilot may sense that he is engulfed in a uniform white glow as he nears the surface.

Whiteout conditions also can occur when flying in heavy or blowing snow. In this case the visibility is restricted due to the snow, which scatters the light and makes normal depth perception impossible.

As with any hazardous weather, it is important to recognize the onset of the conditions and take action. Certain whiteout conditions may be hard to recognize, and therefore it is more difficult for the pilot to take corrective action.

PIREPs will offer a clue, and ASOS or AWOS reports of blowing snow will give you a heads-up that you are about to drop into a featureless world. In any case, if you cannot be certain of visual clues or if the picture in the windshield doesn't make sense, get on the instruments and trust them.

Self-Induced Whiteouts

Self-induced whiteout conditions and whiteouts caused by other aircraft will affect your ground operations, whether you simply are trying to taxi behind another airplane or are producing a ground blizzard of your own during runup.

Once you encounter a self-induced whiteout, recognize it and without delay use whatever instrumentation and resources that you have available to control your aircraft until you exit the conditions or the conditions cease.

A common aircraft-produced whiteout occurs when a helicopter lands or takes off in dry or powdery snow. The downwash from the rotor blades blows the snow around, and within seconds the aircraft is in a self-induced whiteout.

Because this happens during takeoff or landing, the pilot is not focused on the instruments but instead is relying on outside references for depth perception and orientation. Loss of control here can be fatal.

Not limited to helicopters, pilots of jets and turboprops also can experience self-induced whiteouts. Dry or powdery snow is blown up as reverse is selected while on the landing rollout. In my experience, I knew that the aircraft was on the ground, but my seat-of-the-pants said otherwise.

Flat Lighting

While a whiteout on the runway will get your attention, flat light conditions are perhaps the most dangerous because they can happen on sunny days with a horizon. Pilots may be caught unaware at roundout with few references to complete the landing.

Flat lighting occurs when flying over snow-covered terrain under broken or overcast skies with intermittent sunlight. Uneven terrain will take on various shades of white. With everything below being a different shade of white, there simply won't be enough features to provide depth perception.

It will be difficult to resolve the size of hills, snow-covered trees and white buildings, and because we can see the obstructions clearly, we will have a hard time convincing ourselves that the objects are not where they appear to be.

Flat lighting also has been known to give pilots the illusion that they are descending or climbing when in fact they are flying straight and level.

Because of the loss of depth perception, landings will be extremely difficult under flat light conditions. The pilot will find night landing techniques useful, but early recognition of a descent into flat lighting conditions will eliminate the surprise and make it easier to apply soft-field skills.

Flying over snow-covered terrain while in the shadow of a mountain with clear skies also can produce flat light conditions, as will departures from snow-covered, low-lying airfields that are surrounded by rising terrain.

The pilot simply needs to be aware of these subtle factors of winter flying and know that whiteouts and flat lighting may produce illusions. Slow it down on the surface when taxiing behind a blizzard-producer, avoid runups that bury the aircraft behind you and move cautiously across snow-covered and windblown runways and taxiways.

On departure and during arrivals, as you climb or descend through the snow-white bowl, fly instruments just as you would in any IMC and be prepared to take it around — even in severe VFR — if the runway threshold that was there a minute ago disappears under a moving sheet of snow.

Harry Kraemer is an instructor and corporate pilot who holds three different Master Instructor designations.

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