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SAFETYWIRE

Advice for helicopter pilots in harsh winter conditions

(Source: Peter Blom, Sunday, 9 January 2022, Business Air News)

Some words of wisdom from European Helicopter Center's Peter Blom, regarding helicopter operations in extreme winter conditions.

Operating any aircraft in harsh winter conditions demands extra care and procedures, but never more so that when flying helicopters. Peter Blom, accountable manager and head of training at European Helicopter Center in Norway knows all about this. Here are his broad recommendations for staying safe:

As most of us know, Norway is a demanding country for helicopter operations. There are many factors involved, especially during the winter season. Icing, white-out, snow landing, weather, flame-out, fuel, starting in cold weather, parking outside, skids stuck to the ground, frozen ground and more.

It is very important to plan the flight in detail. What type of operations and where to fly/land in case of an emergency situation. What is the experience of the pilot?

What type of special training is conducted? Even if only a nav flight or training in remote areas for “white out” training, proper clothing must be worn. They say one minute flight time in the air, is one hour walking in the snow on the ground. If for some reason they have to land somewhere in an emergency and get to a cabin or higher ground to be able to communicate and get help.

White-out is a condition when a pilot loses orientation capability do to missing contrasts in his surroundings due to snow, fog and so on. It may occur on snow covered terrain on a cloudy day, or as a result of falling snow or snow surrounding the helicopter due to the helicopter downwash (a self-induced white-out). This may provoke dangerous flying conditions and total loss of the control of the helicopter.

It’s important to be aware of these phenomena and avoid weather conditions that may be dangerous.

To avoid white-out it’s important to:

1. Avoid flying at low altitude over snow covered surfaces without prober references.
2. Do not fly into heavy snow showers.
3. If it’s not possible to see the difference between ground and horizon, turn around or land.

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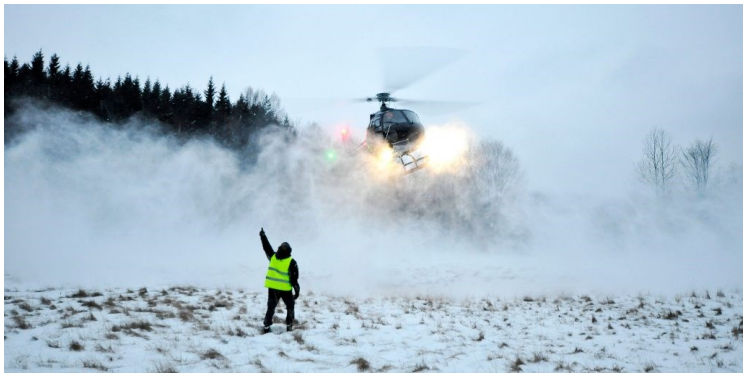

Different technics may be used to reduce the risk of entering self-induced white-out conditions:

1. If possible, stop in high hover and try to blow the snow away. Be aware of different snow types, and that the snow may start to recirculate suddenly when the helicopter is close to the ground.
2. Do not attempt to land if there is no object you can use as a reference during landing.
3. Perform a fast approach with a slightly forward movement and avoid low hovering.
4. Turn the nose of the helicopter, so the reference is visible at all time and fly close to it.
5. Make use of landing lights.
6. At take-off, lift the helicopter slowly to light on skids. If white out conditions occur land immediately, if not a max performance take off shall be performed with a slightly forward movement and always keep a point as a reference. Avoid hovering. Note: During the low rec check that the take-off path is free from obstacles, in case white-out occurs during landing and an abort is necessary.

Flat light: This phenomenon is almost the same as white-out, but may occur over snowy terrain on a cloudy day, or a sunny day when entering shadow areas. Under these conditions, it will be difficult to see contrasts like height, sloping terrain and difference between horizon and terrain. When flying in these conditions, check the altimeter and instruments more often. And landings shall not be performed without proper references.

Before landing, make sure the tail is clear and ground suitable for landing.

Landing and pick-up on soft surface: Prior to landing on snow, the pilot should always have a reference. This could be a rock, a tree, skid marks etc. Always check that the area is more-or-less flat. This could be checked with a landing light on skids, then lift up again and see that you can see both skids marks in the snow. At the same time check that the tail rotor is clear.

When landing, slowly lower the collective with a slightly forward cyclic to get the front of the helicopter lower than the back of the skids. During the landing, and slightly before collective full down, move the collective up and down to check the snow and the risk for breaking through. When lifting up the helicopter, lift the nose slightly first if the helicopter is parked with nose down.

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Check both skids free from the snow before take-off.

Note: No helicopter should land in snow depth over 30 cm without bearpaws installed.

Start up and shut down on slippery surface: When starting up or shutting down the helicopter on slippery surface, it's important to maintain focus on the instruments and keep both feet and hands on the flight controls.

If possible park the helicopter so it can turn 360 degrees without interference with obstacles. No persons on the ground should be within 10 meters of the helicopter during start up and shut down.

If possible, the landing spot should be strewn or salted. In any case at permanent landing sites.

Pre-ice and anti-ice: Be careful when removing ice and snow. Only use your hands, towels, brush and warm water if necessary. Take precautions if the helicopter is parked outside, and use covers, tie downs etc. The helicopter should be free from all ice and snow before take-off.

Icing: If encountering icing conditions, the symptoms may be:

1. Visible on the helicopters windshield, skids, mirror etc.
2. Vibrations.
3. Higher need for power or torque than normal.

Note: Operations in known icing conditions are prohibited.

Emergency procedures: The standard emergency procedures described in the emergency checklist for the helicopter type in use, is applicable. If whiteout conditions occur, the procedures depend on the flying situation.

Self-induced white-out during landing: Immediately abort the landing, and continue the take-off according to normal procedures.

Self-induced white-out during take-off: Immediately land the helicopter, if not possible immediately transfer your attention into the instruments and continue the take off until normal references are recovered.

White-out during flight: Immediately turn 180 degrees and try to recover references, and make use of your instruments to maintain control over the helicopter.

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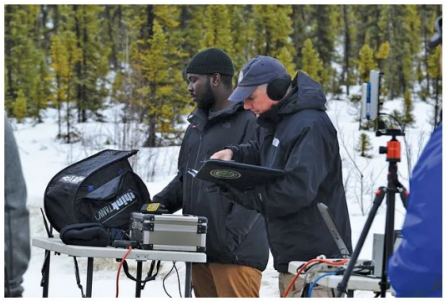
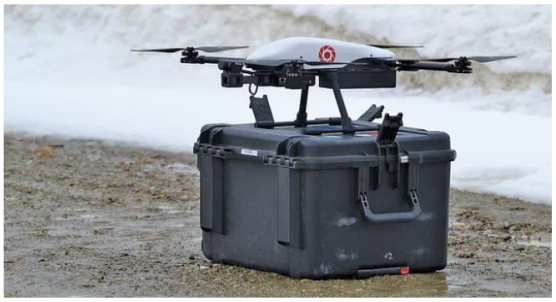
How Cold is Too Cold to Drone On?

(Source: Rebekah Waters, FAA Safety Briefing Magazine, Oct. 26, Cleared for Takeoff)





My New England-born parents taught me how to handle winter weather by prepping my vehicle (good tires, plenty of wiper fluid, full tank of gas, and clean all the snow off) and shoveling like a New Englander (early and often!). Thanks to them, you won't find me rushing out for bread and toilet paper when the forecast predicts snow. There's a similar amount of proactive preparation required for cold-weather drone operations. Weather is always a factor for aircraft, including drones — clouds, fog, or strong winds could leave you grounded. As the temperatures drop, there are even more factors to consider before takeoff.

Cold air can affect your drone's battery. Starting a car with a cold-soaked battery can be hard. Drones are no different, as their lithium polymer batteries are greatly affected by cold weather. The colder the ambient air is, the slower the electrochemical reaction will be for any system. Slower movement equals more effort to create the same level of power required by the draw of the electronic speed controllers connected to the power distribution board. Think about cranking the engine of a cold car, especially with an older battery. It's the same with drones and their batteries. Cold temperatures also increase the internal resistance of the battery, which can lower the battery's capacity. The exact temperature ranges depend on the chemistry of the batteries, but basically, colder weather equals less power.

Cold weather can also impact the electric components in DC systems. The colder it is, the slower these systems will function. The effect may be minimal, but as the energy transfer from component to component slows, it degrades the overall flight duration.

Aircraft icing, another winter hazard, can affect multiple aspects of your operation. Icing can occur when the outside air temperature is near or below freezing and the dew point is less than 5 degrees from that point. Winter air can contain droplets of supercooled water. When conditions are right, they can form a layer of ice on any surface. This is most likely when the temperatures are at or slightly above freezing. The more ice that sticks to the wing or rotor blades, the less effective they will be at generating lift.

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One upside to winter flying is the likelihood of colder, drier air. Cold air is more dense than warm air. This can improve takeoff and flight performance. Another benefit of winter flying is there is generally less turbulence which helps improve drone stability and makes for some beautiful smooth video shots!

Don't want to wait for spring to fly? The risks posed by winter weather can be reduced by proper planning or using weather-resistant hardware. Be aware of weather conditions and changes during your flight. If you must fly in frigid conditions, consider using a hybrid-electric drone. In some models, the gas engine can warm and recharge the batteries. Some fixed-wing systems have pinholes in the wing surface that release a glycol solution during flight to prevent ice formation.

Sometimes low-tech solutions work just as well. The Alaska UAS Test Site Program is no stranger to extreme winter weather challenges. At the 2019 UAS Integration Pilot Program meeting, Cathy Cahill, director for the Alaska Center for UAS Integration (ACUASI) and professor of chemistry at the University of Alaska Fairbanks, shared an anecdote about how her team uses HotHands (small pouches that provide air-activated warmth when slipped inside gloves and socks) to keep their batteries warm until the time they need to use them.

While most drone operators won't need to go to these lengths, it's important to remember how weather might impact your operations. Expect reduced battery life, reduced flight time, and have a way to remove frost from rotor blades and keep a spare set handy! Always check the forecast, and make sure you are prepared both for your comfort and the performance of your drone.

Rebekah Waters is an FAA Safety Briefing associate editor. She is a technical writer-editor in the FAA's Flight Standards Service.

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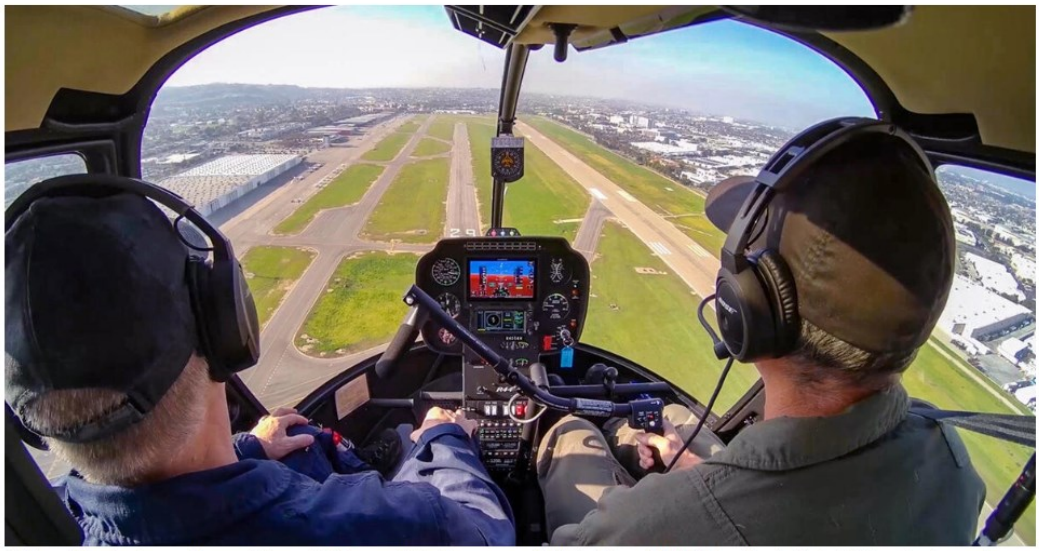
NTSB Retiring Most Wanted List

(Source: Kerry Lynch December 15, 2023, Aviation International News)



Robinson Helicopter is among the manufacturers that have a cockpit video camera available for their models. NTSB is calling for the installation of systems such as these aboard all aircraft involved in passenger-carrying operations.

After a nearly 35-year run, the National Transportation Safety Board's (NTSB) Most Wanted List of Transportation Safety Improvements is permanently retiring at the end of the year. NTSB created the regularly updated list in 1990 to place a spotlight on what the agency considered to be the most pressing safety issues. But the Safety Board said moving away from the list will bring "additional flexibility" to its safety advocacy.

"The Most Wanted List has served the NTSB well as an advocacy tool, especially in the days before social media, but our advocacy efforts must advance,'' said NTSB Chair Jennifer Homendy. "Freed from the structure of a formal list, the NTSB can more nimbly advocate for our recommendations and emerging safety issues."

NTSB's list has hit on numerous areas of aviation safety, from fatigue to distractions in the flight deck to loss-of-control incidents in general aviation and Part 135 safety.

The most recent list includes safety management systems in commercial operations, crash-resistant recorders, and flight data monitoring programs.

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SAFETY MANAGER'S CORNER

Fatigue Risk Management

The advent of more capable aircraft flying long ranges and/or long days brings human capacity for endurance increasingly forward as the prominent limiter of safe operations. Fatigue is involuntary and not something any person can cleanse away without some form of rest. It makes perfect sense that crew fatigue is one of the most prominent hazards in today's aviation environment, and a necessary solution demands a systems approach. Although not directly a component of safety management systems, a fatigue risk management system (FRMS) deals with risk and therefore dovetails nicely with SMS concepts. In a business aviation operation it probably makes good sense to use your existing SMS process and procedures to execute FRMS requirements.

Simplified, FRMS is comprised of three major component areas: 1) policy and procedures; 2) education and training; and 3) measurement. There are abundant examples of policies and procedures examples and guidance available from a variety of relevant sources; Transport Canada has published some excellent guides describing boilerplate policy. In April 2014 the Flight Safety Foundation released new flight scheduling guidelines that provide very detailed procedures for crew scheduling and associated rest requirements. When developing your flight operation's FRMS, start with these items of industry guidance and evaluate how they fit with your company's existing work and scheduling demands. They may fit nicely right off the shelf, or a few tweaks could make it so. No need to re-invent the wheel but at the same time don't try to make something unworkable work.

There are also available plenty of training items for your company's employees. The PRISM website has several fatigue focused videos and presentations found in the Employee Safety Training menu. These training items provide excellent subject matter information, but don't forget to provide training on your company's specific fatigue policies and procedures as well.

That leaves measurement as the final element for the FRMS construct. Measuring the effectiveness of the fatigue countermeasure employed through procedures and practices provides validation and manifests adjustment. How do you know it's working? That's the question measurement will help answer. A fatigue report in the PRISM HazRep Program Tracker module provides an excellent solution for measurement and can be both proactive and reactive. For certain flights where fatigue exposure is anticipated, take sample measurements by asking the crew members to fill out a fatigue report, providing details about the effectiveness of FRMS procedures as they applied to their specific flight/duty day. Reactively, a report can also be submitted when a crew member encounters fatigue, noting the circumstances and describing the who/what/why. Collecting information proactively and reactively will measure the FRMS's effectiveness and provide context for adjustment.

Most importantly, remember system implementation doesn't happen overnight and cannot be accomplished by one person. An organized plan that uses stakeholder input is always the most successful path.

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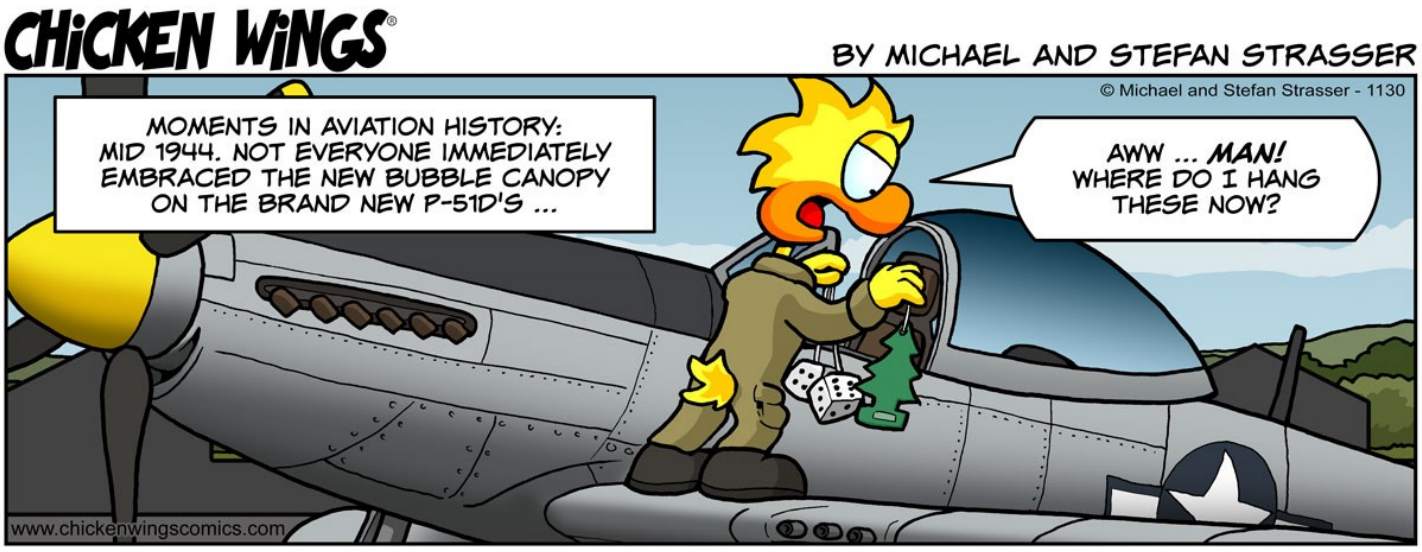
Quote of the Month

“I have been impressed with the urgency of doing. Knowing is not enough; we must apply. Being willing is not enough; we must do.”

— Leonardo da Vinci

Accomplishment is measured by what is done, and not by what could have been done. What has your flight operation accomplished in the last year? What have you accomplished in the last year? Measurement defines these things and forms the basis for future objectives. You must build on accomplishments, not on shaky ground comprised of woulda, coulda, shoulda. Goals and objectives are step one– what are we setting out to accomplish this year? Then measure– what did we accomplish this year? Any gap may be clouded by the best of intentions; regardless if it wasn’t done then the goal wasn’t met. As humans, we need goals to move ourselves and our organizations forward in logical and harmonious paths. Goals allow us to strive for better performance, safer outcomes, and increased productivity. Make it a point to constantly seek improvement and apply skills. There are few things that feel better than a job well done while working in a highly reliable organization.



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Go to Upcoming Training Classes to register.

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