



When Seeing Is Harder than Believing

The Challenges of Night Flight

By Steve Sparks

Flying helicopters at night delivers some memorable experiences for passengers, pilots, and crew members. The smooth air and shimmering lights can leave a lasting impression that's hard to beat. However, despite these simple pleasures, flying at night can increase pilot workload considerably compared to flying the same mission during the day.

At night, preflight inspections become more challenging, visual acuity decreases, fatigue creeps into cockpits, and wires along with other obstacles shroud themselves in the cloak of darkness. The additional risks associated with night flight can be unforgiving, causing the margin of safety to evaporate.

Night Stats

The U.S. Helicopter Safety Team, part of the International Helicopter Safety Team (IHST) recently analyzed 49 night helicopter accidents that resulted in 13 fatalities. Fifteen of these accidents were directly attributed to visibility and controlled flight into terrain (CFIT) scenarios, whereby night conditions played a significant role in the outcome. Several of the pilots involved in these accidents were not instrument rated or were not night proficient.

Many of the pilots involved in these accidents had less than 100 hours of total night flight experience. From these examples, it can be argued that night experience in helicopter pilots should play a significant role in determining overall risk associated with night flights.

In countries other than the United States, pilots are required to obtain additional experience and training in night operations prior to serving as pilot-in-command on night flights. This additional training typically extends beyond the regular currency requirements helicopter pilots are required to maintain for conducting similar flights during daylight hours.

The following accident reveals several factors involving night flight that can substantially elevate levels of risk. Even though many night flights are conducted in safety, helicopter pilots must be aware of the unique factors that impair safety when darkness fills the sky.

Dark, Cloudy Night

On July 27, 2013, a deadly night accident occurred in Pennsylvania involving a light turbine helicopter that ultimately killed five people, including the commercial pilot who had approximately 350 hours of total

flight experience with no instrument rating. In addition to being extremely dark that evening — the moon was below the horizon — instrument meteorological conditions (IMC) were forecasted to prevail along the intended route of flight.

The private Part 91 flight departed under visual flight rules (VFR) around 10:30 p.m. EST from Endicott, New York, before proceeding toward its destination. As the flight continued over a sparsely populated wooded area, the helicopter encountered worsening weather conditions.

Shortly into the flight, the pilot, who was receiving flight following from air traffic control, indicated, "We're inadvertent IMC, reversing" and asked air traffic control for a heading to the nearest airport.

To confirm the pilot's dire situation, air traffic asked the pilot if he still wanted vectors to the nearest airport and also if the flight was still in instrument conditions, but there was no reply. The controller provided a heading of 091 degrees to the nearest airport, but again, the pilot did not respond.

Seconds later, the controller once more advised the pilot of the nearest airport. The pilot immediately responded that he was "having trouble

maintaining control here.” The controller informed the pilot that the nearest airport was on a heading of 068 degrees and 8 miles.

Shortly thereafter, radio and radar contact was lost. The helicopter descended into trees and terrain in a heavily wooded area.

There was no record that the pilot received an official weather briefing. However, a text message sent by the pilot to a friend approximately one hour before the flight departed stated they were “waiting out weather to fly back to [Ocean City, Maryland] tonight.”

A weather observation obtained near the departure point nine minutes before the flight departed indicated winds were from 190 degrees at 8 knots, the visibility was 2.5 miles with moderate rain and mist, and there were broken clouds at 600 feet and 1,400 feet, and overcast clouds at 7,000 feet. The temperature and dew point were 19 and 18 degrees Celsius, respectively.

Approximately one hour before the accident, a surface observation from the Wilkes-Barre/Scranton International Airport (KAVP), in Scranton, Pennsylvania, located approximately 18 miles southeast of the accident site, reported winds were from 220 degrees at 4 knots, visibility 10 miles with light rain, scattered clouds at 7,000 feet, broken clouds at 8,000 feet, and overcast clouds at 10,000 feet. The temperature and dew point were 22 and 18 degrees Celsius, respectively.

The National Transportation Safety Board determined the probable cause of the accident was the pilot’s decision to continue VFR flight into night instrument meteorological conditions, which resulted in spatial disorientation and a loss of control of the helicopter.

Night Preparation

Helicopter pilots who approach night flying using a defensive mentality often experience less stress and greater satisfaction in knowing they haven’t left much to chance. As is often the case, actions well thought out on the ground often yield positive results when decisively executed in flight. Whether a particular night flight


involves a local flight or cross-country trip, the amount of preparation is usually reflected in the overall results.

A great habit before any night flight is to mentally rehearse the event from start to finish. Think through the flight as planned, but develop contingency plans should the flight have to change because of weather, mechanical problems, or any other factor. Contingency planning eliminates a lot of the pressure on

pilots and can increase the level of safety significantly.

An excellent way to prepare for unexpected influences at night is to develop a mindset of expectation: Before each flight, mentally tell yourself *Tonight is the night that I’m going to experience an engine failure or an unusual situation.*

Research reveals that it can take as much as seven seconds or more for helicopter pilots to properly respond



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to a startling event in the cockpit. Simply put, performing these what-if scenarios beforehand can help train the mind to respond positively in less time.

Distraction Management

Managing distractions while flying at night is also critical. With state-of-the-art avionics, sophisticated alert systems, and other attention grabbers finding their way into cockpits,

helicopter pilots must be vigilant to keep their attention on what matters most: maintaining aircraft control. The mitigation of loss-of-control accidents caused by spatial disorientation and distractions is a top priority as it's one of the largest contributors to both fatal and nonfatal helicopter accidents.

Tunnel vision or fixation at night often translates into degraded performance. Situations that demand pilot attention for prolonged periods

of time will often have an adverse effect on other aspects of flight. While some situations require more focused attention on a particular area or task, others require pilots to divide their attention among several different activities.

Auditory distractions cause the most harmful impact on pilot attention because they can capture attention for long periods of time. Pilots are more likely to attend to auditory distractions because of the amount of attention required to capture, process, and respond to such events.

Flight alert systems such as enhanced ground proximity warning systems (EGPWS) use digitized voice commands to capture attention, causing pilots to respond more rapidly and sometimes with haste. "Whoop Whoop Terrain Terrain Pull Up" is designed to get pilots' attention.

Checklists and SOPs

Standard operating procedures (SOPs) can also help prevent unfortunate circumstances from occurring at night by preparing pilots to efficiently handle situations in the cockpit. As most pilots would agree, anything to help lighten the workload at night is beneficial.

Unfortunately, many helicopter pilots allow the habit of using checklists and SOPs to fade over time. Remember, though, appropriate checklist usage and following SOPs are resources to improve performance, enhance safety, and reduce workload. It's as simple as that.

When Experience Is Critical

Total flight hours should not be the only variable used to assess pilot capabilities at night. Total hours logged does not preclude any pilot, regardless of experience, from making errors at night. However, accident statistics reveal that experience flying at night can have a significant influence on the level of risk associated with night accidents.

It's not unusual for helicopter pilots to have much lower levels of experience of night flying when compared to their overall flight experience. Couple low night-flight experience with low experience in the



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make and model of helicopter being flown, and the level of risk increases dramatically — sometimes by as much as a factor of seven.

In the Muck

Surprisingly, helicopter pilots don't have to be in the middle of a cloud or fog bank to find themselves in instrument meteorological conditions. Losing spatial orientation can easily occur on perfectly clear nights. As shown by the accident shared in this article, flying over sparsely lighted areas can quickly lead to vertigo and loss of positional awareness. These nerve-racking situations are especially frightful if pilots are not confident and proficient in controlling their aircraft by reference to their instruments.

Along with other industry stakeholders, HAI is spearheading several initiatives aimed at reducing spatial disorientation accidents in the helicopter industry. Drawing from the statistics, more than half of all night-related helicopter accidents result in at least one or more fatalities, a rate significantly higher compared to all other general aviation accidents. A common factor in many of these accidents was the pilot's decision to press on into worsening conditions.

Helicopter pilots are encouraged to acquire on a regular basis flight time under simulated instrument conditions with a qualified instructor or safety pilot. Because helicopters are predominately operated in VFR conditions, and since most helicopters are not certified under instrument flight rules, instrument skills can get rusty in a short period of time. Remember, seconds truly count when trying to escape disorienting conditions at night in helicopters.

If you are not instrument rated, make the investment. Instrument training enhances aeronautical decision-making and vastly improves piloting skills for dealing with night conditions.

If caught in deteriorating conditions, pilots are urged to stay on the ground, divert, or make a precautionary landing.

As the old saying goes, a good offense always starts with a good

defense. Never assume other pilots, air traffic, ground personnel, or even Mother Nature is looking out for your safety.

Night Task Management

Especially at night, helicopter pilots are tasked with concurrent events competing for their attention on a near-constant basis. The ability to

handle concurrent tasks at night is essential, but at times, it is difficult because these events often present themselves unexpectedly, with little to no warning.

When trying to sort through priorities at night, pilots should consider the level of urgency, the criticality of the event, and the amount of time a situation is going to require

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for bringing resolution. These factors are consciously and subconsciously considered by pilots each time their priority schedule changes.

Research indicates that if an ongoing task requires considerable mindful resources, it is nearly impossible to effectively perform a secondary task simultaneously with good effect. If an ongoing task is interrupted by a lower priority event, the subject must learn how to allocate his or her attention in handling both tasks concurrently or deal with each task separately when time permits. Preoccupation with one priority is most likely to be detrimental to the efficient and successful completion of another.

The Rest of the Story

Additional factors that all helicopter pilots should be aware of in planning their next night flight include paying attention to details and doing the "right thing." It involves taking the

time to run the appropriate checklists, obtain adequate rest, conduct a meaningful preflight, seek input from others, and make sure nothing is left to chance. "Trust but verify" serves as the right mindset for helicopter pilots preparing for night flight.

Running into a cloud bank or a low-visibility situation for a VFR-only rated helicopter pilot is an extremely high-risk situation that may lead to loss of control. These situations call for decisive decisions to be made sooner rather than later. A helicopter on the way to lift an injured person may find that night and reduced visibility make it necessary to move the patient to a safer landing zone instead of risking the helicopter, medical team, and pilots.

Flying at night involves many factors that pilots and crews must consider before launching into the darkness. When we least expect it, we sometimes find our careful preparations for nighttime operations lacking.

Pilots must remember their responsibilities as pilot in command and understand how dangerous it can be when the urge to complete a mission trumps safety. Everyone involved in the decision-making process about a flight needs to understand and embrace the reality that when safety raises questions about making that flight, "No-Go" is often the best answer. **R**

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