



# NIGHTMARE

OF A HELICOPTER





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## FOCUS ON SAFETY

BY MATT JOHNSON-CONTRIBUTING EDITOR

It was another morning of “ground school” with the “perfect” student. Not to worry! This isn’t a riveting account of a nightmare! As planned, I met my eager student at a local restaurant for breakfast during our discussions.

“John” as we will call him to protect the “innocent,” was nearing his checkride, which I must add he completed in the minimum number of hours, and was the “perfect” student in many regards. John gave new meaning to the old CFI (Certified Flight Instructor) cliché of “meet me half way” and we will get you through this!

After finishing up some discussion on airspace and other amusing topics like LTE (loss of tail-rotor effectiveness) and Dynamic Rollover, John presented me with a question that I must say made me reposition myself in my chair and take another gulp of my coffee. “So, tell me, on this helicopter stuff, what is the bottom line? You know – what is it that keeps you up at night?” John inquired.

Having spent 15 years in a law enforcement career, I had become good at thinking quickly both on my feet and my ass! “Well in no particular order: the IRS, good Scotch whiskey and wild women,” I promptly responded. Fortunately, John had a sense of humor.

With the laughter aside his question really did make me search deep down to answer his question. As the moments of silence passed by, I realized his question was probably the best that had ever been presented to me by a student. In reality, I realized that three things relating to helicopters are, in my opinion, not to be taken lightly. In other words, things that could weigh heavily on the mind, and “keep one up at night.”

So what are these middle of the night cold-sweat items that can affect the helicopter psyche? From my perspective, there are three: Wires, low-rotor RPM (revolutions





Wire-strikes are just one of a pilot's nightmares.  
Photo: Dana Maxfield

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## AN AVERAGE OF 65 WIRE STRIKES OCCUR EACH YEAR, WITH NEARLY 30 PERCENT OF THOSE INCIDENTS RESULTING IN A FATALITY.

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per minute) and In-flight icing.

It's no secret that we spend most of our careers in the wire-strike environment. In fact, it is estimated by some that we spend 90 percent of our flying in this environment found at less than 1,000 ft. AGL (above ground level). Thousands of new wires and towers are popping up annually. And if that doesn't get your attention hopefully this will! An average of 65 wire strikes occur each year, with nearly 30 percent of those incidents resulting in a fatality. Add night conditions or IMC (instrument meteorological conditions), or near IMC, and the chances of a fatality

occurring increases to an alarming 60 percent.

Moving on to more nightmares, low-rotor RPM is about as popular with helicopter pilots as low airspeed is with our fixed-wing brethren. If immediate AND correct response to a low-rotor RPM situation isn't applied, the results will be disastrous. Unlike an airplane, once our rotor blade(s) is fully stalled there is no recovery! In an autorotation consider this: a low airspeed may not necessarily hurt you but a low-rotor RPM encounter to the point where the airfoil is no longer producing lift and you can count on an unfavorable outcome. So, which one are





In-flight icing is another pilot's nightmare. Icing can form on the rotor blades in temperatures at or above the 32°F freezing point in areas of low pressure.  
Photo: Garth Grimmer

you more concerned about “managing” correctly?

And for my last middle of the night cold sweat: In-flight icing. In-flight icing is about as fun as standing on your head while gargling peanut butter. Unless you are fortunate enough to live in areas with warmer temperatures throughout the year, you can count on icing “opportunities.” Precipitation at or below the freezing point is an obvious concern for icing and should get your undivided attention. However, the danger doesn't stop there! Icing can form on the rotor blades in temperatures at or above the 32°F freezing point in areas of low pressure, like above a rotor blade developing lift.

It is important to remember that the amount of ice build on a helicopter (blades and airframe components) is dependent on the air temperature. During temperatures between 20°F to 32°F, ice can form on the leading edge of a rotor blade, starting at the blade root and outward, covering 70 percent of the blade span area, and covering 20 percent of the chordwise area of the airfoil. Plummeting on down from less than 20°F to 0°F, it is possible to have 100 percent rotor blade ice coverage from the root to the tips!

The dynamics of icing goes on and on and I strongly encourage you to do your homework and know the particulars of icing and its associated dangers.

While I must admit that only one of these topics has actually kept me up at night (icing encounter) they are all of great importance to me. I am thankful my student brought these topics to light for me by presenting the question he did.

Are you a CFI? A line pilot? A private pilot? Ask yourself, what matters to you, what is it that “keeps you up at night?” Share your thoughts and knowledge with other pilots and students. Sleep well and fly safe! ♦

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