HUMAN A.D. Heliprops

**HELI**copter **PRO**fessional **P**ilots **S**afety Program
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# Shared Skies

Yesterday, 26 January, 2004, while driving home from the office, I happened to notice a particularly large flock of birds flying due east. They caught my attention not only because it was a large flock, but also because of their neat "V" shaped formations. There must have been seven or eight formations each with thirty or so big birds. My first thought was that these guys were looking for a place to spend the night. The sun had already slipped below the horizon, and in a while it would be dark. I wondered if these birds were on their larger journey, already heading back north or still heading south. It seemed late in the migratory season for them to be headed south. But perhaps they were being chased south by the nasty cold weather that had recently slipped into the U.S. from Canada. This morning the low temperature here in Dallas was 23 degrees F, and is forecast to get down to 20 degrees F tonight. For us here in Texas, that is cold. But in comparison those far to the north of us, such as in Fargo, North Dakota, it is balmy. Fargo was a –31 degrees F last night! No wonder those birds decided to come down here.

***"It is easy to picture how catastrophic it would be to have any two types of aircraft run into each other. We don't seem to have the same fear of bird-strike. We should. An in-flight collision with a bird has many of the same dangers as a collision with another aircraft."***

My thoughts went further. If these birds were not looking for a place to spend the night, they would be flying in the dark, and that I would hate to run into them regardless of the kind of aircraft I was flying.

As long as we continue to fly aircraft we are going to have in-flight bird strikes. Interestingly, aviators generally have a universal fear that one of the worst things that can happen is to be involved in a mid-air collision with another aircraft. It is easy to picture how catastrophic it would be to have any two types of aircraft run into each other. Our common thinking is that almost every midair collision results in fatalities to the occupants of at least one, and often both aircraft. We don't seem to have the same fear of a bird-strike. We should. An in-flight collision with a bird has many of the same dangers as a collision with another aircraft.

Consider these following stories shared with us by readers, and reports from other sources.

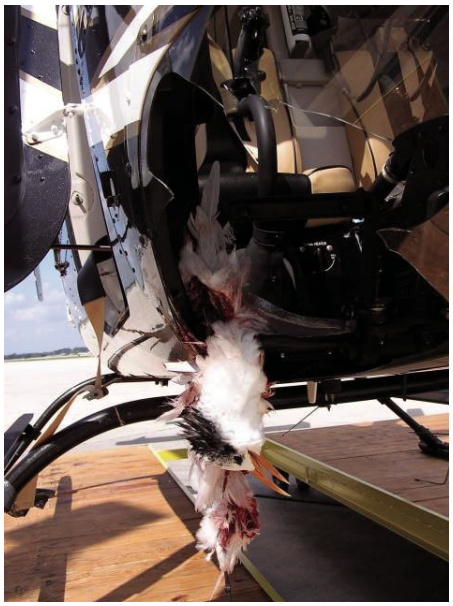

Photo Credit: D Berndt

### 407. West Palm Beach.

"I was flying our 407 just south of West Palm Beach, Florida.

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## INSIDE HELIPROPS

Typical day-VFR-weather. Good visibility. Maybe 1,000 feet above the ground. Zipping along straight and level at max cruise airspeed. This bird and I must have been approaching each other so as to keep it at a constant 2 o'clock position from my aircraft, and hidden from my sight behind the door frame. When I first saw the bird it was at my eye level, and very close to me, on a certain collision course. I had only a second to react. I naturally turned away from the bird. I was in a left roll when it impacted the helicopter on the right side chin bubble. Wham! A good smack and jolt and noise. I lowered the collective to slow down, and rolled wings level. The first thing that caught my attention, besides the air streaming through the big jagged hole in the chin bubble, was the blood on my ankles. I was hoping that the blood was not mine. It wasn't. I was lucky that I didn't suffer any injury. The quick surprise and loud impact was enough for me. I further slowed to 50 knots or so and turned back toward my base. During the few minutes it took to get there I settled down, and noticed that there were feathers everywhere inside the aircraft, and that the smell from the bird's last few dinners was quite pungent. After landing we discovered the carcass of the bird wedged up into the lower aft corner of the chin bubble."
**Personal Report**

### Agusta. Jan 2004.

"A bird crashed into the windshield of a helicopter Thursday afternoon, forcing the craft to land at Palm Beach International Airport. The bird shattered the windshield of the Augusta four-seater, sending the pilot, the only person aboard, to Columbia Medical Center with minor injuries. According to Palm Beach County Fire-Rescue workers "When you strike an object at a high rate of speed, that's a problem," said an airport operations supervisor. The National Transportation Safety Board is investigating.
Palm Beach International Airport operations officers patrol the runways firing starter's pistols and screechers to frighten feathered interlopers away. Plastic owls are mounted atop gate entrances as further deterrent. But officials can do little about birds in open-air, away from the airport. Bird strikes have resulted in annual losses of over $400 million for U.S. civil and military aviation, according to the Bird Strike Committee USA."
**Scott McCabe, *Palm Beach Post*, January 23, 2004**

### Canadair RJ200. Mar 2002.

"Aircraft struck wild turkeys. One shattered the windshield spraying the cockpit with glass fragments and bird remains. Another hit the fuselage and was ingested. There was a 14 inch by 4 inch section of fuselage skin damaged below the windshield seal on the right side. Cost of repairs estimated at $200,000."
**FAA Wildlife Strike Database**

### 412. Feb 1994.

"I was lucky. A buzzard crashed right through my windshield, brushed the top of my head and splattered itself all over the cabin behind me. I never saw it. This was a new 412 being ferried to the U.S. east coast. I was on autopilot, cruising at 130 knots, and about 500 feet AGL I was leaning over slightly with my head turned left and facing down, adjusting the ADF. CRASH! Chunks of glass exploded on top of me, showering my head, face and chest with pieces big and small. Thanks to my safety glasses I didn't have anything hit or get in my eyes. Since I was solo, if I had been blinded or incapacitated, the autopilot would have continued to fly the aircraft until fuel exhaustion. My instantaneous response was that the glass windshield had failed. This was a heated glass windshield. I understand these windshields are more tolerant of bird strikes

when the glass is heated; but with the size of this bird I don't think it would have mattered if the glass was being heated at the time or not. This was a buzzard and I would guess it weighed 10 to 15 pounds. After the initial shock I was able to see the hole in the windshield, felt the wind coming in the hole, and see all the blood, guts and feathers all over the cockpit and cabin. The smell was terrible. The only injuries I received were some bruises on my chest where the glass pieces hit me."
***Personal Report***

**AH-1W. Jan 2000.**
"An estimated 9 pound eagle hit the aircraft main rotor blades. The bird was cut in half, and hit the vertical fin and tail rotor drive shaft cover. The drive shaft was scored and failed. The aircraft was autorotated. Crew egressed."
**BHT**

**MD-83. Mar 2002.**
While climbing out at 2,500 feet AGL, the aircraft hit at least two ducks. One hit the left windshield covering the entire area with the remains. The other hit the right wing leading edge and left a hole the size of a "melon." Estimated cost of repairs $60,000."
**FAA Wildlife Strike Database**

**OH-58. Mar 2001.**
"Aircraft was in cruise flight at 150 feet AGL at night when a duck hit the nose of the aircraft creating a hole 6 x 9 inches. The duck remained lodged in the hole. The crew was on night vision goggles."
**BHT**

**Cessna 172. June 2002.**
"Vulture smashed through the windshield and the right side door blew open. The instructor's headset flew out the open door. Bird ended up in the baggage compartment. Student pilot was cut on face and arms."
**FAA Wildlife Strike Database**

**TH-67. Sep 2003.**
"The aircraft was in cruise at 1,400 feet AGL when a buzzard hit and penetrated the left hand windscreen. The Instructor Pilot was incapacitated. Student Pilot with 31 hours total time regained aircraft control after losing 500 feet. The Instructor Pilot had fallen against the cyclic pushing it right and forward. Second pilot pulled the Instructor Pilot back off the controls until the aircraft was landed. The Instructor Pilot suffered a broken jaw and teeth, a split palate, broken cheek bones, broken nose, crushed sinus cavity, cracked sternum, and broken clavicle."
**BHT**

**AH-1W. Jun 2002.**
"On a ferry flight a bird hit the forward center windscreen. The copilot received facial lacerations and glass fragments in one eye. Bird was a cormorant and it penetrated the glass. Pilot had visor down. No permanent eye damage."
**BHT**

**MD-83. Sep 2002.**
"Hit two ducks. Plane was rerouted to Los Angeles and made a precautionary landing. Radome and bulkhead were penetrated. Remains found in landing gear compartment. Leading edge of wing was also penetrated."
**FAA Wildlife Strike Database**

**206B. Mar 1981.**
"Bird penetrated the windscreen and hit the pilot in the face. Pilot was incapacitated. High speed impact into trees. Autopsy showed bird remains (raven) on pilot's face. Believe he was incapacitated or killed outright. Pilot had 16, 862 hours total flight time, 9,619 hours in type."
**BHT**

**Cessna 152. Oct 2003.**
"A Cessna 152 experienced a bird strike, forcing the pilot to make an emergency landing. VMC conditions prevailed at the time. The airplane sustained substantial damage. The airplane was found inverted, a quarter of the windshield was recovered … A bird was found in the airplane. The Instructor stated that the Student was practicing ground reference maneuvers at about 1,000 feet AGL at an indicated airspeed of 90 knots. While coming out of a left turn, a sudden loud noise followed by debris was felt in the cockpit. The Instructor stated the airplane was missing the windshield and he could not maintain altitude after applying full throttle. The airplane impacted a field nose first and came to a halt inverted. The Instructor and Student suffered minor injuries."
**NTSB MIA04CA010**

**206B. Feb 1991.**
"Bird strike. Three-pound hawk hit the right front windshield.


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Striking the pilot in the chest and right hand. Lost control at 800 feet AGL and recovered at 300 feet AGL."
**BHT**

### 727. Nov 2001.

"At 0027 central standard time (night) a Boeing 727 collided with a flock of birds while on approach to land at Memphis International. The airplane received substantial damage and no one was injured. The flight crew reported that while on final approach for runway 09 at between 1,700 and 2,000 feet AGL, and at 250 knots, they encountered a flock of large birds. A bird penetrated the airplane under the captain's windshield and bird remains entered the cockpit. They landed without further incident."

### Bombardier Dash 8. Oct 2002.

"Pilot saw a large flock of birds and disengaged the autopilot to try to avoid them, but several hit with a big thud. Aircraft handled normally and landed without incident. At the gate found a bird protruding from the wing and fuel leaking out running down the wing. Another hole was found at the base of the vertical stabilizer. Engine was starting to smoke where the fuel was running down onto it."
**NTSB NYC03LA004**

### BK117. Nov 2002.

"An emergency medical helicopter ran into a group of vultures. One penetrated the windshield and one of the medical technicians was struck by one of the birds. The helicopter was forced to make an emergency landing due to damages."
**FAA Wildlife Strike Database**

### ATR 42. Oct 2001.

About 1900 eastern daylight time, an Aerospatiale ATR 42 was substantially damaged during a bird strike, while in cruise flight. There were no injuries. Visual meteorological conditions prevailed. At 5,000 feet they experienced a loud bang and subsequent roll and yaw of the airplane. They also experienced a severe buffeting and the autopilot disengaged. The flight crew then noticed that the number two power lever was jammed in a 68 percent torque position, and the aircraft was unstable about the roll axis. The crew declared an emergency and landed uneventfully. Post flight inspection revealed damage to the right wing outboard leading edge, right wing spar cap, a hole in the center fairing, and that the number 2 engine throttle pulley was broken."
**NTSB NYC02LA008.**

### 206B. Apr 1995.

"During a training flight a bird strike occurred. A Mallard Duck struck the right upper windshield frame and came into the cockpit hitting the Student Pilot in the face. The Instructor Pilot landed the aircraft without further incident. The Student Pilot received minor injuries. His helmet visor was down, covering his face. Snow baffles kept bird parts out of the engine intake."
**BHT**

### 206B. May 1995.

"While on patrol over downtown Kelowna at 1,000 feet AGL a Western Grebe hit the right door frame and windshield. The bird entered the cockpit. The pilot suffered minor facial lacerations. The aircraft was landed safely after this night mission. The bird weighed 4.4 pounds and had a 28-30 inch wing span. Aircraft speed at the time was 80 knots. The bird hit the pilot in the face. He had his helmet on and visor down. The impact broke the door hinges. The door fell off after landing when rescue people came to help.
**BHT**

### 206L1. Mar 2001.

"At 500 feet AGL on approach to a hospital landing pad, a duck impacted and broke through the left windscreen. The copilot received facial cuts and was partially incapacitated due to blood in his eyes. The pilot landed the aircraft without any further damage. Aircraft was at 80 mph. Duck was five pounds and came to rest on the stretcher next to the patient."
**BHT**

### 757. Jan 2002.

"Engine ingested a great horned owl which caused an engine vibration. Aircraft returned to land at DEN. Many fan blades were damaged. Remains were removed. Estimated cost of repairs $500,000."
**FAA Wildlife Strike Database**

### 206L3. Mar 1996.

"The EMS aircraft was hit by two geese during a night mission. One bird hit the lower WSPS cutter while the other hit the vertical fin leading edge.

The impact caused the tail rotor gearbox mounting casting to crack. The aircraft was landed without further incident."
**BHT**

**407. Apr 1998.**
"While cruising at night at 140 knots, an eagle or owl hit the upper portion of the left windshield. The bird crashed through the windshield striking the observer in the face. Bird remains were impaled throughout the left side cabin, doors, and rear seats. The outboard side of the rescue hoist fairing was damaged, and the cannon plug on the forward transmission cowling broke loose. One main rotor blade was scratched, and some parts of the bird went into the left engine inlet."
**BHT**

**407. Jan 2000.**
"The aircraft was approaching the airport when it collided with a buzzard. The bird penetrated the pilot's windshield, hitting the pilot in the face knocking him out. Pilot slumped over the controls preventing copilot from gaining full control. Copilot tried to regain control, but the aircraft crash landed and slid down a steep slope. No post-crash fire.
**BHT**

**FK-100. Feb 2002.**
"Aircraft struck a flock of geese and ingested one after takeoff. Engine vibrations caused crew to reduce power to idle. Radome was damaged. Several engine fan blades were deformed. Engine was replaced."
**FAA Wildlife Strike Database**

**407. Feb 2000.**
"During night descent at 2,000 feet AGL and 150 knots groundspeed. The aircraft flew into a flock of geese. The copilot's windscreen and door window were damaged. The aircraft landed safely. The pilot's helmet, with clear visor down, was struck by the goose.
**BHT**

Anyone who has had the patience to read through each of these short reports gets the big picture.

Bird strikes are common. They happen frequently. The U.S. Department of Agriculture through an interagency agreement with the Federal Aviation Administration compiles a database of all reported wildlife strikes to civil aircraft in the U.S. The "Report of Significant Wildlife Strikes to Civil Aircraft in the United States, 2002" indicates that more than 48,000 strike reports have been compiled for the period 1990-2003. It is estimated that this represents only about 10% of the strikes that have occurred. (These wildlife strike reports also include aircraft striking animals during taxi, takeoff and landing, but the huge majority of these wildlife strikes are bird strikes).

Bird strikes happen day or night. The birds do not have lights. You do.

They happen at various altitudes. Most below 2,500 feet AGL.

They happen to all types of aircraft.

They can be **SERIOUS**.

The reports above show the many instances of serious structural damage - the kind of damage that can disable an aircraft and force it to make a landing. As we have seen, a bird strike can generate enough energy to penetrate even a structure as sturdy as the leading edge of a MD-83 wing. Obviously, an impact that can penetrate wing skin can also injure a pilot. Miraculously, few of these reports contained fatalities. It appears that many of these pilots were very fortunate to avoid being injured, especially to the eyes and face. It wasn't luck though for those who were wearing their safety glasses or their helmet visors down. It was having the smarts and good habit to take advantage of simple but effective **PERSONAL** survival equipment.

Some of the more experienced pilots we interviewed indicate that their bird strike procedure has two simple steps. The first is to avoid them. Fly around them, but not under them. Second, if a collision is imminent pitch up and away. It's best to have the bird impact the bottom of the helicopter.

***For more information on Bird Strikes, Transport Canada has a comprehensive "Bird Avoidance Brochure" available on their website. Recommend you give it a read.***

# There I Was... *Accounts sent to us by readers*

## F-28

" It was some years ago. A warm summer day and the two of us underway for a pleasure trip in an Enstrom F-28. Both of us private helicopter pilots. It was my turn to fly this leg. We were to take off from an international airport in Germany and were cleared to hover to the helipad. We hovered into the wind with a high power setting. As we thought the two of us in a three-seater with only a half a tank of fuel were in a safe power range, we gave the tower a "Can-Do" when they asked if we could accept a downwind takeoff. We turned around on the helipad and as we were cleared for an immediate takeoff, we started our acceleration right out of the turn. At about 20 knots the rotor RPM dropped. I rolled on full throttle, but the RPM was not coming up. Simultaneously I lowered the collective. But as we were just a few feet above the ground, there was not too much to lower.

Usually, when RPM drops the helicopter begins to yaw pretty fast. This is not really all that unusual when the rotor RPM gets low because the tail rotor is not very effective in this model. As the engine does not have enough power to bring the rotor RPM back even with full throttle, the only way to handle a low rotor RPM-low altitude situation in this helicopter is putting it on the ground, if necessary with some yaw.

As we had already accelerated to about 20 knots when the helicopter began to yaw, putting it on the ground with the nose already turning was not my first choice, so I thought we could accelerate through translational lift to have the necessary power available. Due to the tail wind unfortunately this didn't work out. As the rotor RPM dropped further and we couldn't hold altitude, there was no other choice but putting it back on the ground. We were over grass, but right at the point where we were to touch the ground the grass rose up about three inches where it met the concrete taxiway. We tried to slow down as much as possible but still had sideward motion with the nose pointed about 90 degrees to the left when we touched down. The grass/concrete edge had an additional pivoting and rolling effect, so I felt how the left skid came off the ground and I saw the main rotor blades on the right side coming VERY close to the ground. As it was apparent that the whole situation could lead to dynamic rollover, I pushed the collective down. After two bounces we came to a stop – upright. We looked at each other, told he tower we were having engine power problems, and got a clearance to hover back to the parking area. This was more of a sliding ground taxi. After shutdown we inspected the helicopter. We were really shocked how close this was. The tail rotor guard was somehow pushed toward the tail rotor disc so the turning blades heavily scratched the aluminum guard! Although this was an expensive experience, we were 100% happy recognizing that we were extremely close to flipping the helicopter over or at least destroying our tail rotor guard with our own tail rotor."

Photo Credit: R. Hackney

### Happy Ending

It was a winter survey job in northern Canada. I would drop the surveyors off and wait while they surveyed in their sites, and then move on to the next one. Nothing too serious. Nothing too strenuous. Just a cold winter day in the swamps.

While coming back on our way to camp, it was decided that we would stop at the local store

(Very rural. Lots of room, etc.) and park in the big grassy area away from the building and pedestrians. After a careful two-three circle reconnaissance of the site looking for power lines, I noted wires were coming to the store building from the main power lines on the far side of the road. We were going to land between the road and the building at the south end of the property where we would be well clear of the power lines. After landing and waiting with the helicopter engine running while the crew ran to the store, we were soon ready to go again. Another quick look for lines (never can look too much for them), we lifted off and with a pedal turn to the left to look down the road, we nosed over a bit and accelerated down the side of the road. Cyclic back to bring the nose up in a steady smooth climb when across the road in front of us, just below the tree-top height, were the power lines we had not seen on our initial reconnaissance.

They seemed CLOSE! Just in the bottom part of the windshield and suddenly very visible. A real quick "Oh …" and the reaction was cyclic all the way back with a little collective thrown in for good measure. As time slowed to a crawl, the thought was that maybe I could slide the wires off the bottom of the skids rather than get them hooked over the toes.

The guys in the back seat thought it was a fun ride. The one in the front with me, who saw the lines at the same time that I did, didn't

Not sure still how we got over them but we did. Came out in a real nose high attitude, close to zero airspeed. Then pushed it over the top into a level attitude trying to believe we were still flying with all the pieces attached.

With over 11,000 hours I thought I was always careful in my reconnaissance and tried to make a point of looking in the obvious places for the wires. Now I look everywhere. Power lines blend into all kinds of backgrounds, and I know that even with my fast instinctive reaction, we were lucky, very lucky."

## OH-6A

"In November 2003, I was flying an OH-6A on a border mission in west Texas along the Rio Grande with one passenger. We completed the mission without any problems. On our return trip to Marfa Airport, we were in cruise at about 85 knots and 250-300 feet AGL over mountainous terrain. Approximately 35 miles south of Marfa I noticed a vibration in the left pedal, which would build and subside. The first thing I thought was that I would have to tell the mechanics that the tail rotor would need to be rebalanced again. I had written this aircraft up for a buzzing in the pedals the previous week during a fifty-hour inspection. During that inspection, the mechanics had found the tail rotor was out of balance so they fixed it.

Just as soon as I thought about rebalancing the tail rotor, the aircraft yawed 10-15 degrees to the right. I didn't make that input! I checked the pedals and found no response in either direction. The pedals felt as if they were disconnected. There was no caution light (Chip Light) for the tail rotor gearbox and the engine and main rotor were running fine.

OK. So I just lost my tail rotor. I told my passenger what happened and explained our options. An autorotation was out of the question over that rugged terrain, and I was maintaining directional control and altitude. I figured a run-on landing at Marfa Airport was our best option. I radioed in a Mayday call to our dispatcher and requested emergency personnel to meet us at the airport.

The thirty-five mile ride home was a long one. I ran through all the thoughts on practice stuck pedals and using the throttle and collective for directional control. The thoughts of having something come off the tail and becoming a lawn dart never left me either.

With the airport in sight, I made a wide and gradual turn coming in on a three-mile final approach. Marfa's runway 12/30 is 6,200 feet of smooth asphalt. The weather was clear with variable winds out of the

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**There I was** (con't)

northeast at six knots. I knew I had plenty of room to work it down carefully. Short final started to get a little hairy! The nose of the aircraft began yawing hard to the right. I reduced throttle but held collective. It straightened out, but quickly yawed to the right again as I slowed down. With no tail rotor, yaw was very responsive to the throttle and collective. I worked the throttle and collective several times to get the right sight picture for touchdown. All I could think of was that I can't touch down sideways or we're in big trouble. At about six feet above the ground and about 50 knots, I rolled the throttle to idle and cushioned the landing. We were very lucky. It was a real smooth landing and we slid right down the centerline. No injuries and no damage to the aircraft.

After touchdown I discovered the tail rotor swashplate had come apart. The retaining nut was hanging on the spline shaft and the tab washer was in fragments. Still not sure of the cause"

*If you have had experiences that you feel our reader's would benefit from, please submit them to:*

**Bell Helicopter Textron, Inc.**
**Jim Szymanski**
**HELIPROPS Manager**
**P.O. Box 482**
**Fort Worth, Texas 76101**

# Q& Your Answers...

**In the last issue we asked,**

## Q "Have you had a Wire Strike or something close to it? How did you maneuver to avoid it?"

*On this one we received more responses than we can print in this issue. Apparently the low-flying helicopter community that does most of its work close to the ground generates plenty of Wire Strike stories - stories that are not soon forgotten, even if the wire experience was only a near miss. Here are some of the stories and reports. We'll have more in the next issue.*

**AH-1G**

A "I had one. Almost had several. And seen, first hand, the results of several more. In all these cases it seems to boil down to focusing on other things than situational awareness. I was in the Army, flying an AH-1G as a PIC during a recruiting type of demonstration in the seventies. Our attack platoon had practiced twice the day before, and my job was to fly NOE, as covertly as possible, thought the thick Mesquite trees to the area in front of the stands, do a series of pedal turns while they described the aircraft and then dash off back through the trees to join up with the other Cobras. Going in and out I had to barely hop over a set of small power lines that ran along a road at the height of the trees. We would then un-mask, simulate a shooting, re-mask and join up for a tight formation fly-by with a series of 270 degree breaks in front of the crowd to land at the airfield. Fun stuff for a 26 year-old Cobra pilot.

On the day of the demo my aircraft was fine until we got near the demonstration location. My roll channel SCAS would not stay engaged all the time and seemed to drop out at the most inappropriate times. I could still fly OK and it was only an irritation, so I decided to continue. Show time! I snuck into position, did the turns for the crowd, all with the roll channel out. The hard part was over but I was a little behind schedule. While moving through the trees I was also peeking down to try to get my roll channel to engage. We were doing about 40 knots, me glancing down, when the nose pitched down 15 to 20 degrees, I pulled aft cyclic, the nose then released, and pitched up. As it did, wires moved past the canopy throwing blue sparks, and a transformer on the pole to our right emitted a lot of sparks. The copilot then mentioned the front seat was full of smoke and I noticed behind us a grass fire had started. The aircraft was still flying OK so we continued to our position for the un-mask. I landed and I told my copilot to get out and have a look. He got back in and during the un-mask maneuver said he saw no damage. We continued on to

join the fly-by but noticed there was now no intercom or radios or SCAS. After the break, landing and shutdown I notified the platoon commander that I had electrical problems, my pitot tube was bent up 45 degrees, the canopy and fuselage had burn marks, there was a growing grass fire a mile from the airfield and my copilot and I were going to get a cheeseburger and Coke.

The show did go on in spite of everything. The key point here is that I had flown over that same set of wires five times in the last two days and they had become non-threatening, a part of the surroundings. My focus had changed to the Show, and then the SCAS problem, which pushed the other hazards of the flight out of mind. Wires and other obstructions should never be pushed out of mind."

**206B**

"On August 19, 2003, about 1945 central daylight time, a Bell 206B helicopter sustained substantial damage when it impacted power lines and the ground while maneuvering. The airline transport pilot and two passengers received minor injuries. Visual meteorological conditions prevailed for the Part 91 aerial photography flight. The flight originated at approximately 1630 with an intermediate stop at a local field site.

The 3,225-hour pilot stated that he was maneuvering the helicopter westward along a state highway for the purpose of video-filming an automobile driving westbound into the sunset. There were two sets of power lines that crossed the highway in the area that the filming was to take place. The pilot further stated that "as we continued down the highway, we came upon the second set of wires before I thought we should have. With the sun in my eyes, I didn't see them until maybe a second before we impacted." After striking the wire, the helicopter descended in a slight nose low attitude and impacted the highway, then skidded off the road into a ditch."

NTSB FTW03LA197

**206**

"I was flying a 206 in West Virginia on charter. I had three passengers who needed to go to an abandoned mine site for a property inspection. I had never been there before, so I was proceeding with caution. On my first overhead circle I thought I saw a wire, so I continued to circle looking for it again. The ground was black, due to the coal that had been left from a previous working. As I circled the passengers kept yelling "It's clear. There's nothing there." On final I was going very slow.

At about 40 feet, a large single strand, black wire hit the center of the windscreen! Fortunately the aircraft had enough power for me to stop the forward motion, back away from the line, and fly away in another direction. My front seat

# What is your Answer?

**"Before and after landing in a confined area, how do you determine that the aircraft will have the necessary performance to fly out of it? What sort of takeoff and precautions do you consider?"**

***Email your answer to:***

jszymanski@bellhelicopter.textron.com

***You can also fax your answer to 817-278-2428***

***or Mail them to:***

**Bell Helicopter Textron, Inc.**
**Jim Szymanski**
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passenger turned white, and I thought he was going to faint. Since there was no other suitable landing area we returned to the airport and terminated the trip. The feeling I had seen a wire on the first overhead had not left me, and was still in the pit of my stomach as we continued our approach. I have been a helicopter pilot for 35 years, and I still believe there is no substitute for a high and low overhead reconnaissance."

**AS350**

"I had a wire strike last year. I was spreading crushed limestone over pastures in the mountains using a Eurocopter AS350 B3 Astar with a six foot line holding a 550 pound bucket. Over two hours before my loading crew arrived, I did a reconnaissance of the three pastures I was going to work. All three were in difficult locations to reach because of the steep terrain from the mountaintop to the water at the bottom, with lots of houses. There were also numerous power lines running all around and across, some of them not on the chart. My crew arrived and we started the operation. I finished the first pasture in trips. Starting the second pasture, my choice of route felt unnecessarily long, and I searched for another with easier access to the pasture. Coming down from the field I noticed from above that I could follow a road that ran through the whole town down the mountainside. I was certain it was free of power lines, nothing on the chart either. I picked up the bucket at the loading zone, accelerated over the water to about 65 knots and started a left climbing turn. I kept between 65-70 knots with maximum continuous power giving me a good rate of climb. Half way up the hill, 100 feet above the ground, I was startled by a group of three 40-50 kV power lines approximately 15 yards ahead of me. No time to drop the bucket and do an emergency maneuver. After three extremely loud bangs, I prepared to release the load and make a landing, but the wires that were cut by the main rotor blades cut through the tailboom between the horizontal stabilizer and the aft fuselage. The drive shaft broke off, and the tail fell down to be left dangling only by a little piece of sheet metal. The helicopter suddenly started yawing abruptly counter-clockwise, and applying right pedal didn't help. The forward airspeed was gone in a split second, probably because of no vertical surfaces left to stop some of the yaw. Chopping the throttle (twist grip on the B3 model) would leave me with no airspeed at 100 feet. I chose to lower collective about one inch and deal with the yawing. As I was spinning like a carousel gone wild, keeping the helicopter level was quite a struggle. Several times I had to make maximum possible cyclic inputs. I focused my eyes about two miles outside, knowing the blue side should be up. Each revolution took about two seconds. Just before impacting the ground, I firmly raised the collective to its maximum. This slowed the rapid descent, and the right skid dug itself into the soft soil. All the yawing made the helicopter roll over and come to rest on its right side. I climbed out the left door. A few cuts and bruises, and a small whiplash, but in one piece."

**S-64**

"Actually I am a mechanic, so this is someone else's story, but I am going to tell it anyway. The strike didn't happen, but no one knows how close it came.

We were on a fire contract and had been dispatched from southern California to Washington up along the Columbia River for a major fire that was threatening several towns. I was two days behind my Bell 212, and had been at the fire Helibase for a couple of minutes when a S-64 Skycrane showed up. As I had not seen my ship in a couple of days I told my pilot to take a break while I gave it a good daily inspection. It was very smoky and the visibility was only a couple hundred yards.

The Skycrane crew rigged their Bambi bucket on a 200-foot line, took off and dipped the bucket in the Columbia River adjacent to the Firebase, and started upstream and upwind disappearing into the smoke.

At this point my pilot came down the hill toward me at a dead run, dove into the front seat of the 212, hit the master switch, grabbed the radio transmit switch, and into his helmet lying on the seat he started screaming "Skycrane! Skycrane! Wires! Wires! Wires!"

You couldn't see it, but you could still hear the Skycrane off in the distance, and you could hear the pitch change and the blades beating the air in a panic stop. About 30 seconds later the Skycrane went by headed the other way, and everyone went back to fire fighting and it was never mentioned again.

Two days later, when the smoke cleared a little, you could see what had been hiding in the smoke - dozens of wires servicing

a hydroelectric dam strung across the river about a half-mile upstream from our base."

**206**

"I fly Jetrangers for a Law Enforcement agency. I have many years of experience flying helicopters – military and civilian. Never-the-less, I have let myself get closer to wire systems than desired.

We were chasing a suspected drug dealer for more than an hour. The ground troops had a tough time trying to close-in on a racing 4x4 in a semi-desert terrain. At some point we decided to join in and descend to let the suspect know that we're on him and that his trials to escape are futile. We chose a relatively straight stretch of dirt track that he was following and descended to a 10 foot hover in front of the racing car. Sure enough, he passed right under us and continued happily on his way. Then we did the stupid thing and continued with him flying at about 50 feet above the ground. After a minute or so I noticed a set of high-tension wires crossing our path some 300 meters away. We pulled above them easily and there was no need for any sudden or aggressive control inputs.

The main issue here was that both of us experienced pilots let ourselves get into this situation because of the heat of the chase, excess motivation – you name it. We did something that was contrary to our agency's regulations (the low-level chase) and to our experience."

**206B3**

"I was flying a 206B3 single pilot with a ground trooper as an observer in the left seat, and another officer in the back. This was an early morning sortie and we were conducting observation legs trying to locate illegal trespassers and so on. One of those legs was downhill facing east in a shallow ravine. Naturally I was also looking around when the back seat guy (!!) called our attention to the low wire that crossed our path, probably some 50 meters below and 200 meters in front of us. Since I was descending along with the terrain I am not sure how high we would have cleared those wires. Again, there wasn't any need for abrupt control inputs, just adding enough power to maintain our distance above the ground.

The only reason we got even near those wires was that I did not pay enough attention to our flight path. I allowed myself to be distracted with the mission and neglected my first and foremost duty as a pilot – maintaining a safe flight path.

I think the main issue is that wire encounters happen only when you descend to their height (curious isn't it?).

Maintaining safe altitude (usually above 300 feet AGL) will clear most wires at most terrains. Descending below this altitude (if your mission doesn't require you to be at a low altitude in the first place) requires a different state of mind – you have to pay attention to the environment in a different way than before – there are different priorities. Neglecting or forgetting to change to this mode of flying could cause any pilot, experienced as he be, to find himself too close to a wire or obstacle. Another way of dealing with the wire issue is sticking to the regulations and rules – descent will only be made to a clear area after careful examination for wires and other obstacles."

**206L**

"This was a rural spot. Flying a 206L to pick up some passengers for a short trip. Hot day. West of Miami, Florida. Flew a recon to look the landing area over. I also talked to another pilot who had been in here, and he told me about the east-west wires that ran along the road to the north. I landed toward the west – into the light wind. There was one more passenger than I expected and I had a lot of fuel – we were heavy. Takeoff to the west would have to go over some buildings and trees. I wasn't certain that I could make it. Elected to hover-taxi over to the road to the north and takeoff to the west down the road. I'd keep the power lines paralleling the road on my right. It was a "running" takeoff, and as I transitioned and began to climb – WIRES! Directly in front of me running north and south. These wire were not the ones that I had been told about and saw during my recon. At this stage I knew I didn't have many options. Couldn't stop. Couldn't go over. Couldn't turn. It was either hit the wires or go under them. I went under. No contact. Way too close. Don't depend on a briefing from someone else. Make sure you do a proper recon before operating out of any unprepared field."

HUMAN A.D. Heliprops

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