HUMAN A.D. Heliprops

HELIcopter **PRO**fessional **P**ilots **S**afety Program
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Spatial Disorientation is still a Killer.

Back in 1998 we said so in the lead article of an issue of the Human A.D. The U.S. National Transportation Safety Board said so too in Reports SR/89-01 and SS/88-01 – the latter of which is a good read which still has some applicability today. Transport Canada said the same thing in Report 90-SP002. And a quick look at all of the NTSB Preliminary Reports of 2004's U.S. Civil Helicopter fatal accidents tends to say so too. Here are excerpts from several.

NTSB Preliminary Report FTW04FA097.

"On March 21, 2004, approximately 0220 central standard time, a Bell 407 air ambulance helicopter, was destroyed when it impacted the terrain while maneuvering in reduced visibility conditions near Pyote, Texas. The instrument rated commercial pilot, a flight paramedic, an infant patient, and a passenger sustained fatal injuries, and a flight nurse sustained serious injuries…Night instrument meteorological conditions prevailed throughout the area for the 14 Code Part 135 on-demand air ambulance flight for which a company visual flight rules (VFR) flight plan was filed. The flight originated from the Big Bend Regional Medical Center, near Alpine, Texas approximately 0143 to transfer the patient to the University Medical Center, near Lubbock, Texas.

According to company personnel, the pilot departed the base hangar at the Odessa-Schlemeyer Field near Odessa, Texas, and arrived at the Medical Center Hospital (MCH) in Odessa to pick up the flight nurse and the paramedic for the flight to Alpine…At 0143, the patient and passenger boarded the helicopter, and the flight departed Big Bend Regional Medical Center en route to Lubbock (Lubbock is approximately 220 miles north-northeast of Alpine). At 0219, the pilot contacted the MCH dispatch and began a position report when he stated, "…hold on a minute dispatch, give me something to look at." There were no further communications from the helicopter.

Approximately 0330, the MCH dispatch facility notified the Texas Department of Public Safety (DPS) of a possible missing helicopter. Due to weather in the Odessa area, the DPS helicopter could not initiate a search until approximately 0600.

At 0623, the helicopter was located by DPS helicopter-rescue personnel approximately 6 miles south of Pyote. The helicopter initially impacted in a soft field on a measured magnetic heading of approximately 170-180 degrees. The wreckage distribution was approximately 450 feet in length, and all components of the helicopter were located in the debris field. There was no post-impact fire."

NTSB Preliminary Report MIA05FA008.

"On October 20, 2004, about 0043 central daylight time, a BO-105…as a Title 14 Part 135 emergency medical services (EMS) flight from Santa Rosa Beach, Florida, to DeFuniak Springs, Florida, crashed in Choctawhatchee Bay, near Santa

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INSIDE HELIPROPS

Rosa Beach. Instrument meteorological conditions prevailed at the time and no flight plan was filed. The helicopter was destroyed and the commercial rated pilot, paramedic, and flight nurse were fatally injured. The flight originated from Santa Rosa Beach at 0041.

Personnel from the Walton County, Florida Emergency Operations Center, stated that at 0021 they received a call…requesting the …helicopter to transport a patient from DeFuniak Springs to a hospital in Pensacola. The dispatcher then contacted the pilot and advised him of the request. The pilot stated he would have to check the weather and get back to him. At 0035 the pilot called back and stated they would take the flight. At 0041, the helicopter called via radio and reported they were airborne with 3 persons on board, 2 hours and 20 minutes of fuel, and an estimated time en route to the hospital of 10 minutes. At 0043 the helicopter called via radio and reported that due to weather they were returning to base. The dispatcher did not talk with the flight after this. At 0050 the dispatcher… believed the helicopter was back at base due to the short flight time. At 0610, the relief pilot that was coming on duty called the Emergency Operations Center and advised that the helicopter was not at the base. Search and rescue operations were initiated and the wreckage of the helicopter was located in Choctawhatchee Bay at about 0820. The wreckage was located about 1 mile east of the Highway 331 bridge, and 1 mile south of the north shore of the bay. The wreckage was in about 10 feet of water."

NTSB Preliminary Report DCA04MA030.

"On March 23, 2004, at about 1918 central standard time an S-76A helicopter crashed about 30 minutes after takeoff from Galveston International-Scholes Airport, Galveston, Texas. The helicopter had been contracted to take workers to a drillship. The 2 crewmembers and 8 passengers onboard were fatally injured. The helicopter was destroyed due to impact forces with the water. No emergency or distress calls from the aircraft were reported before the accident.

The wreckage was located about 70 miles southeast of the departure airport. Limited radar data is available for the accident flight. The helicopter had a cockpit voice recorder (CVR) on board…The quality of the CVR was poor. There was not a flight data recorder on board, nor was one required."

NTSB Preliminary Report SEA04MA167.

"On August 21, 2004, approximately 2358 pacific daylight time, a Bell 407 helicopter operating as an air ambulance, impacted mountainous terrain in cruise flight and was destroyed about 27 miles southwest of Battle Mountain, Nevada. The airline transport pilot, the two medical crewmembers, the infant being transported and the patient's mother were fatally injured…The purpose of the Part 135 flight was to transport the infant from Battle Mountain Hospital to Washoe Medical Center in Reno, Nevada. Dark night meteorological conditions prevailed for the 2338 departure from Battle Mountain Hospital. No flight plan was filed.

The pilot of the helicopter reported his departure from Battle Mountain Hospital to Lander County dispatch. There were no further radio communications from the helicopter…The last radar data shows the helicopter flying a magnetic course of about 232 degrees. The radar data are consistent with the helicopter flying a route commonly used by the operator, direct from Battle Mountain Hospital to Derby Field Airport, Lovelock Nevada, then direct Washoe Medical Center in Reno.

When the helicopter did not arrive at Washoe Medical Center, a search was initiated. The wreckage of the helicopter was located at about 0830 PDT on August 22, 2004. The accident site was along the direct course line from Battle Mountain Hospital to Derby Field Airport. The helicopter impacted rugged mountainous terrain on the eastern slope of the Tobin Range…The helicopter came to rest in an area surrounded by rock outcroppings on an upslope of about 60 degrees. All major components of the helicopter were accounted for in the main wreckage area. The debris path was along a magnetic bearing of 230 degrees.

According to the U.S. Naval Observatory, the moon set in Battle Mountain at 2238 PDT on August 21, 2004. Preliminary review of…data by an NTSB

meteorologist indicates that at 2345 PDT, there was cloud cover in the accident location."

Now, the NTSB has yet to rule on the probable cause of these accidents, and it is not our responsibility to do so. But it is of interest that in these and other 2004 fatal accidents some of the common factors were: dark night, and locations with few on no ground lights. Factors that can easily be the ingredients that lead to Spatial Disorientation.

Unfortunately things haven't changed much in the last hundred years. Pilots continue to kill themselves, far too often, in Spatial Disorientation accidents.

Why?

Why are Spatial Disorientation accidents so deadly?

Spatial Disorientation can be either the failure of the pilot to recognize his aircraft's motion and attitude, and/or the failure to recognize his position with respect to the surface of the earth.

Spatial Disorientation is frequently, but not always, associated with VFR flight into low visibility or IMC conditions. Then when continued attempts to maintain visual contact with the surface fail, aircraft control is lost; or control is maintained until flying into the terrain. These out-of-control, or controlled-flight-into-terrain (CFIT) accidents are usually violent crashes, making most of them fatal accidents. Because these are high-energy impacts compared with other types of accidents, Spatial Disorientation accidents claim a disproportionate number of fatalities.

It appears that the most common factors accompanying Spatial Disorientation accidents are night and weather.

Do you fly at night?
Do you contend with poor weather?

If you do, then you had better have the tools in your arsenal to be able to prevent or overcome Spatial Disorientation. Your life may depend on it.

Orientation.

We humanoids are land-based creatures. We manage to move about and jump around on the surface of the earth without thinking much about our balance and orientation. Our three orientation systems - Visual, Vestibular, and Proprioceptive – work great, and allow us to easily maintain balance and orientation when in visual or physical contact with the earth. Spatial orientation relies on the effective perception, interpretation, and integration of Visual, Vestibular, and Proprioceptive sensory information. That does not always happen.

In flight, the body's spatial orientation systems may fail to provide the information required for prolonged flight. Sensory conflicts and visual illusions may occur that make spatial orientation difficult, or in some cases, impossible. An example of a sensory conflict is one system telling the brain that the wings are level; while another system reports right wing down.

Let's look at the systems we have to maintain balance and orientation. They are, as mentioned above, the Visual, Vestibular, and Proprioceptive systems. These are separate and independent systems that each can provide some level of balance and orientation.

Visual System.

This is the one system a pilot must have. There are no blind pilots. You must see to fly; and furthermore you must see the right stuff to maintain orientation.

By definition for this article, "VFR flight" is when the pilot can look out the window for all of the necessary information to determine movement, altitude, speed, attitude, direction of flight, and position with respect to the surface of the earth and clouds.

When the air outside the cockpit does not permit the pilot to see the sky or the earth (IMC conditions), the pilot must gather the appropriate data from the instrument panel. He must continuously scan various instruments such as, the airspeed indicator, altimeter, vertical speed indicator, attitude indicator, turn and slip indicator, compass,

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engine power settings, control positions, and navigation instruments; decode each piece of data every time he scans it; and then integrate these separate pieces of data to form a three-dimensional mental picture that tells him his position, altitude, height above terrain, speed, direction of flight, etc - all of the things that he could get by a quick glance out the window when it is VFR. Flying raw data in IMC takes a lot more work than flying VFR.

Consequently it should come as no surprise that pilots who are not adept at instrument flying get themselves in trouble when they lose external visual cues.

Our eyes have two ways of seeing – Central Vision, and Peripheral Vision.

Central vision is our default way of seeing – if we don't force ourselves into the "Stare Mode," we see with central vision. If there is adequate ambient illmination, central vision does a great job of providing detail and color. This is the vision that is used to find the detail being looked for outside the cockpit in VFR flight or inside the cockpit in IFR flight. Central vision requires thinking to process each detail that is looked at.

Peripheral Vision is principally involved with providing the sensations of movement, balance and orientation. Peripheral vision, as we learned during the story about night vision, works better than central vision in low ambient illumination.

Peripheral vision does some other neat stuff for us. It allows us to walk and chew gum at the same time. When we are using central vision to see detail, peripheral vision allows us to move about without walking into a wall or stumbling over a chair. Peripheral vision allows us to drive a car and talk on a cell phone at the same time. Peripheral vision is free – we don't have to think about our balance and orientation.

Vestibular System.

This is the system within each of our inner ears. The main components are the Semi-Circular Canals, and the Otolith Organs. These organs of balance have very specific roles. The semi-circular canals sense angular acceleration – pitch, roll and yaw. The otolith organs sense linear acceleration – longitudinal, lateral, and vertical. Whenever the head is accelerated in any of these six-degrees of motion, the semi-circular canals and the otolith organs report such movements to the brain. These are sensitive organs, but never-the-less the accelerations must exceed a threshold for the sensors to be activated. Consequently very low angular or linear accelerations may never be detected.

This system was not developed to be a primary system to maintain orientation in flight. It alone cannot provide reliable, long-term orientation information while in flight.

For instance, when entering a standard-rate, coordinated (ball in the center) turn from straight-and-level flight, the initial acceleration in the turn disturbs the sensors in the semi-circular canals, sending a signal of such a turn to the brain. If however that standard-rate turn is maintained for a long enough time, the semicircular-canal sensors return to their pre-turn position and discontinue sending a "turn-signal" to the brain. As far as the vestibular system knows, the aircraft is "wings level" even though it is in a turn - a false sensation that could lead a pilot into trouble. These false vestibular system signals are the basis for some confusing cases of spatial disorientation that go by the names "Graveyard Spiral," "Leans," and "Coriolis Effect.

Proprioceptive System.

This is essentially our whole body being acted on by gravity. Some parts, such as the feet and legs are more sensitive in being able to determine balance. This system works great when we are walking around on the surface of the earth – it alone can always tell which way is down. However,

when in flight, this system alone cannot provide reliable long-term orientation information.

For instance, when entering a standard-rate, coordinated-turn from straight-and-level flight, this (seat-of the-pants) system will feel a higher G-force. This G-force is "vertical" with respect to the seat-pan and body, but not "vertical" with respect with the earth. What feels like "up" to the body, may be considerably different from true "up" - another false sensation that could lead the pilot into trouble.

While in flight, the vestibular and proprioceptive systems alone cannot reliably give a pilot the sense of a true horizon.

Disorientation.

The most common scenario of a pilot getting into trouble with spatial disorientation is night VFR into IMC flight. For our definition, this is a situation of a pilot trying to look out the window to get the required data for orientation, but the necessary external visual cues are not there. The necessary external visual cues may not be there for either of two reasons: (1) the ambient air obscures vision (fog, clouds, snow or rain), or (2) the visibility is good, but there are no visual cues (no lights on the ground/water, and the stars/moon are obscured by clouds). When a pilot experiences solid IMC conditions – in the clouds, and there is no doubt about it – the remedy is usually quite clear; get on the instruments and fly to where it is VFR or shoot an instrument approach to VFR conditions.

The other situation is more insidious - as when the ambient air does not obscure the earth/sky, and the external visual cues are few or non-existent. In such a situation it is not uncommon for the pilot to continue to try to look out to find external visual cues. But when that fails, the signals from the vestibular and proprioceptive systems may be the only cues used to determine orientation (a horizon) and to make control inputs. And as we have already established, these systems alone CANNOT PROVIDE RELIABLE LONG-TERM ORIENTATION INFORMATION, and spatial disorientation may occur.

There are some other special situations that can cause a rapid onset of spatial disorientation.

(1). Brownout or whiteout are conditions near a landing or takeoff hover when dust or snow create your own temporary, personal brown or white cloud. This may last for only a few seconds; but that may be enough time during which to lose visual contact with the ground, and control of the helicopter.

(2). Calm water. A seemingly innocent situation is making an approach to a hover over calm water. If there are no other visual cues in your immediate area, smooth, glassy water can make it very difficult to judge your height and speed over the water. That makes it very easy to find yourself backing-down at a high hover, or flying into the water.

(3). Flying suddenly from a situation rich in visual cues to one where there are no cues is insidious. A night takeoff from a lighted helipad over an open field, flying at night from the shore-line out over open water, and flying at night from the lights of a city out over a wide expanse of open forest/water/swamp/field.

Because each of these are conditions in which external visual cues suddenly disappear, the pilot will continue look for external cues for a while, and the remedy is not immediately apparent. Few VFR helicopter pilots know how to do an instrument takeoff. Few VFR helicopter pilots are prepared to make an instrument go-around from a visual approach to water. Few VFR helicopter pilots want to transition to instrument flying when in VMC.

In any case, you must be prepared to handle the situation.

You must have a plan ready when one of these situations arise. You must be able to

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cope with it to survive. You must recognize that your orientation systems can fail you. Your vision may not get enough of the right external cues, and your vestibular and proprioceptive systems can generate false signals. It is normal for these systems to works this way. They were not developed for flying.

Remember, you must see to fly; and furthermore you must see the right stuff to maintain orientation.

There is an old aviation saying that goes something like:

> ***"The mark of a superior pilot is one who never puts himself into a situation that will require exceptional piloting skill to get out of."***

That means solid preflight planning, a realistic assessment of the risks and your abilities, and the strength to refuse/abort a mission.

One other thing – have you considered using night-vision-goggles in your operation?

A Comment from a Reader

"One point that you made (in the last issue) which really struck a chord with me was the one about why the accidents happen to the Cessna 150's and not the Boeing 747's, why the R-22's and JetRangers and not the S-76's and Pumas. The folks who control the larger machines cannot afford to have their investment operated in any other way but properly. They set the operating parameters to control the operations, train people how to do it correctly, and monitor their performance to make sure it's done correctly.

There is no reason that the same process can't happen for the R-22 and JetRanger operations. It will be a much smaller system when you are dealing with two Cessna 150's than dealing with thirty Boeing 747's. Hazard recognition, procedure development, training and monitoring can happen on the small scale as well as the large scale as long as the small operator knows about this process.

There I Was...

412.

I had two recent occasions in which Spatial Disorientation was the factor that almost caused two serious accidents. Each of them were in our 412, which is an excellent platform for IFR flying – AFCS/Flight Director which can fly the aircraft very well

On the first incident I was the copilot – with an Instrument Rating - in the left seat. In the right seat was an experienced but not Instrument Rated pilot. This was a night mission. Our mission was to rendezvous with a ground unit at a remote location south of Lake Okeechobee where there was an injured person in a car (we later found that this person was already dead). We departed our facility on the east coast of Florida at about 0100 and headed west. If you would look at a map of Florida you would see that all the way from Melbourne to the southern tip of the state there is swamp land just a few miles to the west of the heavily populated east coast. Lake Okeechobee and the Florida Everglades cover miles and miles, with vast areas of swamp grass, alligators, and only scattered road and towns. That night there were no stars, nor a moon. It was a high overcast, with good visibility. The pilot was hand flying the aircraft, I was sort of navigating, and watching what was happening. Initially we followed a road with the occasional car lights. That was sufficient for VFR flying. But to get to the scene, we turned away from the road out over the dark swamp.

It was very dark out there and now all of a sudden it was not OK for VFR flying.

Well, a very short time later the aircraft began to make random pitch, roll and power changes, resulting in airspeed and altitude changes. It was not apparent why the pilot was making these control inputs and allowing these attitude/altitude

/airspeed excursions. He never said a thing. I made some comments about attitude and power, and suggested using the flight director, but I didn't get any verbal response, nor did the aircraft gyrations stop. When the aircraft turned into a hard right, descending turn I got on the controls. This was a steep turn with a rapid descent. The guys in the back were yelling "Pull up! "I had to fight the pilot, who had a firm grip on the controls, and would not let go. I had to punch him on the arm to get through to him to let go of the controls. I was able to correct the attitude, stop the descent, climb, and turn back toward home. Later the crew told us that as we pulled up, the skids were just over the top of the swamp grass.

"The guys in the back were yelling "Pull up! "I had to fight the pilot, who had a firm grip on the controls, and would not let go. I had to punch him on the arm to get through to him to let go of the controls. "

The other incident was quite similar. This time I was the copilot in the left seat with an Aircraft Commander who was also instrument rated. Again, even though we had this 412 with great IFR equipment, he was hand-flying the aircraft. Almost the same thing. Dark night, heading west out over the Everglades. This time we stepped down in a descent to stay under the lowering ceiling. With decreasing visibility, and absolutely nothing on the ground to be seen, he lost it. We went through increasing pitch, roll and power changes. This time, when we began a descending right turn, I didn't hesitate to speak up and take over the controls. We aborted the mission and flew home.

Apparently in each of these cases the pilot continued to look out to find visual references on the ground, and while doing so made control inputs that followed his "seat-of-the-pants" feelings rather than using the instrument and flight director."

Birds.

One day when I was test-flying for Rolls Royce in England I had a very interesting experience. I had just taken off to do some work in a Westland Scout helicopter, and as I moved out I heard on the radio that one of our aircraft, a Hawker Siddely 125, was inbound, about 12 miles out, on its final approach. At the same time I noticed that an enormous flock of Starlings fly in and settle on the grass beside the runway in use. Knowing that Starlings and jet engines are not compatible, I flew toward this flock of several thousand to scare them away. Just as I approached, they saw me and took off in a graceful curve to land on the other side of the runway.

This was too big a challenge, so I increased speed and did a climbing turn to come back on them. My flight test observer encouraged me by saying,"Go get them." I dived at them, and at the last moment, thought that I would enhance their fright if I was to pull up and go back to the other side of the runway, as they had done to me. Suddenly, I found myself in the middle of an enormous flock of starlings. The rotor had sucked down birds in a black torrent. They came down past the cockpit in a screaming, shrieking mass. I could hear them! In one nano-second I could imagine 6-700 entering the engine and taking that out. I could imagine another 2-300 were going to hit the tail rotor, upset its balance and take that out along with the tail rotor gearbox and I was going to end up a smoking heap in the middle of the runway.

At that stage I completely lost my cool and shouted "AAAAAHH." Apparently I did enhance their fright, as hundreds must have, in

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unison, dropped their excrement. In a flash the aircraft was covered in bird-Doo. I couldn't see out. I hit the windshield wiper, but that only spread the mess. Fortunately I managed to flick open a sliding side window, saw the ground, and came to a shaky hover about 200 feet up. My observer slumped in his seat and looked pale and sickly. I was somewhat chastised too. I hover taxied back to dispersal and shut down, as it was necessary to hose the helicopter down with a high-pressure hose. It was a mess, and the strange thing about it was that there were no signs of any feathers or carcasses anywhere on the aircraft! I was totally amazed. We resumed our flight about twenty minutes later, after my observer disappeared to reorganize himself. There were also no signs of starlings in the vicinity."

Many of the "There I was …" stories we receive are near-accidents. The one below is a good one. A story that shows how dedication, skill, training, perseverance, innovation and technology can be combined to save lives.

412.

At approximately 1155 on 18 October, 2004 the combined efforts of the NYPD Aviation Unit and Scuba Team affected a dramatic rescue. The crew included PO William Schub, PO William Klein, PO Brendan Galligan, and Scuba divers PO Michael Egan, and PO Francis Vitale.

PO Sean Carroll received a telephone notification from the U.S. Coast Guard, who requested the assistance of the NYPD SAR Team. The USCG received a Mayday call from a sinking 27 foot sport fishing boat in rough seas off the New Jersey coast. PO Carroll believed the reported latitude and longitude of the sinking boat was inaccurate and requested further information. PO Carroll was able to plot a target location for the initial search. These new coordinates revealed the rescue scene was 23 miles southwest of Rockaway Beach, New York, and a substantial distance from the originally reported position.

The victims would be particularly difficult to find in the rough seas. The Scuba team would have to enter the water in a known shark infested area.

Without delay, the officers departed Floyd Bennett Field to search the open waters. It was learned in flight that the victims' boat had taken on water and sunk. The cold water temperature increased the peril of the three victims who were now in the water. The victims would be particularly difficult to find in the rough seas. The Scuba team would have to enter the water in a known shark infested area.

Upon arrival at the adjusted coordinates, the crew conducted a search, and sighted a sparsely scattered debris field over a wide area of ocean. Using their expertise, the crew implemented a specific search pattern that considered the drift of the debris versus the drift of the victims. Shortly the crew spotted an oil slick caused by the stricken vessel. The area was meticulously searched, and what was initially thought to be more debris, upon closer investigation, revealed the three victims floating in 3-4 foot waves. They were clinging to an ice chest with only their heads visible.

PO Galligan directed the pilot, PO Schub, into a pre-rescue hover approximately 10 feet from the victims and 4 feet above the waves. In this situation, the pilot's trust in the crew-chief's direction is critical. PO Galligan briefed the Scuba team, and positioned himself on the right skid, outside the aircraft so he could deploy the divers.

With the divers deployed, the aircraft was repositioned for the rescue. Divers PO Egan and PO Vitale assessed the physical condition of the victims and

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Q& Your Answers...

In the last issue we asked pilots to tell us about their,

Q *What in your opinion will be the cause of the next accident in your operation?*

We received lots of responses.
Here are some answers – most of which were very brief.

A "Off-site landing wire strike."

"Complacency. Plain and simple not paying attention to what you are doing. I work for a dual category flight department - helicopters and fixed wing – that is professional and well maintained and compensated. We haven't had an accident since 1982. But since we're good at what we do, we tend to get complacent."

"Pilots failing to follow established procedures."

"At night, landing on a dolly."

"Skill demand of the mission will exceed the skill of the pilot."

"Buzzard strike."

"Passenger getting in and out of the helicopter. Flight crew being distracted by passenger or someone before or during preparation for flight.."

"Inattention. Preoccupied with things other than flying the aircraft."

"Complacency of both pilots and mechanics. The organization has had a good record of safety for a long time, and now too many practices are taken for granted, i.e. inspections, preflight checks, training, etc."

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What is your Answer?

"Tell us the funniest thing that has ever happened to you in your helicopter flying experience.?"

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
HELIPROPS Manager
P.O. Box 482
Fort Worth, Texas 76101

There I was (con't)

immediately recognized signs of hypothermia. They decided that additional equipment would be required for the safe removal of the victims. PO Galligan delivered a rescue raft which was used as a staging platform for the hoisting operations. At the direction of PO Galligan, pilot Schub kept a steady over and position despite the absence of any steady visual references on the water. PO Galligan began the lengthy and physically demanding hoisting operation of all three victims as the Scuba Team individually loaded the victims into the basket. The hoist operation alone took 25 minutes to safely get all the hypothermic victims aboard. First aid was administered by PO Galligan. The copilot PO Klein forwarded the physical conditions of the victims to the ground personnel coordinator, PO Carroll, who in turn forwarded this information to New York Fire Department EMS personnel who were standing by at Floyd Bennett Field. This hoist rescue operation involved team coordination of all members of the search and rescue crew. It required maintaining an accurate position over the victims and monitoring each other's safety while battling the elements of wind and waves.

The three victims had been in the water for 40 minutes and were in imminent danger.

As a result of these officer's actions the lives of three persons were saved in a dramatic fashion. The performance exhibited by the officers involved in this rescue was exceptional.

Q & A (con't)

"Pilot error – weather related."

"Inexperienced pilots placed in the dangerous position to attempt night medevac on scene landings."

"Mechanical failure. The fleet of aircraft is maintained by four mechanics not directly employed by our department. They work on two Cessnas, one Piper, three Bells, one Hughes, and one Beechcraft. Too many aircraft and too few mechanics."

"Spatial disorientation – night – with or without NVG's and losing orientation with close proximity to mountains/high terrain."

"Engine failure over thickly wooded areas and having to pick a place for an emergency landing."

"Poor Judgment."

"Mechanical Failure."

"Being too much in a rush."

"Lack of experience."

"Continued flight into IMC."

"Exceeding personal limitations."

"Lack of proficiency. Too expensive to maintain the standards that make pilots the most comfortable."

Shocking News About Landing On Dollies!

If your helicopter lands on a dolly read on. You might get the shock of your life!

Most portable landing platforms are constructed using a wood deck supported on a steel frame and hard rubber wheels. Does that describe the one at your facility? Is that platform electrically grounded to earth? If you're not sure, it probably isn't. Someone, maybe you or your customer, can get a very uncomfortable jolt of static electricity. That's the good news. The bad news is, if the helicopter isn't discharged all those stray electrons have nowhere to go. Electrical devices don't react well to mega-volts of electricity knocking on their back doors (the ground circuit) looking for a place to discharge. Reverse current protection can breakdown, resulting in abnormal operation and expensive failures. Built up static electricity has also been suspect as the cause for unintentional firing of squibs attached to floats and fire bottles. Now for the worse news, have you ever taken a fuel sample from a helicopter while it was on the dolly? A high-energy static discharge can quickly jump between the fuel and to ground.

You can avoid an electric and financial shock, or a hazardous spark, easily with a grounding plate. Bolt a piece of steel or other good wear resistant electrical conductor to the top surface of your landing platform. Make sure it will contact the landing gear no matter how off center someone might land. Most importantly, install the plate so as to avoid any possibility of snagging a skid shoe (or a persons shoe). From this plate secure a chain or other conductive link that is always in contact with the tarmac. A heavy chain that is a few inches longer than the distance from the grounding plate to the tarmac assures the helicopter safely sheds its high-energy static charge at each landing.

There is only one remotely good thing about a dolly not being grounded. That's the reduced risk (not prevention) of a lightning strike while the helicopter is on the platform outdoors. Especially here in South Florida, "The Lightning Capital Of The World," when you leave an aircraft on the tarmac the possibility of a lightning strike exists. The best way to prevent this is by locating the aircraft inside a hangar. If that is not possible, suspend the grounding chain off the tarmac. You must also eliminate any other possible routes to ground such as the dollies towing tongue or an A.P.U. However to avoid a shocking reminder after flight, don't forget to place the chain back on the ground prior to take-off. A red flag tied to it may help to remember.

"There is only one remotely good thing about a dolly not being grounded. That's the reduced risk (not prevention) of a lightning strike while the helicopter is on the platform outdoors."

Please, install a grounding plate soon. Don't put this small but important task off. Someone could get a severe shock to themselves, his or her wallet, or worse!

W. Paul Lusker II
Bell Helicopter
Senior Customer Support Representative
South Florida, the Caribbean and Bahamas

HUMAN A.D. Heliprops

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The primary objective of the **HELIPROPS** program and the **HUMAN A.D.** is to help reduce human error related accidents. This newsletter stresses professionalism, safety and good aeronautical decision-making.

Letters with constructive comments and suggestions are invited. Correspondents should provide name, address and telephone number to:

Bell Helicopter Textron Inc.
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P.O. Box 482
Fort Worth, Texas 76101

or e-mail:
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