



## Aviation Safety

# Vortex

Learn from the mistakes of others; you'll not live long enough to make them all yourself . . . **Issue 5/2000**

## ***I Don't See Anyone—I Guess There's No Traffic***

The helicopter, with only the pilot on board, was about 15 mi. from landing at a small northern Canadian airport. It had been a long hard day, and the pilot was looking forward to securing his machine for the night and getting to the motel. The weather was marginal for visual flight rules (VFR) flight, but he had seen worse during the nine-hour ferry flight he was about to finish. According to his map, the airport was just over that ridge-line. As he passed over the ridge-line, he spotted the airport about three miles ahead. A straight line from his position to the airport terminal would take him across the approach to what looked like Runway 36, about a half mile back from the button. He looked for other aircraft in the circuit but saw none, which wasn't strange as the visibility was about three miles and the ceiling looked to be about 800 ft. As he approached the extended centreline of Runway 36, he briefly wondered whether there was an instrument approach to this airport, but he quickly dismissed the thought since he



hadn't heard any radio transmissions about instrument flight rules (IFR) traffic. His flight path took him across the extended centreline at about a 45° angle, and the pilot did not see or was not aware of the presence of the airliner. The revelation only lasted for a split second prior to his death. The crew of the other aircraft had about three seconds to see and try to react after they broke out of cloud, but they were unable to avoid smashing head-on into the helicopter. The helicopter pilot died instantly along with the other flight crew, and they were followed some eight

seconds later by the rest of those on board as the airliner nosed over and smashed into the approach lights at 145 kt. There were no survivors.

When the accident investigators sifted through the wreckage they found the helicopter radio, and the frequency selected did not correspond to any at the airport or, for that matter, any from that part of the country. Further investigation determined that the frequency had been used at this airport up until three years previous. Nothing else was recognizable from the helicopter cockpit, except they did find a *Canada Flight Supplement* (CFS) with the pilot's name on it. It was current and in amazingly good condition.

This accident didn't take place, but is it just a matter of time before it does. As of Sept. 15, 2000, there had been 29 reported regulatory infractions (communications procedures) involving helicopters at Canadian aerodromes. I say *reported* because there is no way of knowing how many breakdowns in airmanship have taken place in aerodrome traffic frequency (ATF) areas and at aerodromes that have nothing. You're just as dead if you hit someone and lose your rotor over your uncle's farm as you are if you do so over Lester B. Pearson International Airport.

Here are a few examples of the sort of things that are happening this year

and a couple of good/bad examples from years past:

- The MEDEVAC helicopter departed the hospital having received an IFR clearance on the telephone and did not contact the flight service station (FSS). The hospital is inside a mandatory frequency (MF) area.
- The pilot of the helicopter landed and shut down beside a local area hotel. The next morning it departed and again returned later in the day to the same location. When the pilot did eventually contact the FSS, he was informed that the hotel was inside four miles from the airport and that the airport had an MF. The pilot stated that he thought he was outside the MF.
- The crew of a Bell 412 departed a northern Canadian aerodrome without attempting to contact the MF or to advise local traffic of their intentions.
- The 206 pilot did not call on the MF as he was flying inbound to a northern aerodrome. An HS 748 was also inbound at the same time, and its pilot reported seeing the helicopter and the potential conflict was avoided.
- The pilot departed without calling the MF and landed a short distance away on a forestry pad. He later stated that he had called thinking he was on the FSS frequency when, in fact, he was on

the forestry frequency. When the forestry people responded, he mistakenly thought they were the FSS.

- The pilot of an airliner reported 20 mi. out and requested a traffic advisory. He was informed that there was "no reported traffic." At five miles final for landing, the pilot reported that he had the "helicopter traffic in sight." The helicopter pilot made his initial call on the MF about four miles from the airport as he was crossing the approach to the runway the airliner was lined up to land on. No evasive action was required, but it was close.
- The pilot and his Bell 206 were flying revenue sightseeing trips at a local fair in western Canada. On the second day the pilot flew to the nearby airport for fuel and then departed back to the fair ground. Toward the end of the second day, the pilot finally called saying that he was unaware that the aerodrome had an MF. The CFS clearly states the existence and defines the size of the MF.
- The 206 conducted numerous takeoffs and landings, well inside the MF but off the airport proper, and at no time did its pilot contact the community aerodrome radio station (CARS) MF.
- At no time did the pilot make a call on the CARS



The Aviation Safety Vortex is published every two months by Civil Aviation, Transport Canada, and is distributed to all Canadian licensed helicopter pilots. The contents do not necessarily reflect official policy and, unless stated, should not be construed as regulations or directives. Letters with comments and suggestions are invited. Correspondents should provide name, address and telephone number. The Vortex reserves the right to edit all published articles. Name and address will be withheld from publication at the writer's request.

Address correspondence to:

Editor, Bob Grant

Aviation Safety Vortex

Transport Canada (AARQ)

330 Sparks St.

Ottawa ON K1A 0N8

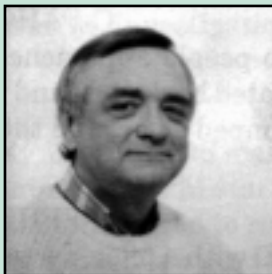
Phone: (613) 990-5443

Fax: (613) 991-4280

E-mail: grantb@tc.gc.ca

Internet: http://www.tc.gc.ca/aviation/sys-safe/newsletters/vortex/index.htm

Readers are encouraged to reprint or copy but should acknowledge Aviation Safety Vortex as the source. Please forward one copy of the reprinted article to the Editor.



Bob Grant

Regional System Safety Offices

- Atlantic** Box 42  
Moncton NB E1C 8K6  
(506) 851-7110
- Quebec** 700 Leigh Capreol  
Dorval QC H4Y 1G7  
(514) 633-3249
- Ontario** 4900 Yonge St., Suite 300  
Toronto ON M2N 6A5  
(416) 952-0175
- Prairie & Northern**
  - Box 8550  
344 Edmonton St.  
Winnipeg MB R3C 0P6  
(204) 983-2926
  - 61 Airport Road  
General Aviation Centre  
City Centre Airport  
Edmonton AB T5G 0W6  
(780) 495-3861
- Pacific** 4160 Cowley Cres., Room 318  
Richmond BC V7B 1B8  
(604) 666-9517

Sécurité aérienne — Vortex est la version française de cette publication.

MF. The helicopter was observed to overfly the button of the active runway while a commuter airline aircraft was on short final.

- Weather was below VFR, but the pilot did not request special VFR till he was little more than three miles from the aerodrome, stating that he had tried to contact the MF but was unable to because he was using the wrong frequency. The pilot erred on two counts: he entered the MF without contacting the FSS, and he proceeded into the zone in below VFR weather.
- The pilot called on the edge of the MF stating that he thought the FSS was closed for the night. Not according to the CFS it isn't.
- The 212 departed Canada for a destination in the United States without filing a flight plan.
- The 214 departed Canada (this time it was a Canadian-registered helicopter) for a destination in the United States without filing a flight plan.
- The 206 arrived at the small northern aerodrome without having made any contact on the MF frequency. He stated when questioned that he had tried calling and had received no answer. He had called on a decommissioned frequency. He was using an out-of-date

CFS. The aerodrome is serviced by instrument approaches.

- The crew of the helicopter was on a VFR trip through a congested part of Canadian airspace. They entered the zone at their destination and, at about three miles back from the airport, they called the MF and were given traffic advisory information. After they had landed they were advised of the reporting requirements when operating in an MF.

Two hours later the same day, the same helicopter was observed taxiing toward the active runway without having made any radio calls. Communications were established before the aircraft entered the runway, it departed and called clear of the zone without any further problems.

- The helicopter pilot was on a VFR flight that (by direct flight) took him through one of Canada's busiest air traffic areas and within four miles of Canada's largest airport. He contacted a sector controller and was immediately told to alter course as he was inside the airport control zone. The pilot informed the controller that he was unable to comply with the westerly course change as it would put him into instrument meteorological conditions



(IMC). He also added that he could only continue southbound. He was quickly switched over to the tower frequency, he where the pilot again stated he was only able to proceed south toward his destination, still 25 mi. further south. The tower controller advised the pilot that, because of the weather, his only alternative was to land at the airport, which he did without further problem.

Weather reported at the airport was visibility five miles in fog with a 600-ft overcast ceiling.

When the pilot made his initial call to the sector controller he was five miles north of the airport, which put him two miles inside the control zone.

Just to show you that I'm not trying to pick on rotary wing pilots of the new millennium, I'll give you one from a few years previous.

- The incident took place at a small northwestern airport about five years ago. The weather was borderline VFR with marginal visibility. On final was a SAAB 340 with 20 people on board. The SAAB had done an instrument approach and was lined-up for landing when an R 22 flew in front of it on its way to the ramp. There was enough separation that an overshoot was not required. The FSS

had not been in contact with the helicopter nor had anyone else since the pilot was not on any frequency in use at that airport. When questioned about his actions, the pilot stated that he had called and when he received no answer, he continued on into the zone and headed directly across the runway to the ramp. The pilot had been calling on a decommissioned frequency (three years past) and had acquired the frequency from his global positioning system (GPS) database (over three years old). The pilot also stated that he had a current CFS in the helicopter, sitting on the other front seat, but that he had been to busy coming in to refer to it. So much for pre-flight planning.

If we follow a few basics these incidents will decrease considerably:

- Read and know the *Canadian Aviation Regulations* (CARs) because they pertain to procedures that must be followed at uncontrolled aerodromes. This information can be found in the *A.I.P. Canada* and is repeated in a condensed form in the CFS.
- Follow the procedures because they are, in fact, regulations and not guidelines.
- If you make a radio call and don't receive a response, stay outside the zone till you do.

- Have in your possession a current CFS and current maps so you are aware of **all** the control zones along your route.
- Know the weather limits for the different classifications of Canadian Domestic Airspace and know what the classifications are.
- Remember that at uncontrolled aerodromes you don't have the added protection of radar to keep you from bumping into things, and you don't have someone in a control tower to help out.
- One excellent method of staying out of the way of other aircraft is to pass accurate information over the radio (that's assuming you select the correct frequency).
- Maintain a good visual scan.

*The occurrences mentioned above represent only a small percentage of what's going on out there in uncontrolled airspace. There is no way of keeping track of similar types of incidents taking place in and around ATF areas and at aerodromes that have no procedures at all. If we follow the procedures and do not violate the CARs, we can drastically reduce the number of these incidents. If, on the other hand, we continue the way we appear to be heading, we'll have something like what happened "just over that ridgeline." Please prove me wrong. —Ed. 🛩️*

## ***It Was a Dark and Dreary Night***

*by Shawn Coyle, Engineering Test Pilot, Transport Canada*

What a great time to learn about using the Fire-Fly on the N model Huey: overcast, big military range area with no lights, not much wind, and a reasonable proficiency at flying the machine during the day and under instrument flight rules (IFR). I was just transitioning to the Twin, having completed the basic helicopter course, and was about halfway through the Twin Huey course.

That night, we were being trained on the use of the Fire-Fly searchlight system. The Fire-Fly predates the Night-Sun by several generations and was a big cluster of landing lights that could be adjusted in beam width by the operator in the back. One of our trusty and very experienced flight engineers was the Fire-Fly operator, James (we'll call him) was the instructor pilot and I was the student.

We briefed, started up, did the normal checks of the aircraft, checked the Fire-Fly, and launched into the Stygian blackness of an overcast night in the Gagetown training area. Once away from the base complex, it was dark—very dark. Up and away, we slowed down, opened the sliding door, positioned the searchlight and started out with line searches and turns around a spot on the ground. I was learning how to cross-check between flying the light and flying the instruments and was having no difficulty. It was fun, and the light appeared to be pretty effective. Communication between student pilot and experienced engineer was going well, and I was comfortable with the way things were developing.

We came back a bit closer to the base area and set up for the next situation, which was to hover while the light was placed and kept on a spot. The target was selected from the dim glow of the reflected lights from the base, and we positioned ourselves for the maximum training benefit. In this case, maximum training benefit would have the helicopter pointing into the black nothing that was over the range area: no lights, no horizon, nothing.

I remember being aware that transitioning to the hover in this condition would put us downwind, but we were light in weight and had plenty of power in hand, so this shouldn't have been a problem. I started the transition gingerly and there were a few vibrations, but that was normal for a downwind approach. The light was shining on the house, and I was taking my time—there was not much to look at straight ahead, and I was aware one could get sucked in by just looking at the house. The instructor, who was watching the target, seemed to think that the transition was taking a bit too long, and he said “Raise the nose just a bit more and lower the collective just a bit.” Being a dutiful student, I did as requested, not by looking at the target (which was off to one side by now), but by glancing quickly at the attitude indicator.

I don't recall any indications of impending doom—there were vibrations, but nothing unusual. The target seemed to be in about the right place and power seemed to be OK, when suddenly the

engineer yelled “pull UP, **pull UP, PULL UP!**”

The next few seconds got pretty confusing.

The instructor immediately yanked on the collective and then took control, in that order. We started to climb, or at least it felt like a climb to me. I do remember the low rotor warning coming on and going quiet at least a couple of times. The torque was quite high (about 110%) and we were going up like an elevator. At least the engineer stopped yelling, and, as we were within spitting distance of the heliport, we entered a tight circuit and landed. I don't remember if we declared an emergency or not, but within a few moments we were on the ground and walking into the maintenance office.

“Only 110% torque?” the maintenance people said. “Hmm, tricky.” After a lot of digging through maintenance manuals and several cups of coffee, it was decided that only a visual inspection was needed if the torque was less than 113%. I'd just had my first encounter with the torque limiter on the Bell 212.

For those who are interested in what really happened—all I can surmise is that since we were downwind and got into a bit of descent, we entered vortex ring state without knowing it. Only the quick response of the engineer saved us. We didn't recognize it because we had no visual references and no experience of what the symptoms of vortex ring state might be. 🚁

## Occurrence Synopses

The following information may change as investigations progress.

**31 May 2000**                      **Smithers, B.C.**                      **MD 500D**                      **C-GBCW**  
*TSB Report A00P0091*

Two miles short of destination, as the helicopter was in final descent for landing, the engine flamed out.

The pilot attempted an autorotation to a field near Smithers, but the ensuing hard landing caused considerable damage. The tail boom was broken off, and there was heavy damage to the main rotor and undercarriage. Both occupants suffered minor injuries. The 500 was on a ferry trip from Williams Lake, B.C., to Smithers, B.C., and 1hr. and 50 min into the flight, the pilot noticed that the fuel gauge showed 115 lb remaining. The crew decided to continue on to destination and flamed out on final. At no time did the low fuel warning light (which is set to illuminate at 35 lb remaining and is not independent of the fuel gauge) illuminate during flight or approach. However, the light did illuminate (the float was jarred loose) after ground impact.

*Pushing two hours of flight time in an MD 500 is pushing your luck and, in this accident, the luck ran out, along with the fuel. If in doubt, fly on time and err on the high side. Always leave something in the tank for mom and the kids. —Ed.*

**01 June 2000**                      **North Helmet, B.C.**                      **Bell 206B**                      **C-GIFR**  
*TSB Report A00W0105*      60 mi. NE of Fort Nelson, B.C.

The helicopter was on final approach for landing at this northern B.C. airport when it crashed, killing the pilot, who was the lone occupant.

Observers stated that during approach the nose yawed to the right, dropped into a severe nose-low attitude and the helicopter crashed, burning on impact.

**01 June 2000**                      **Fort Chipewyan, Alta.** **AS350 BA**                      **C-GRTM**  
*Cadors No.: 2000C0473*

While the helicopter was in a five-foot hover during forest firefighter training when one of the trainees slipped off the skid and fell to the ground, landing on and injuring her back.

**01 June 2000**                      **Peace River, Alta.**                      **Bell 206B**                      **C-FPQS**  
*CADORs No.: 2000C0503*

Numerous aircraft and the Search and Rescue Satellite Aided Tracking (SARSAT) system reported an emergency locator transmitter (ELT) signal in the Slave Lake region of northern Alberta. A Hercules (Lockheed C-130) from Winnipeg and a Griffon (Bell 412) from CFB Cold Lake were dispatched to find the ELT. The signal was tracked to a Bell 206 parked on a pad at an oil exploration site. The 206 pilot had no idea that the ELT was transmitting.

*It's a good idea to check on 121.5 MHz after landing, just in case, and if you hear a very loud and clear ELT signal, guess whose it probably is? If you're going to be on the ground for a while, say over night, why not turn the ELT OFF, that way you definitely will not get the cavalry looking for you as you sleep. But please remember to place the switch to the ARMED position prior to your next flight. Include "ELT ARMED" in your "before-first-flight-of-the-day" check. Don't fly with the ELT switched OFF, as too many have done in the past. —Ed.*

**03 June 2000**                      **Steen River, Alta.**                      **Bell 206B**                      **C-GLVJ**  
*TSB Report A00W0112*      16 mi. NE

The main rotor struck a tree while the pilot was manoeuvring for landing in a confined area during firefighting operations. The attempted landing was aborted and a successful landing was carried out in a nearby—considerably larger—area. Examination after shutdown revealed damage to one main rotor blade, which was replaced on-site before the helicopter could be returned to service.

**03 June 2000**                      **Eugene, Oregon**                      **Bell 212**                      **C-FHDY**  
*TSB Report A00F0035*

The pilot turned base, lowered the collective a little and started to reduce the throttles in preparation for yet another power recovery autorotation when a loud bang was heard followed immediately by a severe vibration. He lowered the collective, rolled off both throttles, set the air speed at 80 kt and instructed the co-pilot to call a Mayday. The pilot conducted a successful autorotation, shut down the engines by pulling both T-handles and turned off the battery. The vibration and a noise from the back of the helicopter, continued throughout the landing and shutdown. A post-shutdown inspection revealed that the entire tail rotor assembly, including the 90° gear box, had separated from the tail boom. Inspection of the tail rotor blades revealed that the tip weight on one of the blades was missing.

**12 June 2000**                      **McBride, B.C.**                      **AS350 B**                      **C-GPWP**  
*TSB Report A00P0102*      25 mi. SW

The helicopter was returning for another long line sling load and, as it passed through 200 ft AGL, the engine failed. The aircraft was heavily damaged during the ensuing landing. The pilot was not injured. Initial examination revealed no anomalies that could have caused the failure. A complete engine teardown is being conducted with the assistance of the Transportation Safety Board.

**20 June 2000**                      **Hamburg, Alta.**                      **R 44**                      **C-FXAW**  
*TSB Report A00W0124*

The main rotor struck trees during descent into a small clearing beside a well site. A hard landing followed, which resulted in the tail rotor contacting the ground. The 44 was heavily damaged, but the pilot escaped uninjured.

**22 June 2000**                      **Llewellyn Glacier, B.C.**      **Bell 206L-1**                      **C-FJAL**  
*TSB Report A00P0107*

The main blades struck the ice, causing the 206 to crash on the Llewellyn Glacier near Atlin, B.C., during the filming of a movie, killing the pilot and three passengers. The wreckage broke up, caught fire and tumbled down the glacier, coming to rest 70 ft down a crevasse. The Transportation Safety Board is investigating.

**17 July 2000**                      **Wabasca, Alta.**                      **Bell 206B**                      **C-FPQS**  
*TSB Report A00W0147*      25 mi. NE

The 206 was seeding along a hydro line when the seeding apparatus became entangled in the wires. Control was lost and the helicopter crashed in a nearby bog. The helicopter was badly damaged, but the pilot and his passenger escaped with only minor injuries. The accident took place at about 20:30 Mountain Daylight Time, and the helicopter was travelling west, so the sun was directly in the pilot's eyes. The crew called for help on a cell phone.  
*A cellular or satellite phone is a handy piece of survival equipment. —Ed.*



**04 Aug. 2000**                      **Hare Field, Ontario**      **Enstrom 480**                      **C- GYRP**

*TSB Report A00O0168*

The Enstrom was about five feet off the ground when the pilot heard a loud bang coming from the area of the transmission. He landed without problem, and initial examination discovered many metal particles on the transmission chip detector. Teardown of the transmission revealed several missing teeth on the planetary gear. The transmission chip detector light had illuminated on a trip the previous day and, when the chip plug was inspected on the morning of the occurrence, it was found to be covered in a sludgy deposit. The oil had been changed, and a ground run completed without problem. On the next trip the transmission problem took place.

**10 Aug. 2000**                      **Ekati, N.W.T.**                      **AS 350B**                      **C-FSHV**

*TSB Report A00W0175*      10 mi. NW

The helicopter began to spin uncontrollably as it was returning for another sling load of drill equipment. Control could not be regained, so the pilot attempted an emergency landing into an area of large boulders. The helicopter ended up on its side, badly damaged. The pilot was not injured.

**13 Aug. 2000**                      **Cold Springs, Nevada**      **Bell 412**                      **N174EH**

*TSB Report A00F0053*

The pilot of a second helicopter flying about one mile behind the accident 412 watched as it suddenly made a 90° left descending turn and crashed, killing the pilot. There were no radio communications with the accident pilot immediately before the accident. The accident helicopter was the lead in a flight of two helicopters that were to make bambi bucket water drops along a ridgeline during firefighting operations. The two helicopters travelled in a northeasterly direction to the ridgeline, and the lead had turned to parallel the ridgeline when it suddenly turned left and crashed. The pilot of the second helicopter estimated the airspeed as they approached the ridgeline at about 20 kt.

Temperature at the time of the accident was 79° Fahrenheit, and the winds were out of the NNW at 10 to 15 kt. The crash site was 6300 ft ASL and the density altitude calculated was 9100 ft.

No filament stretch was found on any of the caution/warning lights (this would indicate that the light was probably on at time of impact if the filament was stretched).

This accident is being investigated by the National Transportation Safety Board (NTSB), and for further information see NTSB file **DEN00FA084** at

« [http://www.asy.faa.gov/asp/asy\\_antsb.asp](http://www.asy.faa.gov/asp/asy_antsb.asp) ».

**18 Aug. 2000**                      **New Hazelton, B.C.**                      **Bell 206B**                      **C-FAHV**

*TSB Report A00P0158*

55 mi. NW

The helicopter, in cruise flight at 65 kt with a sling load, was in the mountains at 5500 ft when the engine failed. The pilot dropped the load and autorotated to an alpine meadow. The hard landing resulted in minor injuries to the pilot and major damage to the helicopter. The pilot stated that a few seconds before the failure, the engine had decelerated to about 98%.

**19 Aug. 2000**                      **Emo, Ontario**                      **Baby Belle**                      **N247BB**

*TSB Report A00C0194*      20 mi. west of Fort Frances

The Canadian Baby Belle distributor positioned the amateur-built helicopter in a local baseball diamond. Just after lift-off, on a demonstration flight with the pilot and one passenger on board, the helicopter crashed, injuring both occupants and badly damaging the machine. During the attempted departure, the helicopter managed to clear the ball diamond fence but lost rotor RPM during the attempted climb.

Confronted with trees and a built-up area directly in his path the pilot attempted to turn and land on a road.