

*Learn from the mistakes of others; you'll not live long enough to make them all yourself . . . Issue 4/2004*

## VFR Flight Into Adverse Weather— Collision With Terrain

On June 6, 2002, a Cessna 182P was on an afternoon flight from Abbotsford, B.C., to Calgary, Alta. It failed to arrive at its destination. Emergency locator transmitter (ELT) signals were detected and the wreckage was located 17 NM northeast of Hope, B.C., at an elevation of 4 048 ft above sea level (ASL). The aircraft was destroyed. The four persons on board were fatally injured. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A02P0109.

Before departure, the pilot received a pre-flight weather briefing in person from the Abbotsford flight service station (FSS) specialist, who advised that the weather appeared to be suitable for flight in accordance with visual flight rules (VFR). It was suggested that the pilot contact Abbotsford FSS, in the vicinity of Hope for a weather update, since the weather in the vicinity of Hope is known to be subject to rapid changes. No such call was received from the aircraft. The pilot filed a VFR flight plan to Springbank airport in Calgary via Revelstoke, B.C., and indicated he would proceed direct to Revelstoke. The aircraft departed Abbotsford at 14:05 Pacific daylight time (PDT) and was observed on radar flying directly to Hope at an altitude of 5 000 ft ASL and a ground speed of 150 kt. At Hope, at approximately 14:30, the radar returns ceased because of the mountainous terrain.

The aircraft was equipped for instrument flight, including a transponder, dual VORs, DME, ADF, and a GPS. It was not equipped with any anti-icing or de-icing equipment. It could not be determined if the pilot considered the aircraft weight and balance; no calculations were found. Prior to arriving in Abbotsford, the aircraft had left Boeing Field in Seattle, Washington, and the TSB determined that the aircraft's weight on departure from Boeing Field was 164 lbs above the maximum allowable take-off



weight of 2 950 lbs. The aircraft was not refuelled in Abbotsford. Its weight at the time of the accident was calculated to be within limits, at 2 949 lbs.

The wreckage was found on a heavily wooded, west-facing 45° slope. This site is about 1 NM south of the direct track from Abbotsford to Revelstoke. Tree damage and contact markings showed that the aircraft's flight path was mainly vertical at the time of impact. The wreckage was examined for pre-impact defects and none were found.

The pilot had 3 370 flying hours on light, single-engine aircraft, including the Cessna 182P, and was qualified to operate the aircraft under IFR. There were no medical condition that could have led or contributed to the accident.

The graphical area forecast (GFA) for the area between Abbotsford and Calgary for 11:00 (3 h 37 min before the accident) and that for 17:00 (2 h 23 min after the accident) are almost identical. They called for broken clouds based at 6 000 ft ASL topped at 16 000 ft ASL; scattered towering cumulus clouds topped at 20 000 ft ASL; prevailing visibility

more than 6 SM in light rain showers; isolated cumulonimbus clouds topped at 25 000 ft developing after 13:00; and the prevailing visibility more than 6 SM in light thunderstorms with hail along the mountains. The freezing level was forecast to be around 6 200 ft ASL.

Additional weather data was obtained from three British Columbia Ministry of Transportation (BC MOT) weather observation stations, all located within a few miles of the accident site. These stations record data for the BC MOT snow avalanche and weather system. This data showed that, at the time of the accident, the winds were from the southwest at 24 kt, the temperature was close to the freezing mark, and some precipitation in the form of snow occurred.

A surveillance video, taken at the Coquihalla highway toll booth, approximately 5 NM northwest of the accident site, showed low cloud, rain, and gusty winds at that location around the time of the accident.

*Analysis*—Information from the three BC MOT avalanche weather stations and reference to the Coquihalla toll booth surveillance video indicate weather conditions at the time and place of the accident were probably much worse than forecast. The ceiling was probably lower than the forecast 6 000 ft ASL and the freezing level very close to the surface, around 4 000 ft ASL. In the area of the accident site, the pilot would have encountered rising terrain. He would also probably have encountered a lowering ceiling, likely forcing him to descend below his cruising altitude of 5 000 ft ASL in order to maintain VFR flight. Near the base of the cloud, he may have encountered turbulence, snow, and airframe icing. But he would have had very little room to descend, as the terrain in that area is relatively high, with no less than five mountain peaks ranging in elevation from 6 009 to 7 088 ft ASL, located within a 10 NM radius of the accident site.

While the pilot held a valid instrument rating and had considerable experience in instrument flight, he was not in contact with air traffic control (ATC) and had no IFR clearance. To contact ATC, he would have had to climb several thousand feet because of the high terrain. A climb through cloud from his location would have been risky because of

the low performance of the aircraft at its high weight and high elevation, and the close proximity of numerous mountain peaks. Had the pilot abandoned visual flight, made a transition to instrument flight, and attempted to climb to a safe altitude, he would likely have encountered icing and possibly thunderstorms. It is likely that he elected to manoeuvre his way around visually, taking the risk of encountering instrument meteorological conditions (IMC).

The aircraft's flight path was mainly vertical at the time of impact, indicating the aircraft was not under control. The severity of the damage and the angle at which the aircraft contacted the terrain indicates the aircraft was likely in a spiral dive at impact, not in a stalled condition. As indicated by the last GPS-recorded aircraft position and the accident position, the aircraft was travelling southward prior to impact. The fact that the fuselage was pointing 330° may be indicative of the aircraft being in a spiral dive. The most likely scenario to account for this accident involves a known phenomenon encountered by pilots flying in mountainous terrain. The high ground obscures the natural horizon and, in this occurrence, the difficulty in seeing the horizon would be exacerbated by the low cloud.

When he encountered rising terrain and lowering cloud, the pilot probably lowered the aircraft's nose to avoid entering cloud and started a turn to reverse his course. Because no horizon would be visible when looking outside the aircraft, the only way to maintain control during this turn would be by reference to flight instruments. For unknown reasons, the pilot lost control of the aircraft, and because of the relative proximity of the terrain, the aircraft struck a tree before the pilot was able to recover control.

*This accident should serve as a good reminder to all that weather in mountainous terrain can vary significantly from forecast. Although the pilot does not appear to have updated his weather en route, he did attend a weather briefing in person before departure and was advised that the weather appeared to be suitable for flight in accordance with VFR. Keep this in mind next time you fly near or over mountains. Keep your options open, particularly in being able to remain VFR at all times. The full report is available on the TSB Web site. —Ed. △*

## **Call for Nominations for the 2005 TC Aviation Safety Award**

*Do you know someone who deserves to be recognized?*

The Transport Canada Aviation Safety Award is presented annually to stimulate awareness of aviation safety in Canada by recognizing persons, groups, companies, organizations, agencies, or departments that have contributed in an exceptional manner to this objective.

You can obtain an information brochure explaining award details from your Regional System Safety Offices, or by visiting the following Web site:  
[www.tc.gc.ca/CivilAviation/SystemSafety/brochures/tp8816/menu.htm](http://www.tc.gc.ca/CivilAviation/SystemSafety/brochures/tp8816/menu.htm).

The closing date for nominations for the 2005 award is December 31, 2004. The award will be presented during the 17th annual Canadian Aviation Safety Seminar, which will be held at the Fairmont Vancouver Hotel in Vancouver, B.C., April 18 to 20, 2005. △



The Aviation Safety Letter is published quarterly by Civil Aviation, Transport Canada, and is distributed to all Canadian licensed 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 ASL reserves the right to edit all published articles. Name and address will be withheld from publication at the writer's request.

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Flying Through Washington, D.C.? You Better Read This First...

by Nora Vallée, Civil Aviation Safety Inspector, Regulatory Services, Transport Canada

The Aviation Enforcement Division has conducted several investigations of airspace incursions by Canadian pilots in the highly protected Washington, D.C., air defense identification zone (ADIZ). The Federal Aviation Administration (FAA) designated this ADIZ as requiring special security instructions and emergency air traffic rules. The Washington, D.C., ADIZ, as described in NOTAM 3/2126, is an area where the ready identification, location and control of aircraft are required in the interest of national security. The outcome of an unauthorized flight into the Washington, D.C., ADIZ could be very serious. The offender could be intercepted with harsh consequences because of the particularly sensitive environment. In all cases, pilots might be subject to enforcement actions either by Transport Canada or the FAA.

Today's extremely challenging flying environment requires a thorough knowledge of the aviation regulations and NOTAMs. It is essential for pilots planning to fly in the vicinity of the Washington, D.C., ADIZ to be aware of the applicable mandatory procedures. NOTAM 3/2126 required, in part, that civil aircraft operating in the ADIZ file and activate a flight plan, obtain a discrete transponder code from air traffic control (ATC), continuously transmit the discrete code, and establish two-way radio communications with the appropriate ATC facility before entering the ADIZ airspace. It is also very important to plot the ADIZ airspace on your map before flying in this area, as the ADIZ is not shown on the map. According to pilots' comments received during the investigations, it might be difficult to assess where you enter the zone, especially if you fly VFR. Furthermore, as there are many airports within the ADIZ, it is important to be familiar with the different procedures established at each location.

The American Owners and Pilots Association (AOPA) has put together an excellent online presentation, which explains the procedure for flying into or around the Washington, D.C., ADIZ. Check out www.aopa.org/adiz/adiz.html! The AOPA presentation also includes a list of additional references, including a link to NOTAM 3/2126, discussed above.

Remember that it is the pilot's responsibility to get all the pertinent information and to understand the procedure when flying into the Washington, D.C., ADIZ. Hopefully this information will greatly assist Canadian pilots who plan to fly near or through Washington, D.C. △

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## A Systems Approach to Managing Risk

The history of aviation has been one of continuous change. In 2003, Canada joined the world in marking the 100<sup>th</sup> anniversary of powered flight—recalling the December 17, 1903, flight of two brothers and bicycle makers from Dayton, Ohio. A little over five years later, at Baddeck, Nova Scotia, engineer J.A.D. McCurdy started the story of Canadian flight in the Silver Dart, creating a magnificent heritage for aviation. Those pioneers were also risk takers; however, they had no idea how to manage the risks in this new environment. As we head into the second century of flight, our business has become more focused on managing risks effectively to improve both safety and economic performance in aviation.

A systems approach to managing risk will be the cornerstone of our strategic plan to 2010—a natural evolution, but revolutionary in its approach. At the forefront of this approach—which is more about integrating the processes that already exist in most aviation organizations, and less about creating new ones—are processes that establish clear lines of accountability. The future we are building towards is one where industry operates at the maximum level of delegation possible, with the flexibility to meet safety requirements in the most cost-efficient manner. This means that the regulatory framework must be increasingly performance-based to permit the implementation of systematic approaches to provide continuous improvement in safety performance.

Implementing this new safety policy for the future of aviation safety in Canada is our first priority. However, implementing a new policy carries its own share of risks when the old policy has resulted

in an excellent safety record. The accident rate continues on the downward trend that it has been on for the past few years, and the preliminary results of the latest public survey indicate that confidence in flight safety is on the mend, with a 67 percent rating, up from the 2002 rating of 60 percent. So why change?

First, studies of future demographics indicate that the current safety framework is not sustainable due to a lack of technical personnel in the industry in the future. This will translate into a shortage of qualified personnel to oversee the current system from the regulatory perspective. Second, the accident rate has all but stagnated in the last ten years. This current accident rate, applied to a growing industry, will—by some estimations—result in an unacceptable number of accidents, which will in turn reduce public confidence in the system.

While Civil Aviation's safety focus has not changed and the program is staying the course, the world has changed and, as such, the organization must adapt. Civil Aviation must be equipped to reach its goals in this changing environment. We will continue to need to hire experienced industry people and train them to be inspectors, but we will also need "systems" people. For civil aviation in Canada, the greatest challenge lies in making the necessary cultural changes. However, like those pioneering risk takers from the last century of flight, I believe that we are up to the challenges as we move forward into the future of aviation safety. △

Merlin Preuss  
Director General  
Civil Aviation, Transport Canada

### 2004–2005 Ground Icing Operations Update

In mid-July 2004, the Winter 2004–2005 *Holdover Time (HOT) Guidelines* were published by Transport Canada. Check out the following Web site for all the details:  
[www.tc.gc.ca/CivilAviation/Commerce/HoldoverTime/menu.htm](http://www.tc.gc.ca/CivilAviation/Commerce/HoldoverTime/menu.htm)

A summary of this year's changes to the *HOT Guidelines* follows:

In the Type II and IV fluid tables, only a limited amount of data had ever been collected in temperatures below -14°C in snow conditions. During the winter of 2003–2004, testing was conducted with artificial snow makers at temperatures below -14°C using qualified Type II and Type IV fluids. This testing has led to a reduction in the -14°C to -25°C snow cells for the following fluids: SPCA Ecowing 26, Clariant Safewing IV 1957, Clariant Safewing IV 2001, Kilfrost ABC-s, Octagon Max-Flight and SPCA AD-480.

In addition, the fluid-specific table for the Clariant Type IV Safewing Four fluid has been removed since it is no longer commercialized.

Several years ago, a need was identified for a de/anti-icing fluid that had longer holdover times than a Type I fluid, but a lower viscosity than a Type II or IV fluid, for use on aircraft with lower rotation speeds. Clariant produced the Safewing MP III 2031 ECO fluid, which met all the applicable requirements and is now qualified as a Type III fluid. Therefore, a new Type III generic fluid table was produced this year based on the holdover times of this fluid.

There were no changes to the Type I fluid.

If you are interested in understanding or learning more about fluid testing and qualification, refer to the following documents from the Society of Automotive Engineers (SAE): AMS 1424 and AMS 1428. These and other documents are available for purchase from the SAE at the following Web site:  
[www.sae.org](http://www.sae.org).

There were no changes made to TP 14052, *Ground Icing Operations Update*; the reference document that should be used in conjunction with the *HOT Guidelines*.

If you have any questions or comments regarding the above, please contact Doug Ingold at [INGOLDD@tc.gc.ca](mailto:INGOLDD@tc.gc.ca). △

## Beware of the Conditioned Response

by Garth Wallace

A customer rented a Piper Cherokee 140 at the school where I taught flying, and taxied it under the wing of a McDonnell Douglas DC-9. It didn't fit. The trailing edge of the DC-9's aileron neatly sliced through the top of the 140's rudder. The pilot must have felt a jerk, accompanied by the sound of ripping fibreglass, but he didn't stop. He continued to the runway, took off, flew back to our base and parked the Cherokee on the flight school ramp. He paid for the flight without mentioning the damage.

A flight instructor and student had the next booking on the aircraft. The instructor rubbed his

was spent on an intense walkaround lecture.

Later, the instructor led the discussion at the staff coffee break.

"I couldn't believe that my student inspected the airplane without seeing the wrecked rudder." He groaned and shook his head.

"It doesn't surprise me," our chief flight instructor (CFI) replied. "I bet most students would miss it. They become conditioned. We show them what to inspect, but everything looks good. When they find something, like a low oil level, we tell them it's OK for another hour. Then the pre-flight decision making is

took the pre-flight seriously. He inspected the airplane from top to bottom, bustling in, around and under, checking everything thoroughly. At the rudder, he looked up, stopped and stared. He glanced toward me. I pretended to be interested in something else. He stood there contemplating the dangling wires for another moment and then continued inspecting the airplane. When he was done, he looked at the tail again, turned to me and said, "Ready to go?"

I couldn't believe it. My most experienced student wanted to climb into a broken airplane and fly. I had lost the bet, but I



eyes and looked again when he saw the top of the rudder. Wires for the missing rotating beacon and rear navigation light hung over the jagged edge.

His student completed the pre-flight inspection and said, "All set?"

The instructor glared at him. "Didn't you find anything wrong with the airplane?"

"No, it looks fine. Are we ready to go?"

"No."

Several things happened over the next hour. The damage was reported to the flight school's chief mechanic. The receptionist juggled the bookings so that the instructor could have another aircraft. The rest of that lesson

back to the instructor."

"I'll take you up on your bet," I offered. "Leave the Cherokee on the ramp and I'll send my next student to inspect it. I bet he snags the damage."

"Who's the student?" the CFI asked.

"Melville."

Melville Passmore was my highest time student. He was a farm-smart country boy who was struggling with the academics of learning to fly, but was quick to grasp the practical. He was the most likely student to spot the damage.

Melville and I walked across the ramp to the waiting Cherokee. The CFI watched from inside. The little farmer always

wanted to test him further. "Are you ready to go?" I asked.

"Ready when you are," he replied promptly.

"What about the top of the rudder?"

Melville looked at it and said, "It's gone."

"No kidding. Didn't I teach you to check for damage on a walkaround?" I barked.

Melville stuffed his hands into his coverall pockets and hung his head. He looked at the ground and said nothing.

"Didn't I?" I demanded.

"Yes," he replied weakly. He didn't look up.

I was about to continue my inquisition when the CFI came out of the office.

"I can guess what's going on," he called out as he crossed the short distance to the airplane. "Tell me, Melville, did you notice the damage on the tail during your inspection?"

Melville replied quietly, "Yes."

"Why didn't you mention it?"

"I don't know," he answered meekly.

"Have you mentioned snags on walkarounds before?"

Melville lifted his head slightly. He looked at me and then at the CFI. "Yes."

"What happened when you did?"

I could tell that he didn't want to answer. He watched his feet and didn't respond.

"This is not a test, Melville," the CFI said, "and nobody is going to yell at you."

"When I asked about a balding tire," Melville replied slowly, "I was told that it would last until the next inspection. I mentioned a crack in the windshield once and was told, 'it's too small to worry about.' One time the fire extinguisher pressure was a bit low. 'It will still work.' was the reply."

I could hear myself saying these things to Melville. The CFI's point was sinking in. I had conditioned Melville to ignore discrepancies.

"Would you fly this airplane solo today?" the CFI asked.

"No," Melville answered quickly.

"Would you fly it with an instructor?"

Melville shuffled his feet a little. "If he said it was okay."

"Well, it's not okay, Melville," he replied. "This other Cherokee is available. You guys can use it for your flight today." He turned and started to walk away.

"The wing is bent on that one," Melville announced softly.

The CFI stopped in his tracks and turned around. "What did you say?"

Melville stared at the ground and mumbled, "The left wing is bent up more than the right one."

The CFI walked over to the next airplane and looked at it from the front. Melville and I followed. The Cherokee was definitely sitting at a slight angle.

"I think the one oleo is lower than the other, Melville," the CFI said.

The little round farmer walked up to the airplane, squatted on his haunches and pointed at the wing root underneath. "You can see where the skin has been pulled," he said.

The CFI crouched beside him and looked. "I don't see anything," he said.

"You have to look closely."

The CFI crawled under the wing and looked up. There were stretch lines in the wing panel under the main spar and little smiles of metal skin buckled against some of the rivet heads. The airplane must have been landed hard on that side.

"How long has it been like that?" the CFI asked.

"A couple of weeks," Melville answered.

"That explains why it spins differently left and right," I offered.

"I'll get the Chief out here," the CFI said. "You two find something else to do. We're out of airplanes." He headed toward the maintenance shop. The Chief was the school's head aircraft maintenance engineer (AME).

"Have you found anything wrong with other aircraft?" I asked Melville.

"Yes," he replied shyly.

"Like what?"

"The scissors on the right gear

leg of Alpha Bravo Charlie are cracked." He looked at me to see if he should keep going.

"And?"

"The tail skid on Delta Echo Foxtrot has been banged into the fuselage."

I nodded for more.

"The aileron chains on Golf Hotel India's control wheels are worn."

"How do you know?"

"I turned both control wheels in opposite directions from the pilot's seat, they moved about 20 degrees."

"Well, there is only one other Cherokee in the fleet."

"Its propeller is out of track."

"How did you find that out?"

"I could feel it vibrate the last time I flew it. When I was back on the ground, I checked the track against the engine nose bowl. It's out a few millimetres."

The Chief and the CFI appeared from the hangar. The mechanic crawled under the wing. "Yup, she's been pulled all right." He jumped to his feet. "Thanks, Melville. You're pretty sharp to spot that."

The young farmer beamed at the compliment.

"With these two damaged Cherokees, my shop is going to be busy for weeks," the Chief declared. He turned to the CFI, "Both these airplanes are grounded. You guys will have to make do with the rest of the fleet."

"You don't know the half of it," I replied.

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# Recreational Aviation

Serge Beauchamp, Section Editor (E-mail: [beauchs@tc.gc.ca](mailto:beauchs@tc.gc.ca))

## **The Sky is Ours to Share: Bird Strikes Can be Hazardous**


Close calls between aircraft and birds of all species occur on a regular basis. The number of reported collisions with birds during the last five years totals 1 975; a little more than one per day. Of course, it is likely that many more were not reported by the aircraft owner or pilot. It is usually deadly for the bird, and very dangerous for the safety of flight. Think of what a small pebble (1/2 oz. or 14 g) does to your car's tempered glass windshield when it collides with it at 100 km/hr, and you will realize that a small duck or a seagull can inflict damages that may immediately render your airplane unairworthy and endanger your life.

In 1983, an aircraft owner was flying at about 500 ft when he encountered a flock of Canada geese as he executed a turn to return home. The impact, directly on the propeller, tore the engine from its mount, and as it was bolted to the main spar, it failed. This small twin-engine ultralight aircraft fortunately had been equipped with an emergency parachute that successfully lowered both the pilot and the aircraft to the ground. The pilot later became the editor of the Canadian E-magazine, *Ultralight News*. More recently, on May 20, 2004, a Fairchild SA-227AC Metro was climbing through 9 500 ft after departure from La Ronge, Sask., when the aircraft struck two Canada geese. The aircraft sustained minor damage to its horizontal stabilizer, continued on to destination, and landed without incident. The incident could have spelled disaster if the birds would have hit the windshield, as the geese's weight far exceeds that of the bird used to establish the norm of windshield-impact resistance.

Bird numbers in Canada are astounding, and the danger that they represent to aircraft should not be ignored. Birds survive in areas that offer a safe shelter, good breeding and feeding grounds, and afford them a play area for raising their young. Waterfowl live along rivers and lakes; pelicans and gulls, for example, have a liking for cities, towns and villages situated near large waterways, lakes and seas, where they can forage for easy pickings along the shoreline, or feed on discarded leftovers from city-dwellers at the garbage dump. They enjoy the nearby peaceful airport areas where they will nest and rest, unprovoked by predators. Spring and fall migration do present specific hazardous conditions for pilots, and learning of the specific migratory routes before a flight will minimize the



risks at that specific time of the year. Birds can be encountered at any airspace level, even up to 20 000 ft.

An encounter with a flock of ducks or seagulls shortly after takeoff, at low altitude and during climb-out, can represent one of the worst scenarios for a pilot, as there is low forward speed, a high angle of attack, and a risk of engine failure or flight control failure at a time when pilot concentration is at its highest level and there is little margin for error. A bird strike is understood to be any contact between a moving aircraft and a bird. Subsection 6(1) of the *Transportation Safety Board Regulations* requires that a collision with an obstacle be reported as quickly as possible to authorities in order that the information be compiled, analyzed and that programs may be developed to assist in diminishing the risk that it represents to air safety. Statistics about collisions with birds in Canada tend to show that most bird strikes occur almost equally during the take-off and landing phases of flight; 39% and 41%, respectively. Birds of prey have been observed attacking aircraft, but most birds are alarmed by an incoming aircraft and will try to flee the scene to avoid collision. Flocks of geese have even been seen following low-flying ultralight aircraft during the migratory season, so one must always keep in mind the presence of these creatures during takeoff and approach to landing, whenever flying at low altitude and during the migratory periods of the year. Be alert, and remember, the sky is not ours alone. 

## Accident Reports

*The object of this column is to inform recreational aircraft owners and pilots about incidents and accidents that have occurred in Canada in recent months. This information is published in order that pilots may identify conduct that leads to risk, and too often, to a loss of life. No one sets out on a flight with the intention of endangering life, therefore one must guard against risks. How is this achieved? By being prepared. Prior to flight pilot-in-command must obtain all the information that may be pertinent to the safety of the flight. They must ensure that they are fit—their health, fatigue and emotional level must easily meet the requirements for good health—and adequately trained. Before a flight, they will review all emergency procedures that can unexpectedly surface during flight, and complete a pre-flight inspection of the aircraft to identify any deficiencies. Flying requires professionalism, competency, excellent health and a great deal of common sense. A safe flight is a planned affair. Be safe!*

**Quebec Region—April 2004:** The ultralight aircraft, a Cosmos II, was approaching to land at the airport when the engine suddenly stopped. The pilot directed his trike aircraft to a nearby bicycle path, but during the landing phase, the left wing hit trees and it incurred some damages. There were no injuries.

**Quebec Region—May 2004:** A Murphy Moose amateur-built aircraft sustained heavy damage following landing. It appears that during the roll-out, one of the aircraft brakes seized and the aircraft flipped over. Neither of the two passengers was injured.

**Quebec Region—June 2004:** The amateur-built Lair 01 floatplane was in cruise flight when the engine suddenly sputtered and stopped. The pilot tried in vain to reach a lake, but had to make do with a small clearing. The landing was carried out without injury to the pilot, the sole occupant, but the aircraft did sustain heavy damage. The engine failure may have been due to the poor quality of the fuel. The fuel came from jerrycans filled a year earlier, and water may have been present at the time of refuelling. The pilot is investigating the failure and will report any new information observed during the teardown of the engine to the Transportation Safety Board of Canada (TSB).

*Clean and abundant fuel is your lifeline to safety; always check the fuel, filters and fuel-tank drains for the presence of water before every flight. —Ed.*

**Quebec Region—June 2004:** The float-equipped C185 was leaving the dock where it had been tied-down. Its passenger was standing on one of the floats, hanging onto the strut, giving verbal directions to the pilot. There was another person on the dock, holding on to the wing tip and helping to

clear the floatplane by a small fishing boat. The passenger standing on the float reached down to help clear the floatplane away from the boat, and when the person stood-up, the turning propeller struck her. As soon as the pilot realized that he could not see his passenger anymore, he stopped the engine and investigated. But it was too late; the passenger succumbed to her injuries. The floats had been repainted the year before but the red warning line usually painted on the floats had not been replaced.

*It serves to warn anyone who ventures on the float to beware of the propeller. Although the passenger had nearly 200 hr of flying time as pilot-in-command of this C185, it seems that for a fatal instant, the windmilling propeller was forgotten. Every year, similar accidents are reported, and they are usually fatal. Before every flight, a pilot-in-command has the responsibility to brief all passengers, and flight assistants when applicable, of all information that will ensure safety on the ground, in the water and in the air. The safety briefing is required by the regulations, and is part of every pre-flight checklist. It only takes a few minutes to review, but can be instrumental in ensuring safety. Give the briefing. —Ed.*

**Quebec Region—June 2004:** The amateur-built float-equipped CADI was being flown at low altitude in preparation for a water landing. As it circled the neighbouring town at an ever-lower altitude, it collided with an electrical wire, and crashed in a nearby field. Fortunately, there were no injuries sustained by the pilot or his passenger.

*Electrical wires take their toll on low-flying aircraft each year. They are difficult to see because pilots do not look for them, nor do they look for the electrical poles that hold them 35 ft in the air. Normally, a prudent floatplane pilot will look for electrical wires, poles, as well as floating logs and debris, during the flight over the landing area before the approach phase to a landing. Somehow, many pilots seem to forget about this danger when they fly at low altitude over a friend's house, and collide with wires. It is often a deadly encounter. When leaving a safe altitude, always check for electrical wires and obstructions such as towers, antenna or communications towers, as well as floating debris in the water when performing a water landing. It should always be part of your checklist to check for possible obstructions in your landing path. Be alert. —Ed.*

**Quebec Region—June 2004:** The pilot of the Rans-Coyote ultralight aircraft was performing touch-and-gos when he lost control of the aircraft as the tail-wheel fell off. The pilot was able to land without further damage and the wheel was later found.

*Parts rarely fall off aircraft unless they have not received the care that is owed to them. A thorough pre-flight is a must and will not shorten your enjoyment of the flight. —Ed.*



**Quebec Region—June 2004:** The student pilot of a powered parachute was at an altitude of approximately 250 ft when he entered a spiral dive. He was unable to correct the manoeuvre and the wing attained a near 80° bank when he struck the ground. He sustained fatal injuries.

*Briefings offered by instructors are very important. They allow the instructor to assess the health, the knowledge and the readiness of the student to carry out the flight successfully. Pay attention during those briefings. —Ed.*

**Quebec Region—June 2004:** Two powered paraglider (PPG) student pilots were flying circuits at a local airport and performing touch-and-go landings. At the time, both students were receiving instructions from radio-equipped instructors who were on the ground. One of the two paragliders was flying faster than the other, and as he neared the landing area, he overtook the other aircraft and collided with it. The aircraft's propeller cut deeply into the fabric of the wing of the paraglider, it lost lift and started to descend from a height of 150 ft. Fortunately, the pilot was able to use all available power, and avert a very hard landing and possible injuries. Following the accident, the instructors reviewed the regulations pertaining to right of way, circuit procedures and emergencies with the students.

*Before setting out on a solo flight, student pilots should always review all procedures with their instructor to ensure a safe and rewarding outing. This should include a brief revision of emergency procedures. —Ed.*

**Quebec Region—July 2004:** The turbine-engine amateur-built aircraft was equipped with floats and was being taxied to test the aircraft's stability at various engine speeds and throttle settings. While taxiing at high speed, the aircraft took off and the pilot was unable to retard the throttle sufficiently to allow for a safe landing in the remaining portion of the lake, where boats of various sizes were cruising. He climbed out to a safe altitude, extended the flight sufficiently to confirm control of the aircraft, and proceeded on the approach to land. The pilot had not intended to fly the aircraft, and only filled the aircraft's fuel tanks with enough gas for the water test. As the pilot lined up for the final approach, the engine sputtered and quit. He was unable to make it to the lake and executed a forced landing in the woods. The aircraft was badly damaged but there were only minor injuries. Investigation revealed that there was no fuel left in the tanks after the accident.

*A pilot-in-command must plan for all emergencies. —Ed.*

**Ontario Region—May 2004:** The Volk Air Too float-equipped advanced ultralight was on a local flight with two people on board. Witnesses reported observing the ultralight take off in a westerly direction and then heard the engine backfiring.

The ultralight banked to the right and entered into a spiral dive. It did not recover from the spiral, and struck the water in a steep nose-down attitude. An emergency locator transmitter (ELT) signal was transmitted for a short period of time and the Trenton rescue coordination centre (RCC) responded. Both occupants were fatally injured.

*Control of the aircraft is a must. When an emergency occurs, the pilot should maintain control first; it is called aviate. Flying speed is crucial to allow for the control of the aircraft that can then be directed to a safe landing area. Ultralight aircraft do not require great surfaces to land safely and it is therefore crucial to remain in control until touch-down. Aviate, navigate, communicate—these are the three most important processes to control your flight, especially when confronted with an emergency. —Ed.*

**Ontario Region—May 2004:** A Cessna 172 was in cruise flight at approximately 2 500 ft when the pilot noticed a drop in oil pressure, followed by a loss of engine power. He communicated a distress signal with the air traffic control (ATC) service, and proceeded to land safely on a small county road. The landing was uneventful. Investigation by maintenance personnel revealed that an oil cooler line had failed, leading to the loss of the engine.

*Fuel and oil lines (rubber hoses) on airplanes have a life expectancy of approximately ten years, and although they may appear in good condition, when the inner part is subjected to chemicals and pressure, it will deteriorate over time. For safety, it is best to replace them when they near the ten years-in-service mark. —Ed.*

**Ontario Region—July 2004:** A Chinook ultralight aircraft was performing circuits at the Kakabeka Falls airport. Following a touch-and-go landing, the aircraft was observed turning left during the climb and crashing in a nearby field. The accident was fatal to the two occupants. It is unknown at this time what led to the loss of control.

**Pacific Region—July 2004:** The Quicksilver MX ultralight took off from Runway 22 at Courtenay (Smit Field), B.C., and flew on a runway heading for about two miles before crashing in a logged-off area of a mountain. The engine, a Rotax 377, was heard to slow before the aircraft crashed. The pilot was not injured, but the aircraft was substantially damaged. The pilot reported that after takeoff, the engine coughed, he pulled the throttle back and the engine smoothed out, but when he pushed the throttle back in, the engine quit.


*The failure may have been caused by a fuel availability problem? —Ed.*

**Pacific Region—July 2004:** The Quad City Challenger II/A ultralight was on a local flight in the Cranbrook, B.C., area. While on final for Runway 16, the engine (Rotax 503) abruptly lost power and the propeller stopped. The pilot advised

the flight service station (FSS) that he was making a forced landing, and landed in a field short of the runway. There was no damage, and the pilot, the sole occupant, was not injured. A loose connection was found in the ignition harness.

*Would a good pre-flight inspection have revealed the deficiency and prevented the forced landing? That is the question! —Ed.*

**Pacific Region—July 2004:** The Fisher Flying Products, Super Koala ultralight aircraft took off

westbound from the Glen Valley, B.C., ultralight airfield. When the aircraft reached about 200 ft AGL, the engine (Rotax 532) stopped. The pilot made a right turn and conducted a forced landing in a field adjacent to the airfield. The aircraft overturned during the roll-out due to drag from long grass. The pilot was not injured, but the aircraft was substantially damaged. The pilot reports that vapour lock may have caused the engine stoppage. 

## All Attitude Awareness and Recovery Procedures

by Paul Molnar, Certified Flight Instructor (CFI), FCI Flight Training, Niagara-on-the-Lake, Ont.

The overhaul article on the Lazair accident (*Recreational Aviation* 2/2004) was excellent, but I would like to add a couple of major points that were not mentioned.

First of all, stall recovery at all altitudes must also account for rolling the aircraft's wings level in an appropriate manner—coordinated aileron and rudder, and then pulling out of the dive. The lack of knowledge for this portion of a stall recovery procedure is what hurts many people as well. It's one thing to recognize the need to reduce AOA [angle of attack] and add power, but if the ensuing pull is not done with wings level/nose straight (no yaw) and with appropriate energy on the aircraft, a secondary/accelerated stall and/or structural failure could occur (due to the rolling "G" loading at a reduced altitude), with reduced potential for a successful recovery. Energy management can alleviate most attempts to pull over-aggressively from a dive, although the concurrent roll/pull (Rolling "G") combination can be deadly due to the increased torsional loads and possible structural failure created by improper and uncoordinated use of the flight controls.


[Secondly,] the final turn stall scenario (with or without power) is a very survivable situation, with an appropriate analysis of the situation and a timely response using an "acronym-based" recovery procedure, engrained in a pilot's mind so that under stress, they react with instinct instead of with panic. Of course, recognition and avoidance of this approaching situation would ultimately be preferred, but that does not exclude the need to have a game plan available if the situation occurs, pilot-initiated or not.

The recovery technique, "pressure, power, rudder, level, climb," is the recovery procedure for all stalls and incipient spins, which will ensure that the pilot has an improved method of recovery from the stall-spin attitude. This standardized recovery technique is verbalized while being utilized, which is paramount in ensuring that the aircrew under the stress of an emergency situation will execute a safe, timely and accurate recovery.

Nose-low, unusual attitudes must also be accounted for (not all final turn situations begin as

a stall), including aspects of energy management, aircraft movements and dive recovery. These situations may not be adequately addressed in some Canadian pilot training programs.

There is definitely a liability issue involved in acting as pilot-in-command of an aircraft, and one should be concerned with the responsibility of being adequately qualified for all aspects of flight that might be experienced under foreseen and unforeseen circumstances. Training for these conditions of flight is undoubtedly the best insurance for safety. One would also think that not only would a pilot be rewarded by a personal sense of well-being and control, but that an insurance underwriter may reduce the pilot's policy premium, as the risk of an accident is equally diminished. It is done regularly for twin-engine aircraft owners who attend annual training sessions at approved flight training organizations, such as Flight Safety International, and who fly a certain number of hours every year.

The use of generic techniques and a tactical approach to every aircraft attitude that the pilot may encounter will assist him in responding quicker and more efficiently to these unusual situations. Realistic training, energy management and the use of acronym-based, step-by-step recovery techniques are the key to safe flight, in my view. 

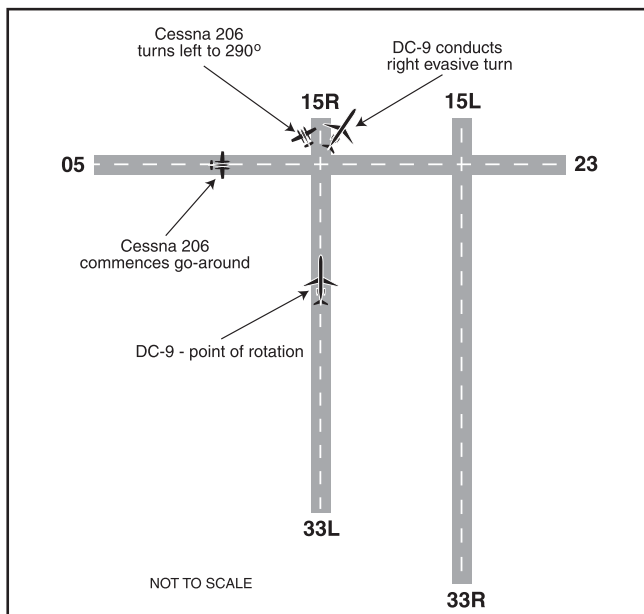


## Recently Released TSB Reports

The following summaries are extracted from Final Reports issued by the Transportation Safety Board of Canada (TSB). They have been de-identified and include only the TSB's synopsis and selected findings. For more information, contact the TSB or visit their Web site at [www.tsb.gc.ca](http://www.tsb.gc.ca). —Ed.

### TSB Final Report A02A0272—Risk of Collision

On August 25, 2002, at 09:36 Eastern daylight time (EDT), a Cessna TU206G amphibious float-equipped aircraft was approximately 3NM west of Lester B. Pearson International Airport (LBPIA), in Toronto, Ont., on approach to Runway 05, and was cleared to land and hold short of Runway 33L. About one minute later, a McDonnell Douglas DC-9 was authorized to taxi to position on Runway 33L for departure. Shortly thereafter, the airport controller advised the DC-9 that a Cessna 206 would land and hold short of Runway 33L, and then issued the take-off clearance.



After the Cessna 206 touched down on Runway 05, the controller issued taxi instructions to the pilot, with instructions to hold short of Runway 33L. The Cessna pilot then informed the controller that he was going around because of a landing gear problem. The controller immediately instructed the Cessna pilot to commence a hard left turn. At the same time the DC-9 flight crew, just after becoming airborne, observed the Cessna and initiated a right turn. The spacing between the aircraft was approximately 100 ft lateral and 100 ft vertical over the threshold of Runway 15R, with the DC-9 being higher. There were no injuries as a result of this incident.

#### Findings as to causes and contributing factors

1. Because of the backlog of departing traffic and in an effort to expedite departures, the controller chose to use land and hold short operations (LAHSO) instead of sequential runway operations, which ultimately resulted in a near collision.

2. The controller used LAHSO procedures between a departing and arriving aircraft on a runway pair for which this procedure was not authorized.
3. The Cessna pilot had a landing gear problem; however, he did not advise the controller of the problem or of the risk that he may not be able to land on Runway 05 and stop before the intersection of Runway 33L.
4. The controller did not advise the Cessna pilot that a DC-9 aircraft was departing from Runway 33L at the same time the Cessna 206 was landing on Runway 05.
5. The controller did not advise the Cessna pilot of conflicting traffic when he issued evasive instructions, and he did not instruct the Cessna pilot to remain clear of Runway 33L.
6. The controller did not accurately assess the possibility of a go-around when planning the use of simultaneous procedures.

#### Findings as to risk

1. The aerodrome chart used by the DC-9 flight crew did not specifically identify LAHSO terminology in the depiction of LAHSO data for LBPIA, and as a result, the flight crew may not have been aware of which LAHSO operations were authorized.
2. There are no published air traffic control (ATC) procedures for aircraft to follow in the event a go-around is necessary by a landing aircraft after the pilot has accepted a hold short clearance and is unable to comply with the restriction.
3. The risk of an encounter by the Cessna 206 aircraft with the wake vortex of either a previously departed Boeing 737 aircraft or the DC-9 aircraft was not considered by the controller or the Cessna pilot.

#### Other findings

1. The LAHSO procedure used by the controller was not included on the automatic terminal information service (ATIS). This omission was not sufficient to alert the pilots of either aircraft that LAHSO was not an authorized procedure for this runway pair.

### TSB Final Report A03A0012—Loss of Directional Control

On February 2, 2003, a Boeing 737 was on a scheduled passenger flight from Ottawa, Ont., to Halifax International Airport, N.S. At approximately 21:07 Atlantic standard time (AST), Moncton area control center (ACC) cleared the

flight for the instrument landing system (ILS) approach for Runway 15. The ATIS report indicated that the ceiling at the airport was approximately 100 ft above ground level (AGL). During the descent, the crew were advised that the runway visual range (RVR) was 2 200 ft with the lights on strength five.

On landing, the pilot lost directional control of the aircraft after touchdown. The aircraft drifted to the left of the runway centreline, with the left wheel near the edge of the runway, before the captain regained directional control. After the incident, passengers were deplaned normally at the assigned gate. There were no injuries, and the aircraft was undamaged. The incident took place at 21:13 AST in the hours of darkness.

#### *Findings as to causes and contributing factors*

1. The crew's visual cues were degraded in the final moments of the approach because of a layer of ground fog, preventing them from detecting and correcting the aircraft's left drift prior to touchdown.
2. It is likely that a combination of drift, reverse thrust, strong gusting crosswind, and the wet runway resulted in the loss of aircraft directional control, and the continued application of right wheel braking throughout the loss of control may have delayed recovery of directional control.

#### *Other findings*

1. The standing water on Runway 24 prevented crews from using the best-equipped and most desirable runway for landing.
2. The installed flight data recorder (FDR) was the incorrect model for the aircraft and most of the required parameters were not being recorded.

#### *Safety action*

On February 4, 2003, the operator replaced the installed Fairchild F800 FDRs with the approved models. The operator has initiated a receiving inspection system for FDRs, and regular inventory audits will be completed to ensure that the correct spare parts are in stock.

As of September 25, 2003, the Halifax International Airport Authority had completed maintenance and modification on the drainage system around Runway 24 and on the collection pond. This included remedial work on the Runway 24 drainage system and installation of a water level alarm system and a remote pump shut-off switch to help control the water level in the collection pond. In addition, when weather forecasters are predicting heavy rain, airport authority personnel will shut off the pumps at the start of the rainfall.

## **TSB Final Report A03A0022—Loss of Control and Collision With Terrain**

On February 14, 2003, a single-engine Cessna 210N was en route from Narsarsuaq, Greenland, to Goose Bay, Nfld., a leg of a ferry flight from Prestwick, Scotland, to the United States. The pilot was conducting a straight-in precision radar approach to Runway 26 at Goose Bay in instrument meteorological conditions (IMC). Six nautical miles from the airport, the pilot radioed that the attitude indicator had failed. Shortly after the transmission, control of the aircraft was lost, and the aircraft struck the ice-covered surface of Hamilton Inlet, Nfld. Both the pilot and her daughter were fatally injured, and the aircraft was destroyed. The accident occurred in darkness at 18:09 AST.

#### *Findings as to causes and contributing factors*

1. For an unknown reason, the attitude indicator gyro stopped functioning during the approach to Goose Bay.
2. The aircraft was not equipped with a serviceable turn coordinator, which would have allowed the pilot to assess and correct the aircraft's flight attitude even after the attitude indicator had failed.
3. Control of the aircraft was lost, and the pilot was not able to recover from the spiral dive that ensued.



#### *Other findings*

1. The filed alternate airport, Churchill Falls, Nfld., was below approach limits at the expected arrival time.
2. The aircraft did not carry the fuel required for an alternate airport.
3. The aircraft did not have the necessary equipment to carry out an IFR approach at the alternate.
4. The emergency locator transmitter (ELT) battery was time expired and the ELT was not armed.
5. The flight was conducted in frigid temperatures with a failed aircraft heater.

## TSB Final Report A03C0094—Loss of Pitch Control and Collision With Terrain

On April 23, 2003, a Beech 99A was on a scheduled flight from Saskatoon, Sask., to Prince Albert, Sask., with two pilots and four passengers on board. The aircraft was approximately 4 000 ft above sea level (ASL) when the crew selected the flaps for the approach to Prince Albert. A bang was heard from the rear of the fuselage. The aircraft commenced an uncommanded pitch-up to a near-vertical attitude, then stalled, nosed over, and began a spin to the left. The crew countered the spin but the aircraft continued to descend in a near-vertical dive. Through the application of full-up elevator and the manipulation of power settings, the pilots were able to bring the aircraft to a near-horizontal attitude.

The crew extended the landing gear and issued a Mayday call, indicating that they were conducting a forced landing. The aircraft struck a knoll, tearing away the belly cargo pod and the landing gear. The aircraft bounced into the air and travelled approximately 180 m, then contacted a barbed-wire fence and slid to a stop approximately 600 m from the initial impact point. The crew and passengers suffered serious but non-life-threatening injuries. All of the occupants exited through the main cabin door at the rear of the aircraft. The accident occurred during daylight hours at 18:02 Central standard time (CST).

### *Findings as to causes and contributing factors*

1. During flight, the horizontal stabilizer trim actuator worked free of the mounting structure, and as a result, the flight crew lost pitch control of the aircraft.
2. During replacement of the horizontal stabilizer trim actuator, the upper attachment bolts were inserted through the airframe structure but did not pass through the upper mounting lugs of the trim actuator.
3. The improperly installed bolts trapped the actuator mounting lug assemblies, suspending the weight of the actuator and giving the false impression that the bolts had been correctly installed.



4. Dual inspections, ground testing, and flight testing did not reveal the faulty attachment.

### *Other findings*

1. The nature of the installation presents a risk that qualified persons may inadvertently install Beech 99 and Beech 100 horizontal stabilizer trim actuators incorrectly. There are no published warnings to advise installers that there is a potential to install the actuator incorrectly.

### *Safety action*

1. On May 2, 2003, the TSB issued an occurrence bulletin (A03C0094), detailing the factual information relative to this occurrence and the Beech King Air 100 occurrence of June 1999.
2. On June 20, 2003, the TSB forwarded a safety advisory regarding the facts of this occurrence to Transport Canada for potential safety action.
3. Transport Canada produced a service difficulty alert (AL-2003-07, dated 2003-07-17) based on TSB occurrence bulletin A03C0094, advising of the occurrence and indicating that the installation procedures in the maintenance manual are being reassessed.
4. Transport Canada contacted the U.S. Federal Aviation Administration (FAA), requesting their assistance and that of the aircraft manufacturer, suggesting issuance of a service letter and incorporation of warnings in the appropriate aircraft maintenance manuals.
5. Raytheon Aircraft issued King Air Communiqué No. 2003-03 to alert appropriate operators and maintenance personnel of the possibility of incorrect installation of the actuators. △

## **What is the Difference Between Air-Ground Communication and Air-to-Ground Communication?**

**The answer can be found in the *Glossary for Pilots and Air Traffic Services Personnel*!**

In 1987, the Canada Airspace Review recommended the development of a glossary of Canadian aviation terms in order to avoid misunderstandings between pilots, controllers, flight service specialists and other aerodrome users. This glossary, now known as the *Glossary for Pilots and Air Traffic Services Personnel*, is a joint initiative between Transport Canada, the Department of National Defence, and NAV CANADA. As part of the *A.I.P. Canada*, it serves mainly to highlight the differences between

Canadian terminology and definitions, and those from the International Civil Aviation Organization (ICAO) and the Federal Aviation Administration (FAA). We invite you to consult this valuable document, and share it with your friends and colleagues. You can access the Glossary online, or download it from the following address: [www.tc.gc.ca/CivilAviation/RegServ/terminology/glossary/menu.htm](http://www.tc.gc.ca/CivilAviation/RegServ/terminology/glossary/menu.htm). To order a paper copy, go to: [www.tc.gc.ca/transact/](http://www.tc.gc.ca/transact/). △



### **Near Miss at Uncontrolled Airport**

Dear Editor,

I am writing to you about an incident that occurred a few weeks after my commercial flight test, in hopes that it will help prevent similar situations from happening. A recently-licensed private pilot asked me to accompany him on a cross-country flight to Powell River, B.C., from Langley, B.C. The pilot, fresh out of training, flew to near perfection and handled the radio communications well. We switched to Powell River aerodrome traffic frequency as soon as we were released from terminal. There was no traffic on the frequency. We made the required call 5 min back, circled overhead 500 ft above the circuit to check the winds, and then descended on the upwind side to join the circuit via midfield downwind while making the appropriate radio calls in accordance with the *A.I.P. Canada* (AIP) RAC 4.5.

We were turning for final when we received a radio call from a helicopter that stated he was 1 mi. to the northeast, straight-in for the airport. This would put him at our two o'clock on the upwind side at an unknown altitude. This was his first and only call that we heard in our 15 min of monitoring the frequency. We did not spot him, so I decided to make an extra radio call to let him know where we were and that we could not see him. We got no reply.

I frantically scanned the sky and finally, when we were about 200 ft on final, I spotted him. He was on our right side on an angled straight-in, about 30° off the runway centreline. He was at about the same altitude, skimming over the treetops, and we were about to collide. This necessitated a dangerous collision avoidance turn on our part. This evasive action at an already slow speed and low altitude caused us to come close to a stall above the trees along the side of the approach path. We recovered from this very unnerving manoeuvre, completed another circuit and landed safely.

Afterwards, the helicopter pilot came over to us and apologized for the near collision. He told us that during his entire approach he didn't see us at all, and was not paying attention to the radio. I asked him, "Do helicopters have to follow the standard procedures for uncontrolled airports?" He replied, "We are supposed to, but I only do it if there is traffic." I suggested to him to read the AIP and study the uncontrolled airport procedures. Had he used the proper procedures, this situation would never have happened. We would have spotted each other much sooner and communicated to resolve any conflicts.

What made me upset about this situation was that this helicopter pilot decided not to follow the rules and regulations set out in the AIP and the *Canadian Aviation Regulations* (CARs), just to save a few bucks on fuel. What he did not realize was that his

actions jeopardized the safety of both of our aircraft and all of the occupants. These regulations were set up to standardize arrival and departure procedures at uncontrolled airports, to ease the task of maintaining separation and traffic spotting. If we were to all join the circuit in any way, without communicating our intentions, chaos would ensue.

Flying at controlled airports with the luxury of ATC only causes us to forget skills required for uncontrolled airports. I have even flown with instructors who did not know the procedures for uncontrolled airports very well. We must all take the time to regularly study and review the procedures found in the AIP, the CARs and the *Canada Flight Supplement* (CFS), and follow them. Personal and disciplined recurrent training will help eliminate situations such as our near miss near Powell River.

Jason Wannamaker  
Calgary, Alta.

Dear Jason,

*Unfortunately your incident is one of many which occur on a regular basis near our uncontrolled airports. The "big sky—small aircraft" principle has saved many pilots through luck—but others weren't so lucky. Many near misses and close calls never get reported. Hopefully your account will once again remind all of us of the importance to know our procedures well, and apply them in all cases. —Ed.*

### **Tribute to Rick Wynott—1951-2004**

On Sunday June 6, 2004, Rick Wynott of the Brampton Flying Club passed away unexpectedly at the age of 52. Rick Wynott was an integral part of the Brampton Flying Club for over 30 years. For most of his career, he acted as the chief flight instructor (CFI) of the Brampton Flying Club, one of the largest flight schools in Canada. Rick was responsible for transforming the Brampton Flying Club from a small grass strip airport to the world-class flight training facility it is today.

Since March 2003, he served as the general manager of the Brampton Airport and Flying Club. Rick was also a director on the board of the Air Transport Association of Canada (ATAC). His insight and experience have been sought after by flight schools across Canada and by both Transport Canada and the Transportation Safety Board of Canada (TSB). Rick Wynott was an innovative and pro-active leader in the world of flight training and aviation, and he will be greatly missed. △

## Answers to Self-Paced Study Program

1. an aircraft, vehicle or person
2. Flags, cones or wing bar lights would be installed to indicate the position of the displaced threshold.
3. /G
4. They do not provide the integrity needed for IFR operations.
5. 20 miles north of Toronto; 20 DME north of Toronto.
6. The manufacturer's name or type of aircraft, followed by the last four letters of the registration.
7. 122.75
8. taxi clear of the landing area in use
9. four
10. TAF
11. 12
12. FZRA
13. 29th; 2000
14. 800 ft broken
15. 300° true, 15 kt with gusts to 25 kt
16. light snow and moderate blowing snow
17. SIGMET
18. frequency congestion
19. (a) no cloud below 5 000 ft or below the highest minimum sector altitude, whichever is higher, and (b) a visibility of 6 SM or more; (c) no precipitation, thunderstorms, shallow fog, or low drifting snow.
20. 7500
21. any airborne and ground objects or activities which appear to be hostile, suspicious, unidentified or engaged in possible illegal smuggling activity.
22. 18 000
23. then to fly for 45 minutes at normal cruising speed;
24. chrome yellow and black strips painted on pylons or roofs; 2 000
25. calling 1 888 226-7277; two; 48
26. 5; 5
27. National; FIR; Aerodrome
28. Dry chemical and Halon.
29. 50
30. Runway 11/29, temperature -20°C, average CRFI .25
31. .39 to .41
32. always cross at a tower
33. 20
34. lift
35. heavy; clean; slow
36. free of frost, ice or snow contamination
37. sense of depth and orientation
38. seriously impair the judgement and co-ordination needed by the pilot

## A Tip on Standard Instrument Departures (SID)

by André Vautour, Civil Aviation Safety Inspector, System Safety, Atlantic Region, Transport Canada

For those of you who fly IFR, you are well aware that SIDs are an effective and safe way to get you from your departure point to your next destination. Most IFR airports with radar coverage in Canada have SIDs, and the majority of them are relatively simple (e.g. climb runway heading for vectors and maintain XXXX ft ASL).

A SID violation does not happen very often; however, when it does, it's usually the routing part that is not complied with. Currently, two airports in Canada are competing for the title of most SID

violations. If you think it's the busiest airports that are affected (i.e. Toronto, Vancouver, etc.), you are wrong! Saint-John (CYSJ) and Fredericton (CYFC) have led the country for most SID violations in the past year. Airlines, corporate aviation and private operators have all committed these violations on occasion. At the present time, the issue is under review by Transport Canada. Please be vigilant when following the SIDs instructions, particularly from these two airports. △

## Managing Collision Risk in Class G Airspace in Canada *cont. from page 16*

other VFR flights. Conflict resolution between VFR flights is available upon request, equipment and workload permitting.

**Class D:** IFR and VFR flights are permitted; all flights are provided with ATC services, IFR flights are separated from other IFR flights, and receive traffic information in respect of VFR flights. VFR flights receive traffic information in respect of all other flights. Conflict resolution between VFR flights is available upon request, equipment and workload permitting.

**Class E:** IFR and VFR flights are permitted; IFR flights are provided with ATC services, and are separated from other IFR flights. All flights receive traffic information as far as is practical.

**Class F/G:** All other airspace is either class G uncontrolled airspace or class F special use airspace.

**In conclusion, if you are a pilot flying in class G airspace, the responsibility for collision avoidance is all yours—you have control!** △

**THE TIME INVESTED IN PROPERLY BRIEFING YOUR PASSENGERS...  
COULD END UP BEING THE BEST INVESTMENT YOU EVER MADE.**

# Managing Collision Risk in Class G Airspace in Canada

by Don Henderson, Manager, Level of Service and Aeronautical Studies, NAV CANADA

During the course of recent consultation and other meetings held between NAV CANADA and various air carriers and pilots, concerns have arisen with respect to operating practices in class G airspace—particularly in the vicinity of high-density airports. These concerns focus around the following areas: pilot assumptions with respect to services provided by air traffic control (ATC); pilot vigilance; use of VFR routes, transit routes and associated reporting points; and communication practices.

## The systems approach

Managing the risk of collision between aircraft is one of the primary goals of the air traffic management system. This can only be accomplished within a “total system” framework where user-conduct rules are harmonized with service provision. Understanding the contribution that each element makes to overall system safety performance is essential in effectively reducing collision risk.

## Risk and defensive barriers

There are three fundamental techniques that can be employed to manage the risk of collision. The first is to design airspace and conduct flight operations so as to preclude the opportunity for conflict or risk of collision. Examples of this are to specify flight along non-intersecting tracks or to define a volume of airspace for the exclusive use of one user.

A second technique is to alter flight trajectories to resolve conflicts and avoid collisions. Examples of this include the directions pilots receive from ATC when being “vectored.”

Finally, the “rules of the air” are applicable to pilots, and compliance introduces a proven defence barrier against collision risk.

In practice, the risk of collision is not normally managed by the application of one technique or the other, but by practices and procedures that to some extent employ all three techniques. Thus, classes of airspace, the provision of ATC services, radar or some other means of surveillance or position reporting, communications and regulations (rules of the air) come together to create an operating system.

In addition, arrival and departure procedures, routes and airways are designed to further facilitate a safe and efficient operating environment. This system can have different configurations and components depending on traffic volume and complexity. For controlled airspace, these defensive barriers can be expected to perform in a predictable way.

## Class G airspace

For uncontrolled airspace (class G), it is different. While VFR routes, transit routes, reporting points and recommended practices can be put forward, they are not fully supported through regulations, and depend on pilots understanding the system and doing the right thing—the right thing is called airmanship.

If pilots use the system in the way it is intended to be used, they can reduce their risk and improve efficiency of their operations. If “ad hoc” procedures are

applied, if pilots decide that “this is the way we have always done it” or “it’s quicker this way, and anyway, I don’t have to do it that way” then there may be unintended negative consequences.

Pilots are solely responsible for traffic separation in class G airspace. Avoiding conflicts requires pilots to communicate with each other on appropriate frequencies, advise of their intentions, and plan accordingly.

If there are specific recommended practices for an area, such as VFR routes, transit routes, reporting points or an aerodrome traffic frequency (ATF), pilots’ voluntary compliance is required to ensure the system performs as intended, and that acceptable safety is achieved.

In some instances, ATC or flight service specialists may provide additional information, including traffic information, if their workload permits. This in no way implies that pilots are being provided separation, or their flight is being controlled in any way. The pilots are entirely responsible for flying the aircraft.

## About VFR routes

VFR routes or transit routes are often published in order to reduce the risk of collision in heavily-traveled VFR corridors as well as to provide an aid to ATC for the purposes of expediting arrivals and departures from airports.

VFR routes are advisory; that is, they are not mandatory, but adherence to the routes reduces the risk of conflicts.

## See and avoid

Pilots are expected to follow the rules by flying the appropriate altitudes, communicating when required, and conforming to recommended practices to reduce the probability of conflict. The “see and avoid” concept still plays a key role and requires vigilance on the part of pilots—particularly in high-traffic areas.

In the future, technology will provide pilots with a traffic picture in the cockpit to assist with reducing collision risk. Even then, there will be no substitute for a good look out.

## Airspace classification system

The airspace classification system defines the air traffic services (ATS) provided, and pilot responsibilities.

The classes applicable to the provision of ATC services are:

*Class A:* Only IFR flights are permitted; all flights are provided with ATC services, and are separated from each other.

*Class B:* IFR and VFR flights are permitted; all flights are provided with ATC services, and are separated from each other.

*Class C:* IFR and VFR flights are permitted; all flights are provided with ATC services, and IFR flights are separated from other IFR flights, and provided with conflict resolution from VFR flights. VFR flights are provided with conflict resolution from IFR flights, and receive traffic information in respect of

cont. on page 15



## Flight Crew Recency Requirements Self-Paced Study Program

Refer to paragraph 421.05(2)(d) of the Canadian Aviation Regulations (CARs).

This self-paced study questionnaire is for use from September 30, 2004, to September 29, 2005.

When completed, it satisfies the 24-month recurrent training requirements of CAR 401.05(2)(a).

It is to be retained by the pilot.

Note: The answers may be found in the A.I.P. Canada; references are at the end of the questions.

Amendments to this publication may result in changes to answers, references, or both.

1. A runway incursion is any occurrence at an airport involving the unauthorized or unplanned presence of \_\_\_\_\_ on the protected area of a surface designated for aircraft landings and departures. (GEN 5.1)
2. How are temporarily displaced thresholds marked? \_\_\_\_\_. (AGA 5.4.1, NOTE)
3. On a VFR flight with a panel-mount or hand-held GPS, what letter should be entered in the Flight Plan under item 10: Equipment? \_\_\_\_\_. (COM 3.16.4.2.2)
4. Why shouldn't a hand-held or panel-mount VFR GPS be used for IFR? \_\_\_\_\_. (COM 3.16.9)
5. How would you state that you are 20 miles north of Toronto if you were using GPS? \_\_\_\_\_; using DME? \_\_\_\_\_. (COM 5.6)
6. What aircraft information should be included on initial radio contact to identify a Canadian private aircraft? \_\_\_\_\_. (COM 5.8.1)
7. In the Canadian Southern Domestic Airspace (SDA) the correct frequency for air-to-air communication is \_\_\_\_\_ MHz. (COM 5.13.3)
8. A series of red flashes from the tower, directed at an aircraft on the ground means \_\_\_\_\_. (RAC 4.2.11)
9. Aerodrome forecasts are generally prepared \_\_\_\_\_ times daily. (MET 1.3.4)
10. The international meteorological code for an aerodrome forecast is \_\_\_\_\_. (MET 1.3.4 and 3.9.1)
11. The IFR outlook in a GFA covers an additional \_\_\_\_\_ hour period. (MET 3.3.2)
12. The abbreviation for freezing rain is \_\_\_\_\_. (MET 3.3.5 and 3.15.3)

**METAR CYXE 292000Z 30015G25KT 3/4SM R33/4000FT/D -SN BLSN BKN008 OVC040 M05/M08 A2985**

13. The above METAR for Saskatoon was issued on the \_\_\_\_\_ day at \_\_\_\_\_ Z. (MET 3.15.3)
14. In the above METAR, the ceiling is \_\_\_\_\_. (MET 3.15.3)
15. In the above METAR, the wind is \_\_\_\_\_. (MET 3.15.3)
16. In the above METAR, the weather phenomena are \_\_\_\_\_. (MET 3.15.3)
17. A message that is intended to provide short-term warning of certain potentially hazardous weather phenomena is called a \_\_\_\_\_? (MET 3.18)
18. The purpose of ATIS is to improve controller and flight service specialist effectiveness and to relieve \_\_\_\_\_. (RAC 1.3)



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19. "CAVOK" means the simultaneous occurrence of the following meteorological conditions at an airport:
- \_\_\_\_\_;
  - \_\_\_\_\_;
  - \_\_\_\_\_. (RAC 1.4)
20. The transponder code for a hijacked aircraft is \_\_\_\_\_. (RAC 1.9.8)
21. A pilot should file a CIRVIS report immediately upon a vital intelligence sighting of \_\_\_\_\_  
\_\_\_\_\_. (RAC 1.12.2)
22. Low Level airspace consists of all the airspace below \_\_\_\_\_ ft ASL. (RAC 2.3)
23. An aircraft, other than a helicopter, operating VFR flight at night shall carry an amount of fuel that is sufficient to fly to the destination and \_\_\_\_\_  
\_\_\_\_\_.  
A helicopter must carry \_\_\_\_\_ minutes. (RAC 3.13.1)
24. Fur farms may be marked with \_\_\_\_\_.  
Pilots should avoid overflying fur and poultry farms  
below \_\_\_\_\_ ft AGL. (RAC 1.14.1)
25. On flights from the U.S. to Canada, pilots must make their own customs arrangements by \_\_\_\_\_  
at least \_\_\_\_\_ hours but not more than \_\_\_\_\_ hours before flying  
into Canada. (FAL 2.3.2)
26. Any testing of an emergency locator transmitter (ELT) must be conducted only during the first \_\_\_\_\_ minutes of any UTC hour and restricted in duration to not more than \_\_\_\_\_ seconds. (SAR 3.8)
27. The three categories of Canadian domestic NOTAM files are \_\_\_\_\_, \_\_\_\_\_, and \_\_\_\_\_. (MAP 5.6.8)
28. Which types of extinguishers are acceptable for Class A, B, and C fires?  
\_\_\_\_\_ (AIR 1.4.3)
29. An aircraft altimeter with the correct altimeter setting applied should not have an error of more than +/- \_\_\_\_\_ ft. (AIR 1.5.1)
30. **CYQU CRFI 11/29 -20 .25 0412111030**  
Decode this CRFI report for Grande Prairie, \_\_\_\_\_  
\_\_\_\_\_. (AIR 1.6.4)
31. A runway covered with packed and sanded snow has an equivalent CRFI value of \_\_\_\_\_. (AIR 1.6.6, Table 4)
32. When crossing over power lines at low altitude, the only way to be safe is to avoid the span portion of the line and \_\_\_\_\_,  
maintaining a safe altitude, with as much clearance as possible. (AIR 2.4.1)
33. Whenever possible, pilots should avoid any thunderstorm identified as severe by at least \_\_\_\_\_ NM. (AIR 2.7.2)
34. Wake turbulence is caused by wing tip vortices and is a by-product of \_\_\_\_\_. (AIR 2.9)
35. The greatest wing tip vortex strength occurs under conditions of \_\_\_\_\_ weight, \_\_\_\_\_ configuration, and \_\_\_\_\_ speed. (AIR 2.9)
36. In "The Clean Aircraft Concept," it is imperative that takeoff not be attempted in any aircraft unless all critical components of the aircraft are \_\_\_\_\_. (AIR 2.12.2)
37. Whiteout is an atmospheric optical phenomenon in which \_\_\_\_\_  
\_\_\_\_\_ is lost; only very dark, nearby objects can be seen. (AIR 2.12.7)
38. Simple remedies, such as antihistamines, cough and cold mixtures, laxatives, tranquilizers and appetite suppressants may \_\_\_\_\_  
\_\_\_\_\_. (AIR 3.12)

