Transport Canada Transports Canada

Aviation Safety Letter

Learn from the mistakes of others and avoid making them yourself . . . Issue 3/2001

Destination, destination, destination!

On February 27, 2000, a Piper Navajo departed Edmonton, Alberta, on an instrument flight rules (IFR) charter flight to Stony Rapids, Saskatchewan, with one pilot and six passengers on board. The pilot conducted a non-directional beacon (NDB) approach at night in Stony Rapids, followed by a missed approach. He then attempted and missed a second approach. At about 2200, while the pilot was manoeuvring to land on Runway 06, the aircraft struck trees 3.5 NM west of the Runway 06 button and roughly 0.25 NM left of the runway centreline at an altitude of 1200 ft ASL. The aircraft sustained substantial damage, but no fire ensued. The pilot and one passenger were seriously injured, and the remaining five passengers sustained minor injuries. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A00H0001.

The airport at Stony Rapids has a single NDB approach with a minimum descent altitude (MDA) of 1500 ft ASL. The aerodrome elevation is 805 ft ASL. The weather at the time of the accident included the following: ceiling 300 ft AGL, three miles visibility, and calm winds. A report was taken after the accident, and it indicated deteriorating conditions with a ceiling of 200 ft AGL and a visibility of one mile. The weather at the alternate aerodrome in Fort McMurray, Alberta, was forecast to have scattered clouds at 7000 ft AGL with a visibility of more than six miles.

The pilot had a lot of experience flying in the northern Saskatchewan environment and was well rested. Based on weather information, it was necessary to conduct an instrument approach at the destination. Because of the height of the ceiling, the pilot was not able to carry out a visual circling procedure and land on completion of his first NDB approach; instead, he executed a missed approach. He indicated to the Regina Remote Communications Outlet (RCO) that he would fly to Fond-du-Lac, Saskatchewan, after his second approach if he was not able to land. The pilot knew that he did not have keys for the

company accommodations available in Fond-du-Lac.

Following his second approach, he started heading for Fond-du-Lac but changed his mind when he was able to see the runway momentarily. He then reverted to a visual approach and turned toward the airport in an attempt to fly under the cloud base. In trying to line up for a visual approach for Runway 06, he ended up over higher ground in very poor weather conditions. Clouds were becoming thicker and closer to the ground as he was progressing toward the airport. While he was trying to acquire sight of the airport environment, using mainly ground references to provide vertical separation, the aircraft contacted the trees and crashed a few seconds after the landing gear had been selected down.

During flight, particularly at night in overcast conditions, perception of the horizon may be affected by false visual cues. When flying in conditions where no stars are visible as a result of overcast conditions, unlighted areas of terrain can blend in with the dark overcast sky to create the illusion that the unlighted terrain is part of the sky. When the horizon is obscured by low cloud or fog, the edge of the clouds tends to be perceived as the horizon; thus, it is perceived to be lower on the windshield than it actually is.

Analysis—The aircraft was overweight by about 115 lb on takeoff, and the centre of gravity was slightly aft of limits. Although these factors did not

TP 185E
ISSN 0709-8103

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contribute to the occurrence, the overweight and aft centre of gravity were a risk to safe operation of the aircraft. The pilot was well aware of the prevailing weather conditions at the destination airport. During his first approach, he would have become aware of the prevailing ceiling and visibility at the airport.

Upon completion of his second approach at Stony Rapids, as he was proceeding toward Fond-du-Lac, the pilot was able to see the runway momentarily. As a result, he decided to turn toward the airport and conduct a visual approach. As he progressed in the poor weather conditions, trying to visually acquire the runway environment, the visibility gradually decreased. The trees became his main reference, resulting in a lack of awareness of the actual separation between the aircraft and the ground. It is also probable that the pilot perceived the edge of the clouds as the horizon, thus perceiving the natural horizon to be lower on the windshield than it really was. The tendency is to feel that the nose of the aircraft is too high and there is a strong urge to lower it.

The company's remuneration structure does not penalize flight crews who have to proceed to an alternate aerodrome, and arrangements could have been made to provide accommodation to the passengers and crew in many locations in northern Saskatchewan. It was also determined that there was no pressure from management to influence the pilot to land at the destination airport. The pilot knew that he had a flight the next day, and he felt the need to reach the destination and be ready for the next day. The fact that the pilot did not have the keys for the available accommodations in Fond-du-Lac was also a factor in his persistence to land in Stony Rapids rather than proceed to his selected alternate aerodrome. It is also likely that the pilot's decision was shaped by his perception of the low risk involved, his determination to succeed, and the accepted nature of this practice among pilots operating in remote communities with non-precision approaches.

As individuals gain experience performing tasks, their attitudes and perception of risk involved in those tasks often change. The more often they successfully complete the task, the less they believe the risks to themselves to be. Problems arise when the perceived risks no longer match the actual risks and dangers involved in an activity. As the subjective evaluation of personal risk decreases, the frequency of high-risk practices increases. Also, as group values shift, more adventurous decisions become normal and accepted within a given community. The conduct of low visibility visual approaches is a well-documented example of a high-risk activity that is not uncommon among pilots operating in remote locations without the benefit of precision landing aids.

The old "location! location! location!" adage may get us a nice home, but let's not turn it into "destination! destination! destination!" or we'll end-up buying the farm. △

Gauging Your Pilot Decision Making

by Dan Slunder, Civil Aviation Inspector, Transport Canada

Recently, I read of a pilot in a single-engine airplane who experienced an engine problem and did everything but, just before landing, changed his plan and proceeded on to his intended destination. Although he had an oil pressure gauge that read "0," he reasoned that since the engine made it to his alternate field, the problem was clearly the gauge. He overflew his alternate airport and proceeded to his original destination.

Is this good pilot decision making? What external pressures influenced this pilot? Was his diagnostic skill brilliant or dangerous? Moreover, will he repeat this type of assumption the next time that he has a problem? Will he bother to divert? If you were to have an indication that something was wrong with your engine, what would you do?

Good pilot decision making requires that you maintain control, assess the problem, gather information, assess all options (i.e., make a plan), and monitor the results. Getting on the ground safely should be the first priority.

I own a 1952 Piper Tri-Pacer, and a few years ago when my work brought me to Labrador, I thought flying there with my wife and daughter would be a memorable adventure. Indeed it was. For the most part, everything went as planned. During the three hours direct from Sept Îles, Quebec, to Goose Bay, Labrador, I had lots of time to think. One of my first thoughts was how much faith we pilots place in an engine. The terrain from Sept Îles to Goose Bay is very rugged and inhospitable. It offers precious few places to let down in an emergency. I kept a close watch on my engine instruments and frequently checked for carburettor icing. I had prepared a plan in case I experienced engine problems, and I noted all possible forced landing sites. Although nothing happened on my trip to Goose Bay, I planned a different route along a winding dirt road upon leaving just in case. It was much longer but safer.

Pilot decision making is about making an intelligent plan, modifying it when things aren't right, and following it through without second-guessing. △

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

New TC Book—Sharing the Skies: An Aviation Industry Guide to the Management of Wildlife Hazards

For many years Transport Canada (TC) officials from the Aerodrome Safety Branch have been involved in raising awareness and providing education about airport wildlife management. TC publications include the *Wildlife Control Procedures Manual* (1994), a series of airport wildlife management bulletins (ongoing since 1978), posters, training videos and a Web site < *http://www.tc.gc.ca/aviation/aerodrme/birdstke/main.htm* >. TC was also involved in the writing of *Bird Hazards to Aircraft* (1976) by Dr. Hans Blokpoel.

TC has recently completed a new book for the aviation industry—*Sharing the Skies: An Aviation Industry Guide to the Management of Wildlife Hazards*. Excellent reports and research from around the world are referenced throughout the book. The purpose of Sharing the Skies is to

(i) present relevant and comprehensive background information to aviation professionals on the nature and magnitude of the bird- and mammal-strike problem; and

(ii) describe and recommend effective strategies available to the aviation community to reduce the risk associated with wildlife strikes.

In conjunction with the publishing of Sharing the Skies, Transport Canada is also amending the *Wildlife Control Procedures Manual*, with a proposed completion date of Aug. 15, 2001. The new manual will serve as the tactical guide for wildlife risk management activities and shall be used as a complement to the strategic direction provided by Sharing the Skies.

Why now? TC produced Sharing the Skies for several reasons:

- damage costs caused by bird and mammal strikes are higher than previously estimated;
- recent fatal accidents involving large military aircraft have been well documented;
- there are growing populations of hazardous bird species; and
- there is a need to get new stakeholders more involved in wildlife management as TC has moved from being an operator, regulator and service provider to being a regulator and overseer of the civil aviation system.

System Safety Approach—Sharing the Skies is based on system safety—an approach used in many operational communities (e.g., manufacturing, petrochemicals, health care, transportation) where there is a need to apply specialized skills in a co-ordinated and purposeful manner. It is the first book to bring a comprehensive, system safety approach to wildlife-related decision making in the aviation community.

TC officials and others involved in wildlife management view Sharing the Skies in conjunction with the *Wildlife Control Procedures Manual* as a solid foundation for managing wildlife risks. The challenge for members of the aviation community is to implement the ideas in these publications. The challenge for TC officials is to keep these publications current as new information becomes available and new management techniques are developed and tested.

The operators of all Canadian-certified and -registered aerodromes will be receiving a copy of Sharing the Skies as part of TC's safety promotion program. To purchase copies of Sharing the Skies (TP 13549E), please contact the TC Civil Aviation Communication Centre at 1-800-305-2059 or visit the following Web site: < *http://www.tc.gc.ca/aviation/pubs/index_e.htm* >.

Ms. Elaine Parker Receives the Transport Canada Aviation Safety

Mr. Art LaFlamme, Director General Civil Aviation, presenting the award to Ms. Elaine Parker.

Mr. Art LaFlamme, Director General Civil Aviation, presented the 2001 Transport Canada Aviation Safety Award to Ms. Elaine Parker, from the flight safety department of Air Canada Regional Airlines. Ms. Parker's long-term commitment and personal dedication to the advancement of aviation safety are being recognized by presenting her with this prestigious award.

Ms. Parker has been involved in aviation since 1974. Shortly after completing the Aviation Technology program at Selkirk College in Castlegar, British Columbia, she started her flying career as a pilot and dispatcher for North Cariboo Air. Very early in her flying career, she became interested in aviation safety. She attended the first Transport Canada (TC) Company Aviation Safety Officer course held in Edmonton in April 1984.

As North Cariboo's safety officer, she began to self-fund and continue her education in both aviation safety and in occupational safety and health. Her knowledge and experience is wide, gained over the years in a variety of jobs for different employers. Elaine was Director of Flight Operations for North Cariboo Air, and then she transferred to Time Air Inc., where she was Manager of Charter Operations and later the first Manager of Safety. She began teaching at the University of Southern California's Aviation Safety Certificate Program in her spare time (an activity that she continues to this day).

Ms. Parker worked for TC as a regional aviation safety officer in Toronto and later as the regional director of System Safety in Winnipeg, where she worked extensively, among several projects, on the company aviation safety officer program. Ms. Parker left TC in 1994 to become the Director of Safety at Canadian Regional Airlines. Ms. Parker has always been willing to put in extra time or effort to assist new safety officers and other companies in developing their safety programs. Notably in 1999, company safety training videos were made widely available to the industry in trade for other information or training materials. Hundreds of these videos have been distributed throughout Canada and worldwide.

For the past six years she has been the Vice-President of the Canadian Society of Air Safety Investigators. In addition, she has been delivering courses on blood-borne pathogens and organizing media training opportunities. Ms. Parker is active internationally and has sat on various committees and working groups over the years. She is currently on the advisory committee for the Southern California Safety Institute's Cabin Safety Symposium.

The Transport Canada Aviation Safety Award was established in 1988 to foster an awareness of aviation safety in Canada and to recognize persons, groups, companies, organizations, agencies or departments that have contributed, in an exceptional way, to this objective. The award was presented in Ottawa, Ontario, on May 15, 2001, at the 13th annual Canadian Aviation Safety Seminar (CASS 2001), a major industry event hosted annually by TC for all sectors of the aviation community.

CASS 2001 built-up on CASS 2000 by providing concrete strategies for the aviation industry to implement safety management systems. CASS 2001 was a great success, thanks to the efforts of the Civil Aviation Safety Services staff, several other TC volunteers, guest speakers, workshop facilitators, sponsors, and of course, the delegates.

At the closing of the conference, Mr. Roger Beebe, Regional Director Civil Aviation, Prairie and Northern Region, accepted the baton for next year's CASS 2002, which will be held at the Westin Hotel in Calgary, Alberta, from March 18 to 20, 2002. We hope to see you in Calgary! △

When in Doubt Booklets

Updated versions of the booklets *When in Doubt . . . Small and Large Aircraft* (TP 10643, Fifth Edition, December 2000) and *When in Doubt . . . Ground Crew* (TP 10647, Fourth Edition, January 2001) are now available on Transport Canada's Web site in English and French. Look for the new versions at < *http://www.tc.gc.ca/aviation/general/fltcrew/index.htm* >.
Copies of these booklets, as well as the videos *When in Doubt . . . Small and Large Aircraft* and *When in Doubt . . . Ground Crew,* may also be obtained from the Civil Aviation Communications Centre.

Civil Aviation Communications Centre, toll-free: 1-800-305-2059
In the national capital area: (613) 993-7284, http://www.tc.gc.ca/aviation

Stall/Spin Training

by Jim McMenemy, Human Factors Specialist, Transport Canada Civil Aviation

You may have heard that there have been changes to the training and testing of spins and stalls in the private pilot licence (PPL) flight test. We thought some of you would be interested in reading about some of the factors that led to the changes and exactly what it is that changed.

Canada was the last major civil aviation authority to test spin recovery in the private pilot flight test, but there was no difference between Canada and other nations in terms of stall/spin accident rates. A number of fatal spin accidents led the TC Flight Training Division to decide to evaluate the Canadian approach to stall and spin training and testing from a human factors perspective.

We found 39 stall and spin accidents involving single-engine and light twin certified aircraft over the past 10 years. These were studied, and the analysis team found some interesting patterns.

Aircraft Handling—Most of the stalls occurred at low altitude, during takeoff or landing, or at low airspeed. The analysis team concluded that most of the pilots failed to recognize the developing stall. If a pilot's experience does not go beyond the basic straight-ahead, power-off stall and spins, it is very possible that he/she will not recognize the situation and will not take action in time to prevent the full stall.

Coping with Emergencies—Historically, the forced landing is the most difficult exercise on PPL flight tests. It is a complex exercise and, even in a practice environment, is inherently stressful. Although forced landings are rare, the consequences of inadequate performance are dire, and the word we have is that forced landings are not routinely practised by many general aviation pilots.

Currency and Skill Decay—Different types of skills, once learned and not practised for periods of time, will degrade at different rates. Continuous movement skills, such as steering, guiding or tracking, are relatively impervious to decay. Skill at decision making, recalling bodies of knowledge, and tasks requiring verbal communication, however, is subject to fairly rapid decay if not practised.

Pilots who have not flown for a while could be misled in certain situations. They might expect to be a little rusty, but once in the aircraft, they find that the stick and rudder skills are intact. In fact, the skill decay is hidden and may not become apparent until the pilot is faced with an emergency or complex situation. To preclude this, infrequent fliers should engage in a periodic review or refresher activity to ensure that the relevant knowledge is available for recall and the information processing and decision-making skills stay sharp.

Take-off Planning on Floats—A number of float-equipped aircraft stalled during the climb out after taking off because the pilot had selected an inadequate take-off route. The human perceptual system is not good at judging absolute distances. Seaplane training should include information on how susceptible we are to misjudging distances as well as techniques to assess the adequacy of a take-off area.

Effects of Weight and Balance—During flight training the aircraft is usually light. Student pilots learn about weight and balance, but the experience of flying a heavy aircraft may be very different. A low-time pilot flying an aircraft at or near maximum gross weight for the first time may be very surprised at the handling characteristics.

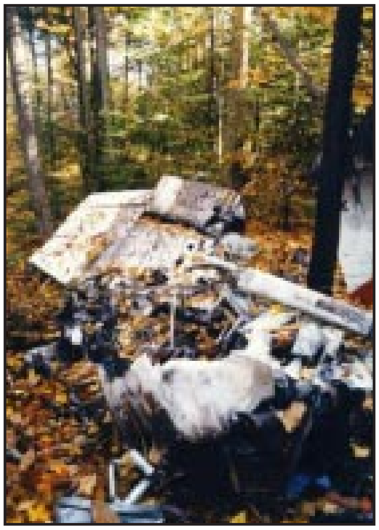
Turn Back After Takeoff—Several stalls occurred when pilots turned back to the runway after the engine failed. Typically, guidance on this topic recommends that the pilot land straight ahead unless the aircraft has enough altitude to make the turn back to the runway. How much altitude is enough? In a critical situation, the pilot is better off not having to consider this question. If an engine failure after takeoff results in an accident, the pilot is eight times more likely to be killed or seriously injured turning back than landing straight ahead.

Stall prevention must be the aim, and the key to prevention is recognition. In real life, once the spin develops, we are too often faced with an accident in progress. The situation will not be improved by simply removing, or maintaining, the spin in the PPL flight test. Here are some of the concrete steps TC is taking to reduce the number of stall and spin accidents:

1. Replace the spin on the PPL flight test with a second stall, an advanced stall.
2. Place more emphasis on the proficiency of private pilot students in recognizing and recovering from advanced stalls.
3. Give examiners better guidance on how to test the advanced stall.
4. Require that spins and the correct recovery technique continue to be demonstrated during private pilot training.
5. Sample advanced stalls more heavily on instructor rating flight tests.
6. Emphasize the teaching of advanced stalls on instructor refresher courses.
7. Continue to require spin training and testing for commercial pilots but use the development of the integrated commercial course to give more specific recommendations for improvement.
8. Enhance training in the teaching of spins during instructor rating training.

If you have any questions on the above subject, do not hesitate to contact your regional TC office for clarification. △

Think Again Before Attempting a Cloud-breaking Procedure



On October 10, 1999, a Cessna 172M departed Bancroft, Ont., at 0915 on a local visual flight rules (VFR) sightseeing flight. Approximately 15 min after takeoff, the pilot encountered deteriorating weather and elected to return to Bancroft. The pilot, who had a valid instrument rating, climbed into cloud instead of attempting to maintain VFR in weather that he assessed to be unsuitable for continued VFR flight. With the aircraft automatic direction finder (ADF) tuned to the local broadcast radio station, the pilot flew in instrument meteorological conditions (IMC) at 2600 ft ASL in the vicinity of the Bancroft aerodrome, waiting for the weather to improve. After approximately one hour in solid IMC, the pilot climbed to about 3000 to 4000 ft ASL and contacted Toronto Radio for the latest weather. His fuel supply was running low and, with no observable improvement in the weather, he decided to attempt a landing at Bancroft aerodrome.

The pilot descended to about 300 to 400 ft AGL before regaining visual reference to the ground in an area where the visibility was one-quarter mile in fog. He then turned the aircraft to a southerly heading in an attempt to set up for a visual approach to Runway 12 at Bancroft. He turned to what he estimated to be the final approach course but encountered rising terrain. The aircraft struck trees and crashed on a wooded hillside approximately one mile west of the aerodrome at 1106. The pilot and two passengers evacuated the aircraft with minor injuries, and the aircraft was consumed by a post-crash fire. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A99O0242.

Prior to leaving home on the day of the occurrence, the pilot checked the weather on the Internet. He then observed the weather during his drive to the aerodrome and on arrival, he called the Kingston Flight Service Station (FSS) for the forecasts for Muskoka, 60 NM west, Peterborough, 55 NM south, and the surrounding areas. The only weather information available for the Bancroft aerodrome was the area forecast (FA) and the report from the automated weather observation system (AWOS). No terminal aerodrome forecast (TAF) or aviation routine weather report (METAR) was available for the Bancroft aerodrome. The forecasts for Muskoka and Peterborough called for low visibility in fog throughout most of the morning. The report from the AWOS at Bancroft aerodrome, which the pilot did not check, was showing light winds and 100% relative humidity throughout the morning.

Based on the weather that the pilot observed at the aerodrome and during the drive to work, he elected to conduct the first scheduled sightseeing flight. He took off at 0815 and flew an uneventful half-hour flight during which he observed the weather to be quite acceptable for VFR flight. He estimated the ceiling to be at 1500 ft AGL and well defined, with an in-flight visibility of eight to ten miles. After landing at approximately 0845, he telephoned the Kingston FSS to give a pilot report (PIREP) based on having observed weather that was significantly better than forecast.

The pilot did not add fuel before the next flight since he estimated the aircraft fuel to be 15 to 16 gal., or 1 hr. and 45 min of fuel on board, which would have been adequate for the scheduled one-hour flight. After filing a VFR flight plan and briefing his passengers, he departed at 0915. When he encountered deteriorating weather, he elected to climb into IMC during the return to Bancroft, although he did not carry instrument flight rules (IFR) publications. His only navigation aid was the ADF. The Bancroft aerodrome is not equipped with any instrument approach aid, so the pilot used the local broadcast radio station as a navigation aid and set up a holding pattern at 2600 ft ASL in the vicinity of the aerodrome.

After holding in solid IMC in controlled airspace for approximately one hour, the pilot climbed to between 3000 and 4000 ft ASL and was able to communicate with Toronto Radio. He was still in IMC and the quality of the radio reception was poor, but he was successful in determining the weather in Muskoka and in Peterborough.

With his fuel supply now running low, the pilot decided that he had no option but to try to land at Bancroft. He descended to 2600 ft ASL and, using the local broadcast radio station for navigation, fixed the aircraft position over the aerodrome and began a gradual descent to the north over known flat terrain. The pilot descended until he gained visual reference with the ground at 300 to 400 ft AGL. He estimated the visibility at this altitude to be one-quarter mile. He recognized the terrain and was relatively sure of his position, so he turned to the south and attempted to set up for a close-in left base for Runway 12.

Using very limited visual cues and the ADF, the pilot turned for Runway 12 when he believed he was lined up with the runway, although he could not see the airfield. His position was actually further south and west of the airfield than he had expected. The aircraft struck trees and crashed on a hillside approximately one mile west of the aerodrome.

The pilot had 6.2 hr. of experience in actual IMC, 65 hr. of simulated IMC, and 24 hr. in simulators. The pilot had only filed an IFR flight plan on one occasion.

Analysis—Although the forecasts for Muskoka and Peterborough called for low visibility in fog, the pilot was influenced by the relatively good weather that he observed both at the airfield and during his drive to work. The decision to fly the occurrence flight was based on the weather he observed during the first flight. He did not use all of the weather information available to him since he did not check the AWOS readout. Fog could quickly form in the Bancroft area because of the light winds and 100% relative humidity.

When the pilot decided to climb, though this action would place him in solid IMC conditions, he expected to fly quickly through a very localized patch of weather and then regain visual meteorological conditions (VMC). At no time did the pilot attempt to change to an IFR flight plan. Based on available weather reports for the area and the clouds observed by the pilot while holding, VMC conditions were present at a higher altitude (6000 to 8000 ft ASL). The pilot never attempted to climb on top of the cloud layer to regain VMC. An early decision to climb to on-top conditions would likely have decreased the pilot's workload and simplified his decision making considerably. It would have also allowed for clearer, more expedient communications with Toronto Radio, which may have allowed the pilot to obtain detailed weather information regarding the fog and low ceilings throughout the entire area as well as the assistance required to obtain an IFR clearance.

By the time the pilot eventually climbed and contacted Toronto Radio, he was already becoming concerned about his fuel supply. When he realized that the weather in the surrounding area was poor, he decided that he had to make a landing attempt at Bancroft aerodrome by conducting an IMC cloud-breaking procedure. When he broke out of the clouds, the low ceiling and limited visibility prevented him from conducting a successful visual approach.

While the pilot held a valid instrument rating, he had very little experience in an IFR environment and was not prepared for in-flight weather conditions that would force him to fly in IMC and change from a VFR flight plan to an IFR flight plan. The pilot's lack of familiarity in an IFR environment, coupled with his expectation that the low cloud at Bancroft would dissipate as quickly as it had formed, heavily influenced his decision to hold in the vicinity of Bancroft.

The TSB determined that the pilot crashed as a result of his attempt to do a cloud-breaking procedure using a local broadcast radio station for navigation and to descend below safe altitude in IMC conditions to set up for a visual approach. Contributing to the occurrence were the fact that the pilot did not use all the available weather information, his lack of preparation for a rapidly deteriorating weather situation, and his inappropriate decision making. △

Published VFR Routes and Reporting Points

by the Airport and Terminal Operational Procedures Division, Air Traffic Services, NAV CANADA

Have you ever stopped at a busy service station in a new city to ask for directions only to have the local gas jockey tell you to turn left at "Joe's"? Without knowing where or what "Joe's" is, you are probably going to stay lost, aren't you? This helpless feeling has been felt by most of us when we get directions that we don't understand or can't follow.

ATC MANOPS stipulates that controllers must know the distance and direction of each prominent landmark that may be used as a visual reporting point within a 25-NM radius of the airport. Controllers use these landmarks effectively to plan the traffic flow in and out of their airports, and managers ensure that the routes between these landmarks are published if controllers use these landmarks often.

On a busy day, there are occasions when a controller must issue a different route to a pilot—a route that is not displayed on any chart or, worse, a route with no familiar or recognizable landmark. If the pilot is unfamiliar with the area and is unable to ask for clarification because of frequency congestion, where does he fly his aircraft?

Experienced VFR pilots will normally prepare their flight into an airport by studying the airport layout and by referring to the VFR supplement or VFR charts. They normally know where and when to call for initial landing information and are most likely prepared to accept the published inbound route. If a controller-requested routing doesn't match a pilot's plan, he could get that same helpless feeling and might not respond the way the controller wants.

A good technique in airport control is the continuous use by air traffic controllers of the same phraseology for the same type of operation. This holds true for arrival and departure routes. These published routes are familiar to pilots and are expected by them. In fact, they provide for "a safe, orderly and expeditious flow of airport traffic."

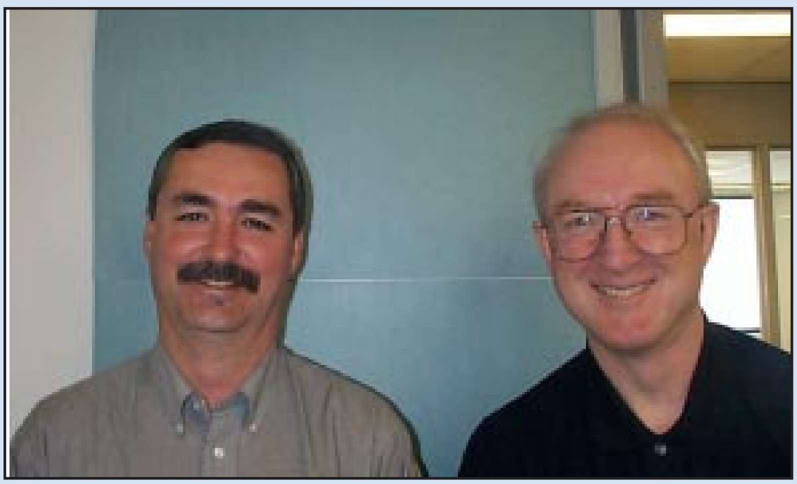
Good work habits by controllers also include continuous use of standardized procedures.

Assigning the standard inbound and outbound routes to pilots can actually make the flow easier to manage. If the published routes cannot be used, the controller should ensure the pilot clearly understands where he or she is to direct the aircraft. Similarly, pilots should refer to a local geographic point only if it is published on a VFR chart or in the CFS.

Unusual reporting points may be very familiar to some, but it may not be to the person you are talking to. If in doubt, ask.

Editorial Note: The preceding article was originally written for an ATC audience, and has been slightly edited so it applies also to pilots. It is published to address the SATOPs (Safety of Air Taxi Operations) Task Force recommendations 18 and 19, which asked that TC publish an the article to remind pilots, when making a position report, to refer to a local geographic point only if it is published on a VFR chart or in the CFS, and that NAV CANADA publish an article reminding controllers that they should not request a pilot to report over a local geographic point unless it is published on a VFR chart or in the CFS. —Ed.

Know Your RASOs—Neil Hughes and Steve Bailey, Pacific Region



Neil Hughes (left) and Steve Bailey.

Neil Hughes' career in aviation started in Calgary as an apprentice aircraft maintenance engineer (AME). He earned his commercial pilot licence in 1979 and worked as a pilot and apprentice engineer in Inuvik and Norman Wells, N.W.T., for three years. After graduating from the Pacific Vocational Institute (now BCIT) in 1984, he attained his AME licence. Since then he has worked on transport category aircraft for Northwest Territorial Airways and Air B.C. In 1996, after eight years (four in Quality Assurance) with Air B.C., Neil joined Transport Canada as a safety inspector with Maintenance and Manufacturing. In August 2000, he assumed duties as a regional aviation safety officer with System Safety to promote, develop and encourage aviation safety.

Steve Bailey grew up on Royal Canadian Air Force training bases throughout southern Ontario before moving back to his native B.C. He started flying gliders in Hope, B.C., in 1965 and received his private pilot licence through an Air Cadet Scholarship in 1967. He earned a commercial pilot licence and an AME licence in 1972. As an AME, Steve progressed from line mechanic to chief engineer to director of maintenance for several companies in Alberta and B.C. before becoming a factory service representative for a large general aviation aircraft manufacturer. As a pilot he has flown piston and turbine charter and scheduled operations primarily in western and northern Canada. Meanwhile he acquired an undergraduate degree in Transportation Economics, an MBA in Marketing and Finance, and he held a position as a full-time lecturer in Corporate Finance at the University of Manitoba. Most recently, Steve owned and operated a flying school and corporate flight company, operating piston and turbine aircraft in western Canada and the Pacific Northwest. Steve joined Transport Canada in June 1999 with General Aviation, and moved to System Safety as a regional aviation safety officer in February 2001.

Both Neil and Steve look forward to working with all segments of our industry. You are encouraged to voice your safety concerns or comments to Neil or Steve in Richmond, B.C., at (604) 666-9517.

Upcoming Regional Events.

The following schedule for upcoming workshops is tentative. Please contact your regional office for exact location and cost.

Crew Resource Management (CRM). This workshop deals with the effective management of all available resources—people, machinery, time and information—to optimize crew decision making, teamwork and actions in order achieve safe, efficient flight. This workshop promotes awareness of factors affecting crew decision making and demonstrates how actions and skills, as well as environmental and human factors, may contribute to or hinder the process. This workshop covers topics identified in paragraph 725.124(39)(*a*) of the *Commercial Air Service Standards*.

Company Aviation Safety Officer (CASO). This workshop introduces aviation safety management principles to participants. It provides both theoretical and practical applications of topics such as flight safety philosophy, human factors, risk management and the decision-making process. The workshop also addresses the role of the flight safety officer as advisor to senior management; the principles and practices of accident prevention; accident/incident management; and incident investigation. This workshop covers the topics identified in subsection 725.07(3) of the *Commercial Air Service Standards*. System Safety offers one free seat to each CEO, Operations Manager, Chief Pilot, Chief of Maintenance or Chief Flight Attendant for every company employee that attends.

Pilot Decision Making (PDM). This workshop, intended for (but not restricted to) pilots in VFR operations in uncontrolled airspace, introduces participants to the decision-making process. The workshop examines human performance factors, including both the influence and limitations of physical, psychological and physiological phenomena and their consequences. The workshop also provides participants with practical exercises to demonstrate good airmanship and illustrate countermeasures to contain or mitigate human error. This workshop covers the topics identified in Section 723.28 of the *Commercial Air Service Standard* VFR Flight *Minimum Visibility—Uncontrolled Airspace.*

Human Performance in Aircraft Maintenance (HPIAM). This workshop promotes awareness of human performance issues for aviation maintenance personnel. Through case studies, participants investigate how errors happened, determine contributing factors that interfered with performance at the critical moment, and develop "safety net strategies" to prevent future errors from occurring. The workshop also examines the importance of error management, including prevention and containment.

Atlantic Region

CASO	October 25–26	Dartmouth, Nova Scotia		
PDM	October 20	St. John, New Brunswick		
HPIAM	September 18–19	St. John, New Brunswick	November 20–21	Goose Bay, Labrador

Workshops are available on demand. For information or to register, please contact Rosemary Landry at (506) 851-7110 or send an e-mail to <landryr@tc.gc.ca>.

Quebec Region

Skills Review Seminar	September 19	Louiseville
CASO	November 6–7	Montreal
PDM	November 21	Montreal (Helicopter PDM)
HPIAM	October 16–17	Quebec City

All Quebec events are in French unless specified. For information or to register, please call (514) 633-3249 or send an e-mail to <qcsecursys@tc.gc.ca>.

Ontario Region

CRM	September 5–6	Toronto	October 24–25	London	November 14–15	Ottawa
CASO	July 24–25	Windsor	October 2–3	Toronto	October 30–31	Timmins
HPIAM	August 15–16	Belleville	September 11–12	Hamilton (Canadian Warplane Heritage)		
	October 17–18	Toronto	November 7–8	Thunder Bay		

For information or to register, please call (416) 952-0175, fax (416) 952-0179 or send an e-mail to <neln@tc.gc.ca>.

Prairie & Northern Region (PNR)

HPIAM	July 11–12	Regina, Saskatchewan
	August 22–23	Calgary, Alberta
	September 12–13	Winnipeg, Manitoba
	October 17–18	Whitehorse, Yukon

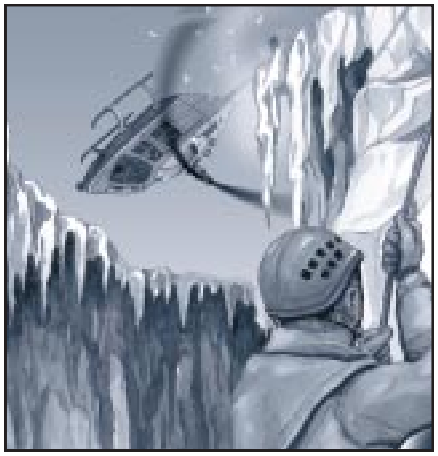
For information or to register, please contact Carol Beauchamp at (780) 495-2258, fax (780) 495-7355 or send an e-mail to <beaucca@tc.gc.ca>.

Pacific Region

CRM	October 15–16	Richmond		
CASO	October 17–18	Richmond		
PDM	July 19	Abbotsford	July 26	Richmond
HPIAM	September 27–28	Victoria	October 15–16	Richmond
	October 31–Nov. 1	Richmond	November 28–29	Prince Rupert

For information or to register, please contact Lisa Pike at (604) 666-9517, toll-free 1-877-640-2233 or send an e-mail to <pikel@tc.gc.ca>; fax (604) 666-9507.

Helicopter Collides with Glacier



On June 22, 2000, the pilot of a Bell 206L-3 helicopter was conducting filming operations at the Llewellyn Glacier for a television commercial depicting extreme sports. The helicopter, equipped with a nose-mounted camera, was occupied by the pilot, the film director, and two camera operators. The helicopter was flying at a high speed in a crevasse among seracs on the glacier when its main rotor struck a serac. Seracs are castle-like masses into which a glacier is divided at steep points by crossing crevasses. The main rotor broke, and the helicopter careened into the ice wall of a perpendicular crevasse, broke apart, caught fire, and tumbled into the crevasse. The impact forces were not survivable, and the remains of the main fuselage area were not recognizable. Rescue and recovery personnel determined that there were no survivors and that recovery would present a high risk to personnel. There was no recovery. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A00P0107.

The sky was clear, and the wind was light to moderate. The pilot had flown in the area for many years and had experience in many helicopter operations, including operations for the local film industry. He departed Whitehorse, Yukon, at about 0730 on the morning of the occurrence, flew to Atlin, B.C., and from there he flew to the Llewellyn Glacier staging area. Aerial filming began at about 1640. An ice climber was dropped off on a serac by another helicopter and was to be filmed by the nose-mounted camera on the accident helicopter. The film director was seated in the left front seat, with the camera controls in front of him. A few passes were made over the ice climber at a height of about 50 ft. The helicopter then landed, and the camera lens was changed to a wide-angle lens, which allowed the camera to capture the surrounding scenery but required that the helicopter fly close to the terrain and the actor. On a filming fly-pass just before the accident, the ice climber complained that the helicopter was uncomfortably close, about five feet over his head, at a high speed.

The accident fly-pass was intended as a set-up pass for the camera. The helicopter was flying below the serac tops, in the crevasses, at a high speed. The main rotor struck a serac about 100 m away from the serac on which the ice climber was standing. One of the main rotor blades broke, and the helicopter careened into the ice wall of a perpendicular vasse about 50 m from the initial blade impact. The helicopter broke apart explosively, caught fire, and tumbled into the crevasse below.

Within minutes another helicopter arrived at the accident site. It was evident that no one had survived the impact. Investigators surveyed the site from the air. The mark on the serac where the main rotor first made contact was consistent with what would be expected by an advancing main rotor blade level flight at a constant speed or accelerating.

A number of pilots specialize in aerial filming and recognize that pilots can get caught up in the filming and be pressured, or pressure themselves, to operate with little or no room for error. Pilots often become consumed by the work objective when they are conducting aerial work; operating the helicopter can become secondary. As an example, when a pilot is flying in a narrow valley, his or her effective awareness is about 100° on either side of the nose; however, when trying to keep a nose-mounted camera focused on an object in the valley, the pilot's effective awareness is concentrated about 45° on either side of the nose. Aerial filming pilots are often asked to juggle the creative and technical aspects of filming with the creative and technical aspects of flying. They are often asked to do things that are unconventional in flying to achieve certain images. Pilots with knowledge of filming techniques can reduce the risk by flying slowly. When filming from a helicopter, the effect of speed can be created by adjusting camera's filming speed.

Analysis—By focusing on the image in front of him and flying close to the seracs at a high speed, the pilot was likely unable to identify the impeding serac, assess its proximity, and alter the helicopter's course in time to avoid it. Based on the height and angle of the mark left on the serac by the main rotor and the height of the mark left by the helicopter when it collided with the ice wall, which were at relatively the same height, the TSB concluded that the helicopter was in powered flight when its main rotor first hit the serac and that the pilot was operating the helicopter at a height and speed that left no room for error in dimensional judgment. △

to the letter

Niagara Falls Restricted Airspace

Dear Editor,

Each year serious incursions into CYR 518 occur when pilots wish to view the Falls. Often these pilots are unaware of the restrictions, have the incorrect altimeter setting, or simply ignore the restriction, particularly when they cannot reach the required altitude of 3500 ft. Many pilots are unaware that they must obtain the altimeter setting from the Niagara Falls International Airport (IAG) ATIS on 120.8 MHz. Others do not have a current *Canada Flight Supplement* (CFS) or chart to identify the area and procedures to follow. Pilots disregarding the restricted zone place themselves, and others, in a high-risk situation since there is likely to be up to six fixed-wing aircraft and five helicopters conducting sightseeing operations at 3000 ft and below. This is a very busy area and is probably the most controlled airspace in Canada. I feel it is important to adopt an education approach to reduce the incursions. One of the best tools to reach the greatest number of pilots is the *Aviation Safety Letter*, and I would appreciate if you could mention this issue in a short article that could appear in time for the summer sightseeing season.

Tony Easton
President, Niagara Air Tours Ltd.

Couldn't agree more. —Ed.

Mid-air Article Reactions

Dear Editor,

You did a good job of describing and explaining the various issues and concerns in the mid-air collision article that appeared on the cover of *Aviation Safety Letter* issue 2/2001. I am somewhat bothered, however, that the taste left in my mouth after reading the article is that the following point wasn't forcibly made. A pilot flying within the circuit of an uncontrolled aerodrome who knows that other aircraft are also reporting their positions in the circuit on the ATF or MF must be able to keep them in sight if they are reported as being ahead of him/her, and keep them in sight until they have landed. Under VFR, when flying in the see-and-be-seen environment, it is not enough for a pilot to merely form a mental picture of the possible whereabouts of other aircraft in the circuit. Your article states that " . . . neither aircraft had noticed the other." I don't think we should let it go at that and decide that all is normal. I have been flying for over 55 years and even today when flying out of Rockcliffe, I feel comfortable only if I can keep the traffic ahead of me in sight until they are on the runway. Unless we can get all pilots to do this, we can expect more mid-air collisions at uncontrolled aerodromes. In closing, I am curious to know if the language spoken by the pilots was a factor in the occurrence. Thank you.

Bill Peppler
Ottawa, Ontario

Thank you Mr. Peppler. The language was not a factor in this occurrence, as both crews were speaking French. —Ed.

To You it May Be Extra Baggage, But to SAR it's a Life-saver cont. from p. 12

satellites listening for just such bleats. The satellites relay the information to SAR authorities, who then plot an approximate crash position and launch SAR or Civil Air Search and Rescue Association (CASARA) aircraft in that general direction. Once in the neighbourhood, search pilots home in on the ELT's plaintive song just as they would home in on a non-directional beacon. The crashed aircraft may or may not be visible depending on the vegetation, but the SAR crews can get to the site with little wasted motion, increasing the chances that the survivors may remain among the living.

ELTs don't need much help from the pilot because they're designed to function automatically in the event of a crash, but they do need some help. They must be properly installed, carrying them in a seat pocket doesn't count. Your aircraft maintenance engineer (AME) can ensure your ELT is properly installed. Its function switch must be in the armed position, its battery must be within its allotted life span, and it must have been recertified within the past year. And it doesn't hurt to peek at it occasionally to ensure that slimy green ooze isn't seeping from its innards and that it's still hooked to its antenna.

To prevent false alarms, listen out on 121.5 MHz before and after each flight. Almost 90% of ELT alarms are false, which is not unusual for alarm systems, but many false alarms could be averted through a post-flight check on 121.5 MHz. Just because you thought the landing was a greaser doesn't mean that the local seismograph—and your ELT—agree.

ELTs are an effective force-multiplier for the SAR forces, allowing them to cover a large country with very few aircraft. False ELT alarms eat up those resources quite rapidly, but ELTs that sound the alarm after crashes allow SAR to provide prompt rescue for injured survivors. A minimum of TLC will help your ELT summon help if that one-in-a-million confluence of dominos lines up just wrong way for you on a day when you least expect it. At least you can expect SAR. △

Collision with Tower

On April 22, 2001, a Cessna 150 collided with a very high communication tower on Mont-Carmel, near Shawinigan, Que. The flight was conducted under visual flight rules (VFR). Around 9:15, witnesses near the accident scene heard the noise of an aircraft engine, followed by an impact noise. The pilot, alone on board, was killed. The weather conditions cleared up at around 11:00, allowing the rescuers to locate the aircraft, which was embedded in the metallic tower structure at about 950 ft AGL. The collision caused structural damage to the tower, and rescuers were unable to reach the wreckage. Consequently, the aircraft and the pilot were not recovered until a few days later, when the local authorities were forced to destroy the tower.

The aircraft took off from Mascouche airport en route to Lac-à-la-Tortue airport. It would seem that unfavourable meteorological conditions played a role in this accident. It was reported that fog was covering the region and that only the first 300 ft of the tower were visible. The tower was 1085 ft AGL, or 1660 ft ASL. The VFR navigational chart of the area depicted the tower's location, height and altitude, and the four stroboscopic lights were operational. The pilot did not communicate with NAV CANADA before or during the flight, and the aircraft was not seen by the Mirabel or Dorval radars.

Shortly prior to takeoff from Mascouche, a witness near Shawinigan (five statute miles east of the tower) informed the pilot by phone that fog was covering the region and suggested that the pilot cancel the takeoff. The pilot decided to go and see anyway, with the intention of coming back if the weather deteriorated. The pilot held an instrument rating, and there was a global positioning system (GPS) unit on board. The extent to which these two factors played a role in the accident is not known; furthermore, it could not be determined if the pilot was using a VFR map.

Several lessons can be drawn from this accident, particularly concerning pre-flight planning, VFR flight into deteriorating weather, and pilot decision making (PDM). VFR navigation flight requires an exhaustive review of the weather conditions and of the planned route on the appropriate VFR navigation charts. We need to identify all significant obstacles along the route and all the maximum elevation figures (MEF). These are shown in quadrangles bounded by dashed lines of latitude and longitude, and they indicate the highest terrain elevation plus 328 ft (100 m) or the highest known obstruction elevation, whichever is higher. Therefore, current and forecast weather conditions should always allow you to fly in VFR conditions above all the MEFs along your route. Finally, this accident may be an appropriate case study for your next PDM class. △

To You it May Be Extra Baggage, But to SAR it's a Life-saver

by Bob Merrick

Many pilots look upon the emergency locator transmitter (ELT) as a pound or so of extra baggage—a lumpy object along for the ride to conform with some fiddlesome regulation. That's because the odds of their specific aircraft crashing on any specific flight are negligible and the odds of the crash occurring where a search might be required are even less. To an extent, they're right.

But over the years, some aircraft do crash. A few fall in remote areas. Without help from an ELT, Search and Rescue (SAR) must wait for the flight plan, note or itinerary to expire before they learn that distressed aviators are awaiting rescue—however long that takes. When there is no help from the ELT, SAR must go to the last known point, then search along the intended route until they find the downed aircraft and, more importantly, the injured survivors.

These searches can take days or even weeks when there is no ELT to help SAR. During that time, the original survivors can become the late lamented.

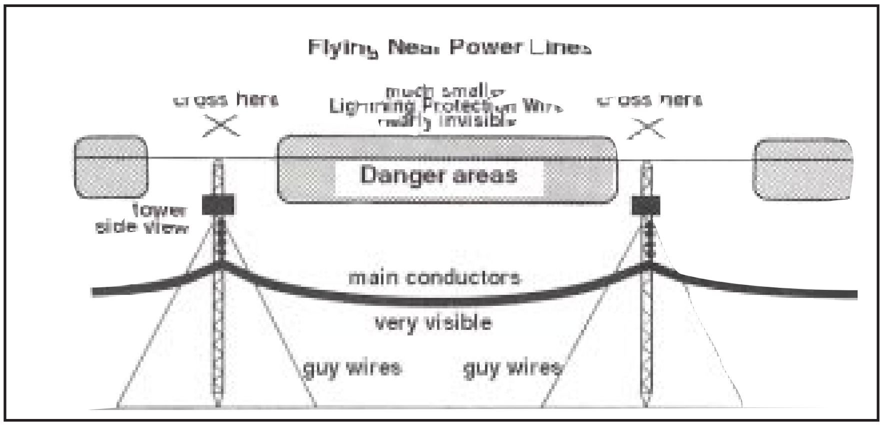
ELTs will not make an aircraft fly any better, nor will they prevent crashes—they're a one-trick pony designed to sense the crash deceleration and send a distress message to COSPAS-SARSAT

cont. on p. 11

TAKE FIVE...

for safety

Five minutes reading could save your life !



Main power lines are easy to see, but when flying in their vicinity you must take the time to look for what is really there and then use safe procedures. Remember, the human eye is limited, so if the background landscape does not provide sufficient contrast then you will <u>not see</u> a wire or cable. Although hydro structures are big and generally quite visible, a hidden danger exists in the wires around them.

The figure shown above emphasizes this point. The main conductor cluster is made up of several heavy wires. These heavy, sagging conductors are about two inches in diameter, and very visible, so they tend to distract one from seeing the guard or lightning protection wires, which are of much smaller diameter.

Guard wires do not sag the way the main conductors do and are difficult to pick out even in good visibility. The only way to be safe is to avoid the span portion of the line and **always cross at a tower**, maintaining a safe altitude, with as much clearance as possible.

- When following power lines, remain on the right-hand side relative to your direction of flight and watch for cross lines and guy cables.
- Expect radio and electrical interference in the vicinity of power lines.
- For operational low flying, do an overflight and map check first.
- Leave yourself an “out”— cross at **45°** to the line.
- Reduce speed in low visibility (for VFR—one mile visibility; clear of cloud; 165 kt max.).

Warning! Intentional low flying is hazardous. Transport Canada advises all pilots that low flying for weather avoidance or operational requirements is a high-risk activity.


CATS CAN SEE IN
THE DARK...
YOU CAN'T
BE AWARE OF THE
HAZARDS OF NIGHT FLYING
Transport Canada
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TP 13717E
(02/2001)
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