Transport Canada Transports Canada

Aviation Safety

Letter

Learn from the mistakes of others; you'll not live long enough to make them all yourself . . . **Issue 1/2005**

Beware of the 180° Turn Back to the Runway...

On September 7, 2002, a float-equipped Cessna 172P aircraft, with an instructor and student on board, departed from Lake St. John near Orillia, Ont. The purpose of the flight was to allow the student to practise takeoffs, landings, and simulated engine failures on departure. During the climb following the second takeoff, the instructor simulated an engine failure by pulling the throttle back to idle. The student executed a 180° degree turn as part of a simulated forced approach back to Lake St. John. During this simulated forced approach the aircraft stalled, pitched nose down and crashed into the swampy area along the shoreline. The aircraft came to rest in an inverted position with its nose embedded in the swamp. Fishermen on the lake were able to rescue both occupants from the partially-submerged aircraft. Neither the instructor nor the student was wearing a shoulder harness, and both received serious injuries. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A02O0287.

The aircraft was equipped and certified in accordance with existing regulations. The instructor pilot held a valid Canadian commercial pilot aeroplane licence and a Class 4 instructor rating. The instructor had accumulated 571 flight hours in powered aircraft, 150 of which were on float-equipped aircraft. The instructor pilot occupied the right seat during the occurrence flight. The student pilot held a valid Canadian student pilot aeroplane permit and was taking *ab initio* pilot training on float-equipped aircraft. The student had accumulated 30.5 flight hours, of which 19.5 were on float-equipped aircraft. The instructor and student had completed two training flights in the week preceding the accident. Circuits and emergencies were the primary focus of these trips. The accident flight was scheduled to allow for further enhancement of these skills and to determine if the student was ready to fly solo.

The instructor conducted an informal pre-flight briefing with the student at the dock and in the aircraft as it was taxiing before the first takeoff. This was common practice at the flight school, and there was no time set aside between bookings for pre- and post-flight briefings. It was assumed by both the instructor and the student that this lesson would be a continuation of the previous day's lesson, which had encompassed takeoffs and landings combined with simulated engine failures. However, all previous simulated engine failures had been introduced at an altitude of at least 1 000 ft above ground level (AGL).

In this instance, the simulated engine failure was introduced during climb out, and the student was not prepared. Directly ahead of the aircraft, the terrain was forested, and the aircraft altitude was not considered sufficient to turn right and land on an adjacent lake, so the student turned back to land on Lake St. John. As the student completed the turn back toward Lake St. John, control of the aircraft was either transferred to the instructor, or the instructor took control. During or subsequent to the transfer of control, the aircraft stalled and descended into the swamp. At no time during the simulated engine failure scenario did either the student or the instructor apply engine power to abort the simulated forced approach.

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In its final report, the TSB said there is insufficient guidance provided in either the Transport Canada (TC) *Flight Instructor Guide*, the TC *Flight Training Manual*, 4th Edition (Revised), or the *Cessna 172 Pilot Operating Handbook* for a pilot to determine the minimum altitude required to safely execute a 180° degree turn following an engine failure after takeoff. Page 128 of the TC *Flight Training Manual* is quoted in the report and says the following:

"Numerous fatal accidents have resulted from attempting to turn back and land on the runway or aerodrome following an engine failure after take-off. As altitude is at a premium, the tendency is to try to hold the nose of the aircraft up during the turn without consideration for the airspeed and load factor. These actions may induce an abrupt spin entry. Experience and careful consideration of the following factors are essential to making a safe decision to execute a return to the aerodrome: 1) altitude 2) the glide ratio of the aircraft 3) the length of the runway 4) wind strength/ground speed 5) experience of the pilot and 6) pilot currency on type."

The *Cessna 172 Pilot Operating Handbook* (Section 3, Engine Failures) states the following:

"In most cases, the landing should be planned straight ahead with only small changes in direction to avoid obstructions. Altitude and airspeed are seldom sufficient to execute a 180-degree gliding turn to the runway."

The TSB further states in its report that although these documents recognize the inherent dangers associated with a 180° degree turn following an engine failure, they do not address the process by which a pilot or a student can determine the minimum safe altitude for an engine-out turn back. The TSB quotes the TC civil aviation document TP 13748E, *An Evaluation of Stall/Spin Accidents in Canada 1999*, which discusses the need for clear and concise information regarding the altitude required before an engine-out 180° degree turn is initiated. TP 13748E states in part:

"Turn Back After Takeoff—Several stalls occurred when the pilot decided to turn back to the runway when 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. This constitutes a "fuzzy rule." That is, the rule requires interpretation, but the rule provides little or no guidance in making that interpretation. How much altitude is enough? Is it always the same? What variables may affect the requirement? The pilot is better off not having to consider these questions. Lives would be saved if the guidance required no thought or assessment. If an engine failure after takeoff results in an accident, the pilot is at least eight times more likely to be killed or seriously injured turning back than landing straight ahead. The easiest decisions to make are those which are prescriptive. As soon as the situation is known to exist, the procedure to follow is defined. Engine failure after take off should be such a decision."

TSB Analysis—The lack of communication between the instructor and student was problematic. The informal pre-flight briefing did not prepare the student for an engine failure shortly after takeoff and, contrary to the recommendations in the *Flight Training Manual,* did not provide full consideration of the factors essential to making a successful turn back.

The student pilot was able to complete the 180° degree turn, which put the aircraft in a downwind approach to the lake; however, the aircraft at that point was both low enough and slow enough that a successful forced landing was not assured, and it was necessary for the instructor to take control of the aircraft. Due to the lack of pre-flight planning for this exercise, the instructor was not prepared for the dangerous situation that had quickly developed and, consequently, tried to salvage the forced landing rather than apply power to execute an effective abort procedure.

TSB findings as to cause and contributing factors

1. The instructor allowed a dangerous situation to develop and continue until the aircraft stalled at an altitude from which recovery was not possible.
2. Neither pilot wore the available shoulder harness, which likely contributed to their degree of injury.

TSB findings as to risk

1. Although the TC *Flight Training Manual*, 4th Edition (Revised), recognizes the inherent dangers associated with a 180° degree turn following an engine failure, it does not provide sufficient guidance for a student or an instructor to determine the minimum safe altitude for a 180° degree turn back to the take-off area in the event of an engine failure or simulated engine failure after takeoff.
2. The training flight was conducted without a detailed formal pre-flight briefing. Therefore, the student was not fully aware of the expected actions following a simulated engine failure at low altitude, increasing the risk that errors could be made.

We agree with the finding related to the immediate factor that led to this occurrence, but we are concerned about the TSB's suggestion that there is a need for specific guidance for a student or an instructor to determine the minimum safe altitude for a 180° degree turn back to the take-off area in the event of an engine failure or simulated engine failure after takeoff.

While the statement itself in the TSB finding is correct, the implication is not. TC is well aware of the risk of attempting to make a turn back to the take-off area after an engine failure at low level and notes that all references in TC flight training manuals and manufacturer's training manuals advise against this technique and recommend landing straight ahead. The regulations also clearly state that the Flight Instructor Guide *and the* Flight Training Manual *must be consulted together to deliver a comprehensive training program. The* Flight Training Manual *provides clear general guidance related to this type of manoeuvre when it*

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states that here are many factors involved in determining a safe altitude for a 180° degree return for landing, and it requires a high degree of skill to attempt such a manoeuvre under what would be considered a high-stress situation. This is an area of training that would be developed progressively over time with a student, taking many factors into account.

It must also be emphasized in the analysis of this and other occurrences that the hazard is not the decision to simulate an engine failure at low altitude, but it is the pilot's attempt to make a 180° degree turn. In this specific case, the instructor pilot allowed the student to commence a turn and delayed taking control of the aircraft. The simulation of an engine failure on takeoff is to test the pilot's decision-making skills and once this is determined, there is no need to attempt or continue a turn at an unsafe altitude. There is no need for a minimum altitude restriction if it is understood that no attempt at a turn under these circumstances is acceptable in a training sequence. Therefore, this accident illustrates more the need for close supervision of the techniques and procedures involved in flying training organizations, rather than establishing arbitrary guidelines for a known unsafe manoeuvre.

Nevertheless, while not mentioned in the TSB Final Report, TC does have additional guidance on this issue. Stall/Spin Awareness—Guidance Notes—Private and Commercial Pilot Training *(TP13747E), details an instructor demonstration, at altitude, of a return to the runway after an engine failure after takeoff. The section "Stall Training" contains the following paragraph:*

*"**Engine Failure after Take-off** (followed by an attempt to return to the runway)*

This demonstration will show the student how much altitude the aeroplane loses when, following an engine failure after take-off, an attempt is made to return to the departure runway. In order to complete the manoeuvre, the aircraft must be turned to a reciprocal heading AND realigned with the runway. This requires much more than just 180 degrees of turn. For novice pilots, turning back is not an option. An evaluation of stall/spin accidents in Canada showed that the pilot is eight times more likely to be killed or seriously injured turning back than landing straight ahead. For expert pilots who know how much altitude is needed to complete the required manoeuvring, it can be an option but even experts should be looking for landing areas that require less manoeuvring and less risk. Perform this demonstration using either a medium or steep bank in the turn, giving emphasis to stall avoidance.

Instructor and Student Practice

At a safe altitude,

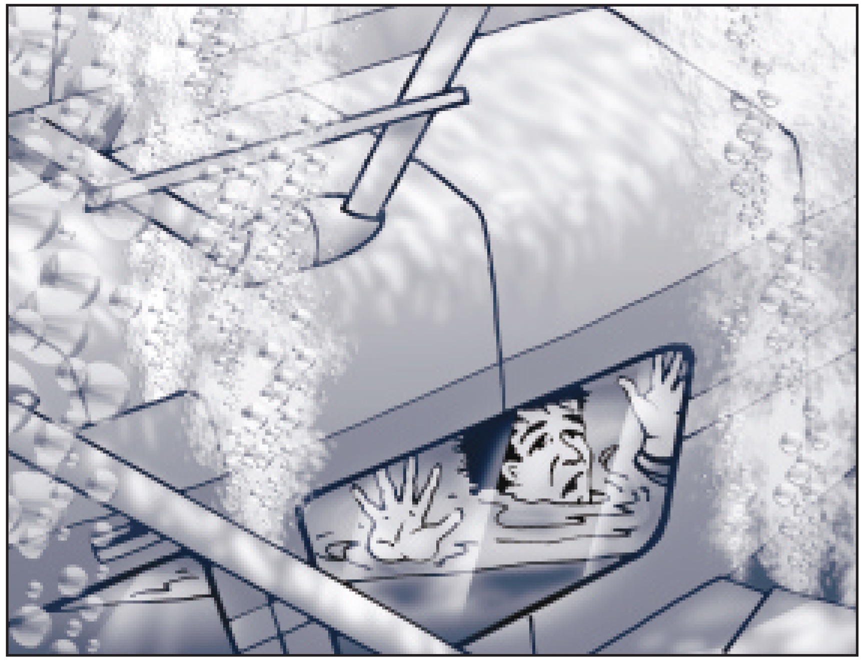
1. *In cruise configuration, establish the best rate of climb speed (V_y). Note your altitude.*
2. *Reduce power smoothly to idle to simulate the engine failure.*
3. *Lower the nose to maintain the best glide speed and make a 270° turn followed by a 90° turn in the opposite direction to roll out on the reciprocal of the original heading.*
4. *Point out the altitude loss and emphasize how rapidly airspeed decreases following a power failure in a climb attitude.*
5. *Demonstrate the manoeuvre again and allow the aeroplane to stall during the turn. (This is actually a variation of an approach stall.) Emphasize the possibility of a spin developing from these types of stalls.*

Note: It should be stressed that the successful return to the airport after an actual engine failure on take-off depends on a variety of factors including available landing surfaces, altitude AGL when failure occurs, weather, turbulence, aircraft type and pilot skill and stress level. Point out that the altitude loss incurred during the controlled demonstration will be significantly less than in a real life situation. It is recommended to conduct the demonstration from the cruise configuration to reduce wear on the engine."

In conclusion, we wish the report had focused more on the human and organizational factors that led to the occurrence, rather than the perceived lack of prescriptive guidance on how to perform a known dangerous manoeuvre. —Ed. △

From The Investigator's Desk: Passenger Briefings and Safety Features Cards in Seaplane Operations

An Aviation Safety Information Letter *from the Transportation Safety Board of Canada (TSB)*



Dramatic visualization of a panic-stricken passenger facing a life-or-death underwater evacuation. True visibility would be much worse than illustrated.

On June 7, 2004, a Cessna A185F seaplane carrying one pilot and three passengers crashed while landing at Ferguson's Cabin on the Taltson River, NWT. The circumstances of the accident indicate that the aircraft dug the left float at touchdown, then dragged the left wing in the water and cartwheeled. The aircraft sustained substantial damage, and came to rest floating inverted with only the bottoms of the floats visible on the surface of the river. The windshield and the left cabin door window broke out at impact, and the cabin immediately filled with water. The pilot and the right front-seat passenger were unable to open either of the main exits after the aircraft submerged, and they egressed through the broken window in the left cabin door. Four fishermen responded to the accident in boats and assisted the survivors, who sustained non-life threatening serious injuries. The two rear-seat passengers sustained no physical injuries during the occurrence; however, they drowned. One victim was found inside the aircraft. The second victim was found two days after the accident, near where the aircraft crashed, in 55 feet of water. The investigation (A04W0114) is ongoing.

All occupants had been restrained with lap-belts, and the impact forces were well within the range of human survivability. Despite having received no immobilizing injuries, the survivors were unable to unlatch and open the cabin doors from the cockpit seats, which delayed their egress from the submerged and inverted aircraft. Post-accident examination determined that the cabin door handles were functional and appropriately placarded; however, impact damage to the airframe may have prevented the doors from opening, even if the door handles had been rotated to the unlocked positions. Egress actions by the victims were not determined, although both had released their seat belts.

The passengers had been provided a standard safety briefing prior to departure. The safety briefing included information on the use of available restraints, the location and use of the life preservers, and the use of the main cabin doors as emergency exits. Information related specifically to underwater egress, such as likelihood of occupants becoming disoriented under water or the expectation that the cabin doors may not open until the fuselage had filled sufficiently with water to equalize the internal/external water pressure, was not provided during the briefing and was not presented on the available safety features card. Because it is probable that impact damage precluded the normal operation of the cabin doors, the extent to which the lack of underwater egress information may have diminished passenger response and egress has not yet been determined.

Transport Canada established the Safety of Air Taxi Operations (SATOPS) Task Force in January of 1996 to address the high accident rate among 703 operations. The resulting report contained 71 recommendations to improve the safety of the Air Taxi sector. The report stated:

"There is a lack of information available to passengers in float-planes and helicopters about underwater egress in the event the aircraft flips over on take-off or landing or ditches and rolls over...".

The report went on to recommend that:

"Float-plane pilots and helicopter pilots operating over water include information on underwater egress procedures in the passenger briefing."

The seaplane was being operated under *Canadian Aviation Regulations* (CARs) 703 at the time of the occurrence. CAR 703.39 requires that passengers be given a pre-flight safety briefing in accordance with the *Commercial Air Service Standards*. Similarly, CAR 602.89 requires passengers on board a private aircraft be provided a passenger briefing before take-off. Neither regulation is instructive with regard to a requirement for the briefing to include information specific to underwater egress procedures in seaplane operations. CAR 703.39 also requires an air operator to provide each passenger, at the passenger's seat or by means of clearly visible placards, with the safety information required by the *Commercial Air Standards*. There is no requirement for seaplane safety feature cards to display information or special procedures unique to underwater egress. Consultation with several operators has determined that it is not a standard practice to include that type of information in a seaplane briefing or on a seaplane safety feature card.

Federal Aviation Administration Advisory Circular AC 91-69A (Seaplane Safety for 14 CFR Part 91 Operators) provides valuable information regarding seaplane passenger briefings and egress under water. Other worthful references include the current edition of the Transport Canada *Instructor Guide, Seaplane Rating* and Transport Canada Publication TP 12365E (*Seaplanes: A Passenger's Guide*). TP 12365E does contain useful information on passenger egress from submerged aircraft. Several seaplane operators were contacted and most were not aware of the existence of the TP12365E pamphlet.

When a seaplane submerges, occupant survivability is predicated on the ability of the occupants to remain mobile and to rapidly get out of the cabin. There are currently hundreds of seaplanes being operated seasonally in Canada, in both private and commercial service, and this and other recent accidents indicate that a high percentage of seaplane occupants continue to survive a water impact only to drown as the consequence of being trapped inside the cabin. The risks associated with seaplane occupants being trapped inside a submerged aircraft are increased when the pre-flight safety briefing and the safety features card do not include information specific to underwater egress. The foregoing is provided for whatever follow-up action is deemed appropriate.

Section 703.39 of the CARs requires air operators to brief passengers seated next to an emergency exit on how that exit operates. This section also requires either a safety features card or a placard at the passenger's seat. These regulatory requirements are deemed appropriate for seaplane operations. Nevertheless, since Transport Canada is moving towards performance-based regulations as part of the safety management system (SMS) implementation, it is our goal to have better training for our inspectors and better awareness for our 703 operators that will address the concerns expressed in the TSB letter.

We have developed several promotional documents in recent years to increase awareness of emergency underwater evacuation procedures, both for passengers and crews. Among those for the passengers was a brochure produced in 1995, entitled Seaplanes—A Passenger's Guide *(TP 12365E). This brochure was widely distributed to floatplane operators through the System Safety regional offices. The challenge was to reach the passengers, and cooperation from the floatplane operators and pilots was, and still is, a must in including this information in their mandatory passenger briefings. The original TP 12365E is currently available as an on-line brochure only from our System Safety Web site. Still, we are in the process of updating it for a wide release, as a paper brochure, prior to the 2005 floatplane season. Floatplane operators and pilots are therefore strongly encouraged to include specific underwater egress instructions as part of their pre-flight safety briefing to passengers, including situational awareness effects.*

However, awareness and education can't do it all. A ***philosophical*** *change is needed in the way that floatplane operators view safety, and hopefully the move to SMS will help achieve this. This not only applies to the issuance of detailed underwater egress instructions, but also to the use of inflatable life vests that meet the TSO C13f standard. Many of those who escaped the aircraft, only to become the victims of drowning, could have survived if they had been wearing an inflatable life vest. Most operators already have the TSO C13f (inflatable) life vests but many pilots and passengers do not wear them. Some argue they scare the passengers, or that some passengers may inflate them prior to exiting, therefore making the egress less likely. I believe that a passenger who has been properly briefed on when and how to inflate a life vest has a better chance of survival than if they elect not to wear it during flight. The regulations do not mandate the wear of these life vests, and are not likely to do so either. There is nothing stopping operators from going beyond the safety margins offered by the regulations. Most offshore helicopter operators mandate that all on board wear them. This is an example of philosophical difference and one that improves survivability. —Ed.* △

Flight Data Monitoring—A Proactive Approach to Safety

by Howard Posluns, Transportation Development Centre, Transport Canada

Using recorded flight data to prevent accidents

While flight data recorders—such as the so-called black boxes—are regularly called on to help determine the cause of airplane accidents, the information they routinely collect can also help prevent accidents.

Flight data recording devices electronically monitor and record data from a wide variety of systems aboard an aircraft from engine start-up to engine shutdown following a flight. Analyzing the data from several flights by the same aircraft, or by the same type of aircraft, can reveal potential technical or safety problems long before they become critical. The data can also be used to improve maintenance schedules, flight crew performance and air traffic control procedures. Confidentiality is an important issue as well, so Transport Canada is changing the *Aeronautics Act* to ensure that the recorded flight data is properly protected.

Cost-effective and safe

Flight data monitoring programs (FDMP) are widely recognized in the aviation industry as one of the most cost-effective tools for improving safety. Begun in Europe several years ago, they are now widely used in many parts of the world. In the U.S., where the program is called Flight Operational Quality Assurance (FOQA), most carriers have had programs for several years.

Transport Canada is working with Canadian airlines interested in starting voluntary monitoring programs, and most of the larger companies either have a program in place, or are in the process of implementing one. While some airlines conduct the entire monitoring program in-house, others use a third-party company to analyze the flight data. Negotiations are currently underway with other Canadian carriers to start FDMPs. The department also organizes seminars, meetings, and other opportunities to exchange information and to stay on top of developments within the industry and around the world. A recent meeting in Ottawa gave airlines considering an FDMP a chance to talk with those who already have one. They also heard representatives from the U.S., U.K. and Japanese civil aviation authorities, as well as Japan Airlines.

Learning from experience

Transport Canada's Transportation Development Centre (TDC) has been involved in the development of a variety of technologies used in FDMPs. For example, the international flight recorder configuration standard (FRCS) was developed to standardize the information that a flight data recorder ground station needs to recover, decode and interpret the hundreds or even thousands of parameters that a flight recorder captures electronically. This standard has been adopted by ARINC for industry-wide use.

TDC has also been active in the area of data and information sharing. Airlines from around the world are now starting to share data and safety information in an international effort to improve safety and efficiency by learning through the experiences of others. As this type of cooperative activity expands, it is expected that an already enviable safety record will be improved even more.

Transport Canada is currently encouraging Canadian air operators to implement a safety management system (SMS), and this activity will be regulated over the next few years. The SMS sets out systematic and comprehensive processes for managing safety risks, and integrates operations and technical systems with financial and human resource management to achieve safe and efficient operations. Where applicable, FDMPs will be considered an essential component of an airline's SMS.

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Recreational Aviation

Serge Beauchamp, Section Editor

Brakes: What's Stopping You?

by Rob Laporte, Civil Aviation Safety Inspector, System Safety, Ontario Region

Have you ever taken a moment to stop and think about what's stopping you? Whether the aircraft is an Airbus A-340 or an amateur-built aircraft, brakes are relied on for ground manoeuvring, parking and stopping the aircraft after-landing or an aborted take-off attempt.

Brakes work by applying a friction force to the main wheel assemblies to slow and stop the wheels' rotation. This friction absorbs the aircraft's kinetic energy (KE) and converts it into thermal energy. Aircraft brakes must have a minimum energy rating equivalent to the KE generated by the aircraft at its maximum landing weight and speed.

In large airplanes, the thermal energy potential is so great that the wheels are manufactured with thermal relief plugs that melt in an over temperature occurrence to deflate the tire, preventing the tire from bursting due to over pressurization. Many large airplane types have temperature sensors on the wheels to monitor wheel temperature, and some even have cooling fans to cool the brakes on the ground. Pilots and constructors of amateur-built aircraft are not required to be as cognisant of the hazards related to brake thermal energy, as are their large airplane counterparts. Yet, even on a light or very light aircraft, the brake thermal energy can be significant and should be considered. A light aircraft weighing 1 100 lbs (500 kg) and touching down at 60 kt has a KE equivalent to the amount of heat energy required to bring 2 cans of light beer to a boil on a 15°C day at sea level.

When constructing amateur built aircraft, *Canadian Aviation Regulations* (CARs) Subchapter A, 549.7 states: "Materials shall be appropriate and should conform to aviation quality specifications." Brake line assemblies in certified light aircraft use: Aluminium alloy 5052 tubing; rubber hose that meets Mil-H-8794 specification with an operating range of -54°C to 121°C; or, stainless steel braided Teflon hose meeting Mil-H-25579 specification with an operating range of -54°C to 232°C.

Are your brake lines up to the thermal challenge? Nylon tubing with a recommended operating range of -51°C to 100°C, are frequently used in amateur-built aircraft braking systems. This tubing is used because it is lightweight, flexible, inexpensive, able to withstand brake system pressure, and is compatible with Mil-5606 hydraulic fluid.

There is a significant hazard when brake lines fabricated from nylon tubing are attached directly to a wheel brake assembly. Heavy or repetitive brake applications can cause the temperature at the brake assembly and the brake line interface to exceed the temperature rating of the nylon tubing, resulting in brake line failure. In addition, nylon tubing loses some of its properties and becomes brittle when exposed to ultraviolet light from direct sunlight. The risks associated with brake line failure include brake failure and/or brake fire when the brake fluid, usually Mil-5606, is pumped onto the hot brake assembly and ignites.

The following case study is a factual account of a brake line failure resulting in a brake fire. The cause is attributed to brake temperatures exceeding the thermal capability of the nylon brake line. It is probable that the fire would not have occurred had the brake lines been manufactured with material conforming to aviation quality specifications.

In September 2003, a pilot took delivery of a recently purchased Van's RV-3. The RV-3 is a single-seat amateur-built aircraft with a maximum take-off weight of 1 151 lbs (522 kg), and was built by the previous owner. The pilot had significant flying experience in light airplanes and had elected to assess the aircraft's handling characteristics in a series of high-speed taxi runs. The pilot requested a runway from the control tower and was assigned a 5 300-ft runway for the taxi runs. During a taxi run, the control tower reported to the pilot that flames were visible, emanating from the right main wheel. The pilot then reported "no break pressure on the right wheel," and exited the runway, parking the aircraft on the grass. After the aircraft stopped, the pilot exited the aircraft and discharged the aircraft's fire extinguisher on the right wheel, extinguishing the fire. The fire destroyed the right wheel fairing (pant), tire, and wheel assembly.

The fire was probably caused when the brake assembly temperatures exceeded the operating temperature of the nylon brake line, which caused the brake line to burst. When the nylon brake line burst, hydraulic fluid (Mil-5606) was sprayed on to the hot brake assembly and ignited. Though the damage was restricted to the wheel areas, the owner felt that had he not been able to extinguish the wheel fire, the aircraft would have been destroyed. To mitigate the risk of brake line failure the pilot-owner has replaced the nylon tubing with steel brake line at the interface between the brake assembly and brake line.

COPA Corner—Ultralights and Passengers

by Adam Hunt, Canadian Owners and Pilots Association (COPA)

The year 2003 was not the best for passengers in ultralight aircraft in Canada—several were injured or killed. The worse part was that many of these passengers were not permitted to be flying in the ultralight in the first place. In one case, a passenger was severely injured while flying with a pilot who held a Pilot Permit—Ultralight, which was restricted "no passengers." In another case, a pilot and passenger were killed when their advanced ultralight crashed due to a non-factory-authorised modification, which rendered the carrying of passengers illegal.

As ultralight fliers, if we want to be able to continue to have the privilege of carrying another person with us, we have to know when that is allowed, and stick to the rules. If we don't, then we may find the rules changed. So when can you carry another person in an ultralight? The answer depends on the class of ultralight in question.

Basic ultralights can only have two people on board under two circumstances. The first is when one occupant is an instructor and the other one is a student and they are conducting a flying lesson. The second instance is when both are pilots who have privileges to fly an ultralight airplane. That means that both have to hold one of: Pilot Permit—Ultralight, Pilot Permit—Recreational, Private Pilot Licence—Aeroplanes, Commercial Pilot Licence—Aeroplanes or an Airline Transport Pilot Licence—Aeroplanes. Holders of licences for helicopters, balloons, gyroplanes, etc., do not qualify! If the passenger you want to carry doesn't fit either one of those circumstances, then they can't fly in a basic ultralight.

For advanced ultralight aircraft, two requirements have to be met—the aircraft and the pilot have to be qualified to carry a passenger. If the aircraft is registered as an advanced ultralight, then it can be used to carry a passenger only if it is maintained in accordance with the manufacturer-specified maintenance program; the owner of the advanced ultralight aeroplane has complied with any mandatory actions specified by the manufacturer; the advanced ultralight aeroplane has not been modified without written approval from the manufacturer; and a placard is installed in a location highly visible to the both occupants that says: "This aircraft is an advanced ultralight aeroplane and is operating without a certificate of airworthiness."

The pilot also has to have a licence that allows them to carry passengers. Currently, that means a Pilot Permit—Recreational or higher licence. At some point in the near future, it will be possible to fly a passenger in an advanced ultralight with a Pilot Permit—Ultralight; with the proposed passenger carrying endorsement, but that is not available yet.

As ultralighters, if we want to be able to continue to carry passengers, we have to make sure that we only carry passengers when it is legal to do so. Carrying illegal passengers has the potential to hurt everyone who values ultralight flying. More information about COPA can be found at www.copanational.org.

Accidents Reports

The object of this column is to inform recreational aircraft owners and pilots of incidents and accidents that have occurred in recent months in Canada. This information is published in order that pilots may recognize conduct and types of operations leading to risks, and too often, to a loss of life.

Fuel estimate "slightly" off—A Piper PA-28 departed on a visual flight rules (VFR) flight with a planned time en route of 3 hr 20 min and an estimated 5 hr of fuel on board. Two hours into the flight, the pilot became aware that his fuel quantity was less than anticipated and there was no diversion airport available. The engine failed due to fuel exhaustion after 3 hr 10 min total flight time, 5 NM short of destination. The aircraft was force-landed on a small lake. *Tip: Review* Canadian Aviation Regulation *(CAR) 602.88.*

Balloon forced into wires by wind shift—A balloon, Lindstrand Model LBL 310 A, was on approach to a field when a wind shift caused the balloon to descend rapidly toward power lines. The pilot lit the burners and attempted to clear the power lines but was unsuccessful. The balloon envelope made contact and knocked down several power lines. The pilot managed to get the balloon free and flew on to make a successful landing 2 mi. further. Two passengers suffered minor injuries during the impact with the power lines and the balloon sustained minor damage.

Hard landing on glassy water—On completion of a local flight at Churchill Lake, Ont., the Aeronca 7AC aircraft landed hard on glassy water. The float boxing wires on the right side of the aircraft failed and allowed the right wing tip to contact the water. Neither the pilot nor the passenger was injured.

Wire strike—The pilot of an amateur-built on floats was on approach for a water landing on a river near Alma, Que. He collided with one of the guard wires extending above a heavy wire cluster running from one tower to the other. The aircraft crashed into the river, but the pilot and the two passengers were successfully rescued. All the wires of the high capacity electrical power line were marked, except for the upper guard wire that was located about 15 ft above the main cluster. The guard wires, also called lightning protection wires, are of a smaller diameter than the main wires, making it hard for pilots to distinguish them from the surrounding background.

Gyroplane no match for downdraft—A RAF 2000 amateur-built gyroplane had departed from Runway 03 at the Medicine Hat, Alta., airport on a local pleasure flight. Following a normal climb to approximately 250 ft above ground level (AGL), the gyroplane began to lose altitude. The pilot confirmed that the airspeed, engine RPM and rotor RPM indications were normal for a climb configuration. However, the gyroplane continued to descend and a forced landing was performed on 10th Avenue, in the southwest corner of the city. There was no damage to the gyroplane and the pilot and passenger were not injured. The wind and terrain conditions were such that the gyroplane may have entered the downdraft side of a wave of air flowing over the south bank of the river valley, which exceeded the climb capability of the aircraft. A combination of temperature and pressure altitude, all-up weight and strong downward moving air mass likely created a situation where the aircraft capabilities were exceeded.

Pilot removes shoulder and lap restraints just before impact—The amateur-built Glastar aircraft was taking off from Six Mile Lake, Ont., on a VFR flight to Lake Rosseau/Cameron Bay, Ont. The aircraft encountered a windshear and stalled with a right wing drop shortly after takeoff. The aircraft struck the water in a nose-down attitude from about 50 ft. The pilot sustained serious head injuries when he was thrown through the windshield on impact. He had been wearing both shoulder and lap restraints, but had removed them before contact with the water to facilitate egress. *Lap and shoulder restraints will only perform their function as designed if you use them. —Ed.*

High-speed taxi test goes wrong—The pilot-owner of a CIRCA Reproductions Nieuport 11 ultralight was doing a high speed taxi test on Runway 34 at the Nanaimo, B.C., airport, when the aircraft became airborne and crashed just east of the runway at mid-field. The pilot sustained fatal injury. *High speed taxiing has its risks. Be aware of them. —Ed.*

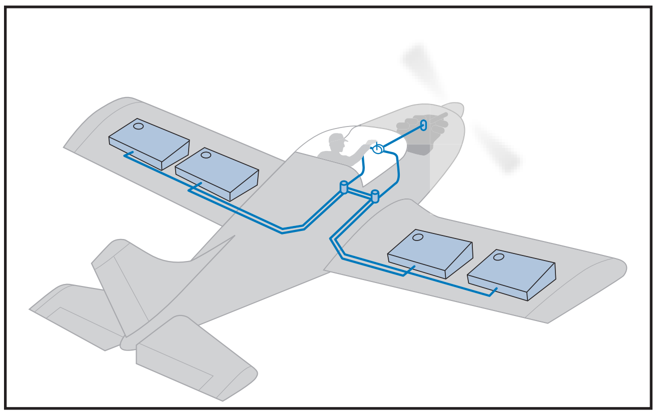
Fuel Systems Modifications: Think Twice

Your lifeline to a safe flight rests, among other things, on the proper management of your aircraft fuel system. Without an ample fuel supply available, your flight will not last very long! Countless accidents occur annually because pilots fail to ensure an adequate supply of fuel to the engine or because of the use of poor quality fuel.

Who's at fault? One doesn't have to look very far for the answer, but inevitably, lives are lost, damages are incurred and the pilot community suffers considerably for the amateurish way some pilots view their responsibilities.

The number of aircraft owners who choose to modify their aircraft fuel system without due care or consideration for established practices is scary. A very famous folk and country music singer, John Denver, died because a modification was made to the fuel selector of the aircraft that he had purchased several weeks before. As he was flying at low altitude over the Pacific coast, one of his fuel tanks ran dry and it is believed that, as he pivoted to try and reach the fuel selector located aft of his right-hand shoulder, he exerted pressure on the left rudder and the aircraft dove into the sea.

Modifications to fuel supply systems are not restricted to fuel selectors, as fuel tank location, size, fuel line diameters and pattern, material and connections, all take their toll on aircraft mishaps. Aircraft manufacturers, and this includes kit manufacturers too, spend countless hours designing, testing, and compiling data on their fuel system to ensure the best design possible under the conditions chosen for the type of aircraft and engine configuration. When aircraft owners choose to modify it without consulting the proper authorities and experts (e.g. the aircraft manufacturer, a Transport Canada qualified design engineering representative (DER),



or someone else who is qualified), they are very likely risking the lives of whomever is going to fly in their aircraft. Some aircraft owners modify the fuel lines improperly, in a way that any water present in the fuel can accumulate at various points in the lines. Others install drains and filters that do not allow for the removal of all of the water that may be present and may cause an engine failure at the most critical moment of flight, the takeoff. Some add a collector or header tank but do not add draining capabilities at the lowest point in the reservoir. Water then collects in sufficient amounts and can clog the fuel filter entirely while in flight.

In short, if you are allowed to do your own maintenance (according to the category of aircraft you own), and you consider making modifications to your aircraft fuel system, it is highly recommended that you seek professional advice, as this consists in a major modification, which can greatly affect the safety of flight. If in doubt, consult with your regional Transport Canada inspectors; they will be glad to provide guidance.

To Drink or Not to Drink

by Michel Treskin, Civil Aviation Safety Inspector, System Safety, Ontario Region

He looked at the approach and it all seemed right. He had done it so many times that he could have closed his eyes and still made it look easy. The wind was just starting to increase as the sun peeked over the horizon. His nine passengers were mesmerized by the silence and by the gigantic balloon hanging right over them. The noise generated by the twin burner, which had been switched on without warning, was deafening. The field had been selected from previous flights and all seemed to be normal that day.

As the balloon descended towards the landing area, the pilot saw that there was a slight chance that his approach would bring the balloon dangerously close to some secondary power lines. He decided to continue to see if he could salvage the landing and still stop and deflate the envelope before contacting the power lines. He knew it would be a close call but *he* also knew that *he* was a damn good pilot and that *he* had experienced some close calls in the past.

The basket hit the ground and started to tip over. He instinctively applied full burner to try to recover from tipping the basket. The surge of hot air filled the envelope and the gigantic balloon started to recover and get back into a gentle ascent. During this aggressive recovery, flames made contact with the skirt of the envelope and were seen by the local residents living in the surrounding area. Some resident were so surprised by the early morning sight and sound of the event unfolding in front of their eyes, that they called the local law enforcement to report a balloon on fire in their backyard. In the spur of the excitement, the pilot forgot about the wires that were right on the path of his ascent. The wires made contact with the basket and broke. The balloon traveled another 10 mi. before finally landing safely in a secondary field with only minor damages. During this transition time, the local police maintained a visual contact and were able to meet and confront the pilot.

The first thing they noticed when they questioned him was the smell of alcohol on his breath. Yes, the pilot had been drinking the previous night. He said that his last drink was well before 8 hr prior to his morning flight and that he would gladly submit to a Breathalyzer. Unfortunately for the pilot, he failed the test. Note: A "FAIL" report from the "road side" screening test equipment indicates the presence of alcohol between 0.049% and 0.099%.

The above flight actually happened and many pilots in Canada may have misconceptions about *Canadian Aviation Regulation* (CAR) 602.03, the rule that addresses the consumption of alcohol. Here it is:

602.03 No person shall act as a crew member of an aircraft

(a) within eight hours after consuming an alcoholic beverage;

(b) while under the influence of alcohol; or

(c) while using any drug that impairs the person's faculties to the extent that the safety of the aircraft or of the persons on board the aircraft is endangered in any way.

We often refer to this as the "8 hours from bottle to throttle" rule, but if we look at it closely, we see that it is a three-part regulation. What some may be overlooking is the second part that states, "No person shall act as a **crew member** of an aircraft (b) <u>while under the influence of alcohol</u>." Transport Canada has no tolerance on this rule if you are found with any trace of alcohol in your system. The regulation can actually be misleading; one rule states that you are allowed to drink eight hours before a flight, while the other says you better not get caught with any trace of alcohol in your system even if it has been eight hours since your last drink.

We are all different when it comes to the time required for our body to eliminate all traces of alcohol. For some, eight hours may be long enough, while others might need more time. The amount of liquor consumed is a big factor as well. A single beer consumed eight hours or more before a flight will not yield the same hangover as multiple servings of beer, wine or liquor. What we need to remember is that if we decide to have an alcoholic beverage the night before a flight, we must ensure that we are completely clean before we start that flight. Otherwise, we might find ourselves without a licence.

Editorial Note

It is with mixed feelings that we must announce the departure of our friend and colleague, Mr. Serge Beauchamp, editor of *Aviation Safety Maintainer*, as well as our section editor for the "Recreational Aviation" section of the *Aviation Safety Letter*. Thank you Serge for sharing your deep aeronautical knowledge, vast and varied experience, and passion for aviation safety with the newsletters readership for the past three years—you have made a difference for many. No doubt you will continue to do so, as we know aviation is, and will remain, an integral part of your life. Blue skies and fair winds Serge! —*The entire System Safety staff*

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. *—Ed.*

TSB Final Report A02Q0119—Engine Failure and Loss of Control

On September 2, 2002, a Mooney M20E was to make a flight according to visual flight rules (VFR) from Québec City to Rimouski, Que. The aircraft took off from Runway 30 at 13:46 Eastern Daylight Time (EDT), with the pilot, a flight instructor, and a passenger on board. As the aircraft was climbing through 600 ft above sea level (ASL), the control tower received a radio message from the aircraft, indicating that the engine had failed and an emergency landing would be made. The aircraft was observed in a steep right turn before nosing down and crashing near a baseball field, less than 1 NM north of the end of Runway 30. The aircraft was destroyed on impact but did not catch fire. The three occupants were fatally injured.

Findings as to causes and contributing factors

1. The pilot flying did not maintain the minimum flying speed after the engine stopped. The aircraft stalled at an altitude insufficient to allow the pilot to effect recovery.
2. The engine stopped when the aircraft was at low altitude, allowing little time for the pilot flying to select a suitable landing area, place the aircraft at the gliding flight speed, and complete the emergency checklist.
3. After the engine stopped, the pilot flying made a steep turn, thereby increasing the stall speed.
4. The reason for the engine's failure was not determined.

Findings as to risk

1. The pilot instructor did not know the flight characteristics of the aircraft any better than the pilot he was training. However, regulations permitted him to give flight instruction on aircraft types with which he was not familiar.
2. The emergency locator transmitter (ELT) did not activate on impact, which might have had negative consequences if the aircraft had crashed in an uninhabited area.

Other findings

The fuel selector on Mooney M20 models A to G can be hard to reach without interfering with the flight controls, thereby adversely affecting the pilot's ability to control the aircraft.

TSB Final Report A03P0133—Controlled Flight Into Terrain (CFIT)

On May 31, 2003, a Cessna 182 took off from a private airstrip near Chilliwack, B.C., with the pilot and four skydivers on board at approximately 18:40 Pacific Daylight Time (PDT). Two skydivers were released at 3 000 ft and two at 9 000 ft. The aircraft failed to return to the strip. No ELT signal was received. The Rescue Coordination Centre (RCC) at Victoria, B.C., was notified and a search was initiated. The aircraft was found six days later on a northwest-facing slope of the Skagit mountain range, 4 NM from the private airstrip, at an altitude of about 4 600 ft ASL. A fire had broken out on impact and consumed much of the cockpit area and left wing. The aircraft was destroyed. The pilot was fatally injured.

Findings as to causes and contributing factors

The pilot most likely entered cloud inadvertently and continued to descend in the expectation of breaking out of cloud, but flew into high terrain.

Findings as to risk

The armed ELT did not operate because of impact damage, hampering the search and rescue (SAR) operation.

TSB Final Report A03O0135—Loss of Control on Water

On June 5, 2003, a de Havilland DHC-6-300 amphibious aircraft with a single pilot on board was performing firefighting operations in the vicinity of Lake Wicksteed, approximately 10 NM north of Hornepayne, Ont. The aircraft was scooping water from Lake Wicksteed for the nearby fire. The lake is approximately 7 300 ft in length, with gentle rising terrain along its shoreline. This was the third scooping from the lake, and the approach was flown in an easterly direction in light wind conditions. The pilot performed the inbound checks, lowered the water probes to begin filling the float water tanks, and touched down on the lake. Within a short time, he observed water spraying from the overflow vents located on top of the floats, indicating that the tanks were filled to capacity. He pressed a button on the yoke to retract the probes, and the aircraft immediately nosed over into the lake in a wings-level attitude and began to sink. The accident occurred at approximately 18:00 EDT. The pilot extricated himself from the aircraft and held on to the side of the partially submerged aircraft. A witness to the occurrence immediately boarded a powered aluminium boat and went to assist the pilot, while a second witness travelled to Hornepayne to notify the authorities and emergency services. Once the pilot reached the shore, he was taken to a nearby cottage where he remained until emergency services arrived. The aircraft came to rest on the bottom of the shallow lake, in an inverted attitude, with the floats above the surface of the water.

Findings as to causes and contributing factors

1. The operator's DHC-6 standard operating procedures (SOP) were not followed, and the vital action checklist was not fully completed during the approach. As a result, the bomb door armed switch on the centre panel was not selected OFF after the previous water bombing run, and prior to the scooping operation.
2. After completing the water scooping operation, the pilot unintentionally selected the bomb door push button switch instead of the adjacent probe switch. Because the bomb door armed switch on the centre panel was left ON, the bomb doors extended into the water. Drag from the doors and the water rushing into the door openings resulted in the aircraft nosing over in the water.
3. The hinged cover plate for the bomb door push button switch was not re-installed following maintenance to replace the push button switch. The push button was exposed, making an inadvertent selection more likely.

Safety action

The operator has verified that every Twin Otter aircraft in their fleet is equipped with the cover plate over the bomb door push button switch. The operator will ensure that any future modifications to aircraft will be standardized to decrease the potential for inadvertent operation of systems.

TSB Final Report A03O0156—Engine Failure and Forced Landing on Water

On June 24, 2003, a Mooney M20E aircraft, with only the pilot on board, departed the Midland/Huronia Airport, Ont., at 07:15 EDT, on a VFR flight to Charleston, West Virginia. A few minutes after takeoff, the pilot transmitted a distress call to Toronto Buttonville flight service station (FSS), reporting that the engine had lost power and he was diverting to Collingwood airport for an emergency landing. Shortly afterwards, he reported a total loss of engine power and his intention to ditch the aircraft in Georgian Bay. At 07:23 EDT, he reported his position to Toronto Buttonville FSS as 7.5 SM from Collingwood at 3 000 ft ASL, and indicated that the ELT was armed. This was the last radio transmission from the aircraft. The aircraft struck the water shortly thereafter. Two pilots flying in the vicinity heard the distress call. Both pilots volunteered to divert to the last position reported by the Mooney, but their search for the aircraft was unsuccessful. The RCC was notified, and at 09:12 EDT, located the aircraft submerged in 58 ft of water, 5 mi. west-southwest of Wasaga Beach, Ont. Divers were requested, and brought to the site by helicopter. The divers entered the water at 09:32 EDT and examined the aircraft, but could not locate the pilot. Once search and rescue (SAR) personnel departed the site, police divers took over the search for the pilot; his body was found at approximately 19:30 EDT.

Findings as to causes and contributing factors

1. Examination of the fuel servo revealed water contamination and corrosion in the fuel metering unit of the servo, resulting in reduced outlet fuel pressure to the fuel injectors. The engine quit as a result of the reduced fuel pressure, and the aircraft descended into the water.
2. The ELT did not transmit an emergency signal after it was selected to the ON position. The absence of a signal from the transmitter likely increased the time required by SAR personnel to locate the aircraft. △

Wind at Your Back—The Hidden Dangers of Tailwind

by Gerard van Es, National Aerospace Laboratory NLR, Amsterdam, Netherlands

Tailwinds are very welcome when you are flying from A to B since they help shorten your flight time. However, close to the runway they can be anything but welcome. Even a bit of tailwind can be a hazard. Tailwind conditions can have adverse effects on aircraft performance and handling qualities in the critical flight phases of takeoff, approach and landing.

Performance regulations require that takeoff and landing distance data include correction factors for not less than 150 percent of the nominal tailwind component along the flight path. This margin is used to cover uncertainties in the actual wind condition. Aircraft flying at low speeds are relatively more sensitive to tailwind with respect to airfield performance. For instance, a 10 kt tailwind increases the dry runway landing distance of a large jumbo jet by some 10 percent, whereas for a small single-engine piston aircraft the landing distance increases by some 30 percent. A small piston aircraft has an approach speed that is about half of that of a jumbo jet. A 10 kt tailwind will therefore increase the ground speed of this small aircraft relatively more than for the large jumbo jet, which explains the larger impact on the landing distance. On slippery runways, aircraft are more sensitive to variations in tailwind with respect to landing distance than on a dry runway. Tailwind-related overrun accident data show that in 70 percent of the cases, the runway was wet or contaminated. Clearly, the combination of tailwind and a slippery runway is a hazardous one, which should be avoided.

History tells us that tailwind is especially dangerous during the approach and landing. When an approach is made with tailwind, the rate of descent has to increase to maintain the glide slope relative to the ground. With a constant approach speed, the engine thrust must decrease with increasing tailwind to maintain glide slope. In high tailwind conditions, the engine thrust may become as low as flight idle. Flight idle thrust during the approach is undesirable for jet aircraft because engine response to throttle input is slow in this condition, which can be a problem when conducting a go-around. It can also become difficult to reduce to final approach speed and to configure the aircraft in the landing configuration without exceeding flap placard speeds. A high tailwind on approach in itself may also result in unwanted excessive rates of descent. All these effects can result into unstabilized or rushed approaches.

When applying normal landing techniques, pilots who land their aircraft with a higher than normal approach speed tend to bleed off the speed by floating the aircraft. Floating the aircraft just off the runway surface before touchdown should be avoided because this will use a significant part of the available runway. In case of a tailwind operation, the associated increase in ground speed will further increase the landing distance. As the aircraft comes closer to the ground, the tailwind will normally decrease. This has a temporary lift increasing effect due to the increase in true airspeed (inertial effect), making it more difficult to put the aircraft on the ground, which amplifies floating of the aircraft. History tells us that in more than half of tailwind-related overrun accidents, floating took place.

Another problem is the combination of tailwind and wake vortices during the landing. The wake behind an aircraft will normally descend below the flight path the generating aircraft has flown. In a light tailwind, the wake may be blown back onto the glide slope, making an encounter more likely than under normal headwind conditions. Analysis of wake vortex incidents indeed shows that the incident probability during an approach is somewhat higher in light tailwind (1–2 kt) conditions.

Wake vortices may decay less quickly at the point of flight path intersection, when a light quartering tailwind is present. This tailwind condition can move the vortices of the preceding aircraft forward into the touchdown zone. Therefore, pilots should be alert to a larger aircraft upwind from their approach and take-off flight paths. Wake vortex incidents that are attributed to light quartering tailwind are not uncommon, but are not always recognized as such. Incident data from a European airport indeed shows that the wake vortex incident probability is significantly higher in light quartering tailwind conditions. So the next time you make a tailwind landing, watch your back! △

More Thoughts on the "Accountable Executive"

While *Blackfly Air* managers briefly explained their understanding of the "accountable executive" concept on page 6 (which was right on by the way, but somewhat narrow), here is perhaps a more appropriate explanation. *The accountable executive is the person with control of the financial and human resources required for the operations authorized to be conducted under the operations certificate*. The accountable executive is also responsible for establishing and maintaining the safety management system (SMS). For further information, consult *Safety Management Systems for Small Aviation Operations—A Practical Guide to Implementation* (TP 14135), and *Safety Management Systems for Flight Operations And Aircraft Maintenance Organizations—A Guide to Implementation* (TP 13881). △

Thank goodness for Canadian pilot training—it saved my life!

Dear Editor,

A couple of years ago, I was departing from Nelson, B.C., in my Piper Comanche. It was early September, and I was heading back east after a vacation. While the weather was quite good, I filed IFR rather than flying the valleys. I filed to Billings, Montana, starting on the Victor Airway that goes right over Nelson to Lethbridge, Alta. I filed at 11 000 ft.

It was a beautiful early morning when I left Nelson and flew down the west arm of Kootenay Lake, B.C., climbing until I could make contact with Vancouver Centre. I was instructed to climb to 12 000 ft, and upon reaching my assigned altitude I levelled-off and established myself on the airway. As I sped along, enjoying the scenery, I noticed cloud ahead of me. As I entered the cloud, I also noticed that the temperature was -1°C.

I very quickly noticed clear ice building on the temperature probe, informed Vancouver, and asked for lower. After a short while, they cleared me to 11 000 ft. I was already noticing an airspeed drop and higher angle of attack (AOA) to keep my altitude. At 11 000 ft, I broke clear of cloud and tried to level off. I was having difficulty in holding 11 000 ft, my AOA was high and my airspeed was dropping. The temperature was still below freezing. I am still amazed how quickly this condition materialized.

To my left, actually near the Great Divide, I could see the valley that winds down through to Fernie, B.C. At this point, with my airspeed at 95 kt, I made the decision to drop down into the valley to above-freezing temperatures and clear whatever ice had now built up under my wings. Another amazing fact, and a lesson to be learned is that no ice was visible on the leading edge; it was only on the temperature gauge and the windshield.

At that very second, when I mentally made the decision to descend, the left wing violently stalled. In a heartbeat, I was in a spin, and just like my training days, I could see the ground below rotating and coming closer.

I had not performed a spin recovery in 17 years—at which time I entered them intentionally—and did not have any experience with a spin recovery in a Comanche. The recent John F. Kennedy Jr. tragedy had probably made me think about spins and spirals, and due to the number of publications that highlighted the incident, I did quite a bit of reading about it. Amazingly, I could hear my instructor, Bill Tourtel of Hamilton, Ont., methodically saying, "power off, opposite rudder to the direction of the spin, when spin stops allow airspeed to increase before establishing level flight, increase power to maintain straight and level flight."

With the throttle right off, and the gear warning screaming, I went through the routine. As soon as I put full opposite rudder, the spin stopped instantly, the ground stopped spinning, and I started breathing. The rest was just like training. After full recovery, I flew out through the Kicking Horse Pass, B.C., and re-established my IFR flight plan on to Billings once clear of the mountains.

I am glad I trained in Canada, where spins are part of your licence requirement. If I had trained in some other countries, I would probably be another statistic in the Rocky Mountains.

Bill Tourtel was chief flying instructor (CFI) at Peninsular Air in Hamilton. Wherever you are Bill, thank you for your superb instruction; after 17 years, I did not forget it, and it saved my life. I have heard talk of taking spin training out of the Canadian training requirements, as in the USA. I am living proof that this would not be a good idea.

Name withheld on request

Very, very interesting story. First, your account of the icing build-up sends a strong message to all. Asking for lower before entering a cloud with the temperature being near the freezing point should be a strong consideration. Your decision to ask for lower, albeit a tad late, was vital and still was not enough to prevent the stall. Your spin recovery is commendable, so is your willingness to share this episode with the ASL *readership. Regarding your comment "I have heard talk of taking spin training out of the Canadian training requirements…", spin training remains a requirement in Canada.* Stall/Spin Awareness—Guidance Notes—Private and Commercial Pilot Training *(TP 13747E), have been developed to assist the conduct of this training. Exercise 13, Spin, is no longer tested on the private pilot flight test, but students are still required to demonstrate competency in spin recoveries to their instructors. —Ed.*

IT'S COLD OUT THERE! BRING APPROPRIATE CLOTHING!

Amphibious Flip

This amphibious float-equipped Cessna A185F was being flown a short distance between water bases. The pilot called the nearest flight information centre (FIC) to advise that the aircraft was on approach and would be landing at destination. The aircraft touched down with the amphibious wheels extended and the aircraft overturned on landing. The uninjured pilot was taken to hospital, examined and subsequently released.

Why did the pilot forget the wheels you ask? Could the short transit and rushed procedures have had anything to do with it? —Ed. △

About CASARA

The Civil Air Search and Rescue Association (CASARA) is a Canada-wide volunteer aviation association dedicated to the promotion of aviation safety, and to the provision of air search support services to the National Search and Rescue Program. Membership is open to aircraft owners and pilots, as well as to those who wish to receive training as spotters and navigators. Members receive training in fields such as aviation safety, meteorology, survival awareness and search techniques and procedures.

The Association:

- participates in aviation safety and search and rescue training programs;
- provides air search support services;
- provides suitable aircraft;
- provides highly-trained, safety-conscious crews to fly as pilots, navigators and spotters on Association aircraft, and as spotters on Canadian Forces aircraft as required;
- provides an insurance package including personal accident, hull and liability coverage;
- provides administrative support; and
- provides reimbursement for aircraft operating expenses based on aircraft horsepower and local fuel costs.

Participants in CASARA benefit by receiving training from professionals that strives to improve their level of airmanship and give them the ability to safely and effectively provide assistance to people in distress. System Safety supports CASARA activities and encourages aviation enthusiasts to consider participating in this essential and worthwhile program. For more information, please visit the CASARA Web site at www.casara.ca. △

One Minor Event Leads to an Expensive One...

Here is a lesson that could have happened to any of us, and from which we can all learn. The pilot had just taken off in a Piper PA23-160 Apache from a long, paved runway, when he noticed that gasoline was leaking from the left wing fuel cap. The fuel tank cap had been improperly closed after refuelling or during the walk-around. The pilot assessed that there was enough runway remaining to land straight ahead, and he lowered some flaps and lowered the landing gear. Unfortunately, there was not enough time for the landing gear to complete the extension cycle and the aircraft landed on its belly. Both propellers were bent and the flaps were damaged. In this situation, a quick circuit and return to point of departure would have likely been enough to solve the problem. An open door or cargo door indication could lead to a similar situation. The golden rule of aviation always remains the same: *Aviate, Navigate, and Communicate*. △

Propellers are shown after the occurrence, damaged beyond repair.

Jammed Throttle Levers or Pilot Technique?

A Safety Information Letter from the Transportation Safety Board of Canada (TSB)

On June 3, 2004, during training exercises, the captain of a Beech 99 Airliner could not advance the power levers during a balked approach procedure. During the overshoot, the captain had called for power, gear and flaps up, but found that the power levers were stuck when an attempt was made to move them. The gear and flaps had been raised by the training pilot in the right seat, and with reduced power, the aircraft began to settle to the ground. The training pilot reached over to assist the captain, and pushed the power levers forward. The engines eventually spooled up and the overshoot was completed. Unbeknownst to the crew, the aircraft's belly pod had touched the runway prior to the overshoot. The belly pod damage was later discovered during a maintenance inspection.

During the debriefing and examination of the aircraft after the incident, it was discovered that if the power levers are lifted or raised slightly during movement, they hit a detent and become jammed. The occurrence captain had been sitting low in his seat and was using the palms of his hands to push up and forward on the power levers. Because of this upward movement, the levers hit the detent and jammed. When the training captain reached over and pushed the throttle levers forward, it was in a sliding motion that bypassed the detent.

The operator checked its remaining fleet of Beech 99 and King Air A100 aircraft and found this condition can occur on all of them if the power levers are sufficiently raised. The operator has since included this awareness as part of its ground school training syllabus. It is not known what models of the Beech 99 and King Air aircraft that this anomaly extends to; however, jamming of the power levers in any model could result in serious consequences if immediate power is required and not available. The foregoing is provided for whatever follow-up action is deemed appropriate.

Transport Canada (TC) reviewed this incident and is of the opinion that the throttles were operating normally, there was no "jam" and there was no aircraft defect or design problem. The design of the idle stop is such that the throttles may only be retarded into reverse after they are lifted and, conversely, that they will only move forward into positive thrust when they are in the lower position. In this case, when the pilot inadvertently pushed the throttles up, they did not move forward because they were blocked by the forward idle gate. This behaviour of the throttle "system" is similar to that in all the King Air family of airplanes. The throttles were "blocked" by the gate but were not "jammed." In this case, the throttles operated as they were designed.

It can be accepted that a pilot might apply enough upward pressure on the throttle levers to encounter the face of the "gate" and have forward travel blocked, thus preventing application of more than idle power. However, in this case, the crux of the problem was the upward force coupled with the procedure whereby the wheels (and flaps) are raised prior to full or maximum continuous power being applied. The procedure, as described in the letter above, is contrary to the recommended procedure in the flight manual, and is not good airmanship. The flight manual implies that not only is the power to be applied first, but a subsequent rate of climb is to be achieved before raising the gear. Leaving the gear down until after the power is set ensures for the proviso that the aircraft will touch on the wheels if the sink rate is not arrested in time. TC agrees that "jamming" of power levers would need to be investigated and corrected, but believes that in this case "jamming" is not an appropriate categorization of the event. The more relevant lessons to be drawn from this incident are shortcomings in pilot technique, safe training practices, crew resource management, standard operating procedures and adherence to aircraft flight manual procedures. Raising the flaps and gear before establishing climb power and speed is clearly poor airmanship and contrary to the aircraft flight manual. These issues have been addressed with the operator involved. —Ed.

Canadian Aviation Safety Seminar (CASS) 2005 Reminder!

Come to picturesque Vancouver, B.C., from April 18 to 20, 2005 for CASS 2005! The theme is *Aviation Risk Management in the 21st Century*. See all details on program and registration at www.tc.gc.ca/CASS.

TAKE FIVE...

for safety

Five minutes reading could save your life !

Pre-flight Planning Actions to Avoid Airframe Icing

The following is an excerpt from A Pilot's Guide to Safe Flying *by Sander Vandeth, reprinted with permission.*

Preparation is the key strategy for avoiding icing and managing any inadvertent icing encounter. It should include an assessment of your knowledge, experience and proficiency with respect to flying in conditions conducive to airframe icing.

– Obtain a comprehensive weather forecast and briefing. Check:
  - for any forecast icing on takeoff, en-route and landing;
  - the extent of frontal activity, convective activity and rising terrain when below freezing temperatures are forecast aloft (this will aid in ascertaining the likelihood of localized icing);
  - the cloud tops and thickness;
  - the locations of any areas of warm air;
  - the likelihood of freezing rain.

– Avoid the "freezing zone" (0°C to -20°C) when there is visible moisture or the likelihood of freezing rain.

– Pick a route where the minimum en-route altitude is below the forecast freezing level or you are able to fly in clear conditions.

– Avoid flying just above the tops of cloud, as they can rise rapidly and water concentration is greatest near the top of cloud.

– Have an escape plan should icing be encountered en-route.

– If you have anti-icing equipment, make sure it is functioning properly before takeoff, and that you plan for minimum exposure during climb and descent.

– Provide extra fuel margin.

– Review the pilot operating handbook (POH) to refresh your memory on the airplane icing limitation and procedures.

Sander Vandeth is a mechanical engineer with many years of flying experience in Canada and Australia. He is a passionate advocate of aviation safety and his manual A Pilot's Guide to Safe Flying *is the product of several years of exhaustive research and consultation. For more information on the manual, or to contact the author, visit* www.mcove.com.

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VFR flight in bad weather can mean a dead end. So don't let the pressures of work, time, and the customer bring you down.

Pressures keep pilots in the air against their better judgement long after they should have turned back or cancelled the flight.

Did this pilot really have to go? The weather wasn't good but the pilot pressed on in deteriorating weather and worsening visibility.

No enroute weather checks and no turning back: deadly decisions.

It's better to arrive late in this world than early in the next!

THEY DIDN'T MAKE THE MEETING!

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