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 1/2004**

Sometimes You Do, Sometimes You Don't…

On June 11, 2002, a Piper PA-31-350 Chieftain was on an instrument flight rules (IFR) flight from Gunisao Lake, Man., to Winnipeg. One pilot and six passengers were on board. At 09:13 central daylight time (CDT), the aircraft began an instrument landing system (ILS) approach to Runway 13 at Winnipeg International Airport. The captain flew the approach at a higher-than-normal approach airspeed, well above the glide path. When the aircraft broke out of the cloud layer, it was not in position to land safely on the remaining runway. The captain executed a missed approach at 09:16, and shortly thereafter, at 09:18, the captain declared a 'Mayday' for an engine failure. Less than 20 seconds later the captain transmitted that the aircraft had experienced a double engine failure. The aircraft crashed at a major traffic intersection at 09:20, striking traffic signals and several vehicles. All seven of the aircraft passengers and several of the vehicle occupants were seriously injured; one passenger subsequently died of his injuries. The aircraft experienced extensive structural damage, with the wings and engines tearing off along the wreckage trail. There was a small post-crash fire in the right wing and engine area. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A02C0124.

The aircraft was fuelled to its maximum capacity at the company's base in Swan River, Man., the night before the accident. The aircraft was then positioned in Winnipeg to fly a group to Gunisao Lake and return with another group. The positioning flight, which was flown by another company pilot, took 1 hr 38 min, and the aircraft was not refuelled after arrival in Winnipeg.

The pilot had about 3 000 hr of flight time, and had been a flying instructor prior to joining the company 16 months before the occurrence. He had flown many similar flights into Gunisao Lake and was aware that 100 LL aviation gasoline was not available at that location. On the morning of the accident, he reported for duty at 04:20 and checked the weather; he noted that instrument meteorological conditions (IMC) existed at Winnipeg and for part of his route. He filed IFR flight plans from Winnipeg to Gunisao Lake and back. The alternate aerodrome that he filed for both flights was Island Lake, located about 258 NM north of Winnipeg. During his pre-flight checks, he noted that the total fuel was approximately 3/4 of the total capacity of the aircraft. He took seven passengers with baggage for the flight to Gunisao Lake, and did not complete weight and balance or fuel calculations on the operational flight plan and load control form provided in his company's Operations Manual (OM). Based on his belief that a full load of fuel would provide approximately 5 hr of flight time, he made a mental estimate that there was sufficient fuel to complete the round trip to Gunisao Lake. He estimated that the 3/4 full tanks would allow him to return to Winnipeg with a fuel reserve of 50 min and he did not refuel. *(These mathematical gymnastics on fuel calculations ultimately proved fatal for one passenger, and this practice is unfortunately too common in the aviation industry…keep reading.)*

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The pilot estimated the flight time from Winnipeg to Gunisao Lake on his operational flight plan as 1 hr 20 min. The actual aircraft flight time was approximately 1 hr 31 min. At Gunisao Lake, the seven passengers disembarked with their baggage and the pilot accepted six passengers and 450 lbs of baggage for the return flight. He once again failed to make any weight and balance or fuel calculations on the operational flight plan and load control form. The pilot estimated the flight time from Gunisao Lake to Winnipeg on his operational flight plan as 1 hr 20 min. The actual aircraft flight time from Gunisao Lake until the overshoot at Winnipeg was 1 hr 30 min.

When the pilot began the approach at Winnipeg, the reported weather for Winnipeg was as follows: winds 200° at 8 kt; ceiling overcast at 300 ft; visibility 1 SM in light drizzle and mist; altimeter setting 29.81 inches.

For flight planning purposes, the company used a fuel consumption figure of 240 pounds per hour (pph) for the first hour. This figure included a 30 pph allowance for taxi, takeoff and climb. For subsequent hours of flight the company used a consumption figure of 210 pph. The pilot had also noted that flight time to dry tanks was 4 hr 45 min. A review of the aircraft journey log and available refuelling records for five days prior to the accident permitted the determination of an average fuel usage of 225 pph for the occurrence aircraft.

Before the aircraft was on approach into Winnipeg, the right engine low fuel pressure light illuminated and the right engine sputtered. Fuel cross feed was selected. The right low fuel pressure light then went out and the engine returned to normal operation. The pilot did not declare an emergency or ask for assistance during the return flight to Winnipeg before executing the missed approach. (*It is unfortunately common practice for some pilots to delay declaring a fuel emergency until it is too late; while it may save their lives, pilots would rather risk death than face self-exposure to reckless planning and all the paperwork associated with declaring an emergency…keep reading)*

The pilot flew the ILS Runway 13 at Winnipeg, recognizing that the fuel situation was critical and that engine power loss was imminent. He intentionally flew the aircraft well above the glide path for the ILS and at speeds significantly faster than normal, in order to have more time to respond to an engine power loss. The aircraft crossed the missed approach point well above the glide path. The pilot continued to descend past the missed approach point and was observed by tower controllers after breaking out of the cloud layer at about 200 ft AGL, with about 3 200 ft of runway remaining. *(The pilot knew he was in serious trouble at the missed approach point and that a successful missed approach was not in the cards; yet he did not declare an emergency because he still thought, at that moment, that he would actually get away with it…keep reading)*

The pilot was not in a position to land safely on the remaining runway and executed a missed approach, about 4 min prior to the crash. The pilot finally attempted to inform the controller during the missed approach that he had an urgent fuel problem; however, this critical information was not received by the controller. During the missed approach, the pilot switched the fuel selector from cross feed back to the main tanks in order to conserve the remaining fuel in the left tank for the left engine. The right engine then lost power and he feathered it. Approximately 3 min before the crash, the pilot advised the approach controller that he would like to expedite and return to the airport as soon as possible. Approximately 30 seconds later, the left engine lost power and the pilot transmitted a "Mayday" call. The aircraft was not in a position to return to any runway and the pilot executed the forced landing at the city intersection.

There were no pre-existing mechanical problems with the aircraft, and no indication of fuel leaking or venting. The operator's OM required that the pilot-in-command of a Navajo aircraft on an IFR flight ensure that there is sufficient fuel to fly to the destination, execute an approach and a missed approach, and then fly to the alternate aerodrome and land with a reserve of 45 min. It also stated that all flights must be authorized by the Operations Manager or Chief Pilot and that a flight release will not be given until the pilot-in-command has completed an operational flight plan. However, company supervisory personnel indicate that, in practice, a flight release is not required and that a pilot self-dispatch system is used. The OM also requires that a weight and balance form be completed for each flight and signed by the pilot-in-command.

The *Canadian Aviation Regulations* (CARs) require that the aircraft be equipped with an autopilot for single-pilot IMC operations, but technical records indicated that the autopilot had been removed from the aircraft in April 2002, while the appropriate journey log entries to that effect had not been made. Company supervisory personnel were present and aware, as was the occurrence pilot, that the aircraft was not equipped with an autopilot and that one was required for single-pilot operations in the conditions of that morning.

Analysis—The pilot's pre-flight fuel estimate, which led to his conclusion that he would have 50 min of fuel on arrival in Winnipeg, was incorrect. The total flight time from Swan River to Winnipeg plus the flight plan estimates for the flight to Gunisao Lake and return was 4 hr 18 min. These flights would have used 993 lbs of fuel using the company's guidance of 240 pph and 210 pph for the first and second hours respectively. This would have left a reserve of 99 lbs or 28 min of fuel, which

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was not sufficient for the flight to the filed alternate of Island Lake and the required hold time of 45 min.

The total actual flight time from the refuelling in Swan River until the pilot began the missed approach at Winnipeg was 4 hr 38 min. Since this included three separate flights, the calculation of the expected amount of fuel remaining on arrival at Winnipeg would be approximately 25 lbs or 6 min of fuel. The aircraft experienced a complete engine power loss 4 min later and, therefore, it is concluded that the power loss was a result of fuel exhaustion.

The pilot's decision to fly the ILS well above the glide path and at a higher-than-normal airspeed resulted in an ineffective approach from which a landing could not be made, although the reported weather at the time of the approach was better than the landing minima for the ILS to Runway 13. The pilot's decision to continue the approach well beyond the ILS missed approach point did not assure obstacle clearance while in proximity to the ground in cloud. His decision to modify the approach reduced, rather than increased, flight safety.

Although supervisory personnel were present when the pilot began his flight, none took any action when the pilot began his flight into IMC without an autopilot. The level of supervision that the company should have provided was not achieved on this series of flights, and company practices did not conform to the company OM regarding flight release.

Improper fuel management: sometimes you get away with it, sometimes you don't. —Ed.

Aviation Safety Seminars—Quebec Region

The 2004 season of the Transport Canada, Quebec Region Safety Seminars is due to begin in late January. Remember that it is an easy and efficient way to meet the recency requirements set out in CAR 421.05, and it allows you to get together with other pilots! For more information go to: http://www.tc.gc.ca/quebec/en/aviationSafety/schedule.htm or contact us at 514 633-3249, or by email at qcsecursys@tc.gc.ca. Please note that our seminars are in French unless otherwise specified. Hope to see you there!

In This Issue

Collision with Windrow

On January 11, 2003, a Beech 1900D was taxiing on Runway 02/20 at St. John's International Airport, Nfld., when the aircraft struck a 2-ft high windrow, which lay across the runway just to the north of Taxiway Charlie. There were no injuries to the 10 passengers and 2 crew members. The aircraft sustained substantial damage. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A03A0002.

St. John's airport has three runways—11/29, 16/34, and 02/20—and all three are used throughout the year. Because of its Category II instrument approach capability, and unless wind conditions clearly favour Runway 16/34, snow clearing efforts are initially focused on preparing Runway 11 and the associated runways and taxiways that are necessary for access. Runway 02/20, north of Taxiway Charlie to the entrance to Taxiway Bravo, is last in priority when either Runway 11/29 or 16/34 is active. The St. John's airport winter maintenance plan includes criteria for the closing of an active runway because of contamination. One of these criteria is that an active runway should be closed if there are windrows in excess of 12–in. high. The plan, however, does not contain instructions for the closing of non-active runways such as the portion of Runway 02/20 north of Taxiway Charlie.

Windrows in areas such as the one north of Taxiway Charlie are not normally encountered by taxiing aircraft, and are not usually reported to the ground controller, nor indicated on the runway surface condition (RSC) reports. The normal practice at the airport is for snow removal crews to advise the ground controller of windrow hazards when they hear a taxi clearance, or a request for taxi, through an area with a windrow. CAR, 302.07(2)(b) - *Obligations of Operator*, requires that the airport operator provide the air traffic control (ATC) unit with immediate notice of the existence of any obstruction or hazar-dous condition affecting aviation safety at the airport.

The night before the accident, the weather was varied. Light snow had been falling and maintenance activities were focused on clearing snow from Runway 11 and the related taxiways. It could not be determined precisely when, or by whom, the windrow was created; however it is during this initial period that the windrow to the north of Taxiway Charlie was created by plowing activities.

Between 06:00 and 06:30, freezing drizzle started falling at the airport and a taxiing Airbus slid while backtracking on Runway 11; the crew radioed the tower that they were at the runway edge and unable to manoeuvre from that position. Coincidentally the wind shifted, favouring Runway 16. The lead-hand and the field maintenance crews were now preoccupied with two tasks: extricating the Airbus from the button of Runway 11, and preparing and inspecting Runway 16 for use. By about 07:55, the Airbus had been towed and inspected by company maintenance personnel.

Artist's impression of collision with windrow.

Around 08:15, the day lead-hand proceeded onto the airfield to relieve the night lead-hand. Normally, one of the first actions of an oncoming lead-hand is to inspect the entire airfield by vehicle. However, in this instance, the oncoming lead-hand proceeded directly to Runway 11/29 to meet with the night lead-hand and lend assistance with the Airbus. The customary airfield survey was not completed. The wind shifted again and it was decided to switch to Runway 29. Airfield maintenance sanded the runway and the threshold of Runway 29. The night lead-hand completed an inspection of Runway 29, and then departed the airfield at about 08:22. The Airbus took off from Runway 29 at 08:40.

At 08:41, the Beech 1900D was cleared to taxi via Foxtrot, Runway 02, and to hold short of Runway 29. An analysis of the flight data recorder (FDR) information showed that the aircraft was travelling at about 8 kt and was accelerating when it rolled out on the runway, heading on Runway 02. As the aircraft approached the intersection of Runways 02 and 34, there were several snow removal vehicles on Runway 34 east of the intersection. After confirming that the vehicles were holding short, the crew proceeded through the intersection, initiating the "instruments" portion of the taxi check 9 seconds prior to striking the windrow. According to the operator's standard operating procedures (SOPs) for the instrument cross-check, the captain (pilot flying), must look inside the cockpit to call out indications from the aircraft's flight instruments. Meanwhile, the first officer (pilot not flying) is also supposed to monitor the instruments and when found correct should respond, "Checked and set left/right." As the crew was conducting this check, the windrow was spotted. The aircraft was now 3.5 seconds and 146 ft from the windrow and travelling at 24 kt. The captain attempted to stop with wheel braking, approximately 2 seconds later and 60 ft short of the windrow. When the wheel brakes were applied, the aircraft started to skid on the slippery runway surface. The captain attempted to apply reverse thrust, but there was insufficient time for it to be selected before the nose wheel struck the windrow, at 23.5 kt. The propellers struck the windrow next, followed 1/4 second later by the main gear, which struck the windrow at approximately 20 kt.

The lowest point of the propeller tip path on the Beech 1900D is 14.07 in. from the ground. When the propeller blades struck the 2-ft high windrow, all four blades from the right engine and one blade from the left engine broke off near the hub. The blades from the right engine struck the starboard aircraft fuselage at the forward passenger cabin window. This window shattered and the window fragments and frame were thrown forcibly into the cabin. A mother and her infant, who were seated immediately next to the window, narrowly escaped injury. The crew stopped the aircraft 175 ft past the windrow, secured the engines, shut off the electrical power, and escorted the passengers from the aircraft. The ground controller noticed the passengers deplaning and activated the crash alarm.

Runway 02, from Taxiway Charlie to Runway 29, had not been traversed by any vehicles prior to the accident. The runway had not been cleared during the previous night, and there were no RSC reports produced for the runway. As the location of the windrow north of Taxiway Charlie was well to the north of Runway 16/34, the windrow did not appear on any of the RSC reports produced that night. After the accident, Runway 02/20 north of the windrow was found to be covered with a combination of ice and patches of thin snow.

Analysis—Several factors combined to allow this large windrow to remain unreported. Neither lead-hand nor the ground controller were made aware of the creation of the windrow because of the practice of only reporting windrows on active runways. The location of the windrow was in an area that was not used by either ground vehicles or aircraft until Runway 29 became active, and it was outside of the areas inspected by the night lead-hand during his shift. The night shift had a significantly increased workload because of the freezing drizzle, the stranded Airbus, and the frequent runway changes. These factors likely diverted attention away from ensuring that the taxi route north of the Charlie intersection was usable when Runway 29 became active. The shift change for the snow removal crews coincided with the towing of the Airbus, the runway change, and the issuing of the taxi clearance to the Beech 1900D. The windrow was the result of snow plowing activities, and it is likely that whoever had knowledge of the windrow had departed the field prior to the taxi clearance being issued and would not have been available to warn of the existence of the windrow. The oncoming lead-hand did not perform the customary field survey and inspection because of the pressing need to prepare Runway 29 and move the stranded Airbus. A field inspection would have allowed for the detection of the windrow and for action to remove it or communicate its presence to the ground controller.

Runway 02 north of Charlie is a low-priority surface, and was not used prior to the Beech 1900D by either vehicles or aircraft. The surface had not been cleared, was not usable, and was not necessary, yet it remained open. The St. John's airport winter maintenance plan does not contain guidance to field maintenance personnel for the closure and subsequent re-opening of these non-essential surfaces.

The crew's previous safe transit through the intersection and the lack of any warning of obstructions along their taxi route resulted in them proceeding with their normal taxi routine, and without extra vigilance for taxi hazards such as windrows. The flat-light conditions and the white background of the uncleared portions of the airfield also caused the windrow to blend into the background, making it less conspicuous from a distance. Approaching the intersection, the crew's attention was diverted by the presence of snow removal vehicles on Runway 16/34 that were approaching their location. During the subsequent taxi check, the first officer was reading the checklist and the captain's attention was focused inside the cockpit, as he was verifying his flight instruments. These actions and the inconspicuousness of the windrow prevented the crew from seeing it earlier.

The taxi speed of the aircraft and the icy condition of the runway hindered the stopping of the aircraft, and consequently did not allow time for the captain to apply reverse thrust. Had the aircraft's taxi speed been less, more time would have been available for the crew to recognize and react to the windrow. With more time to react, it is possible that the crew could have stopped the aircraft prior to the collision.

As a result of this occurrence, the St. John's Airport Authority has issued a memorandum, which allows the lead hand to close Runway 02/20 when conditions require. △

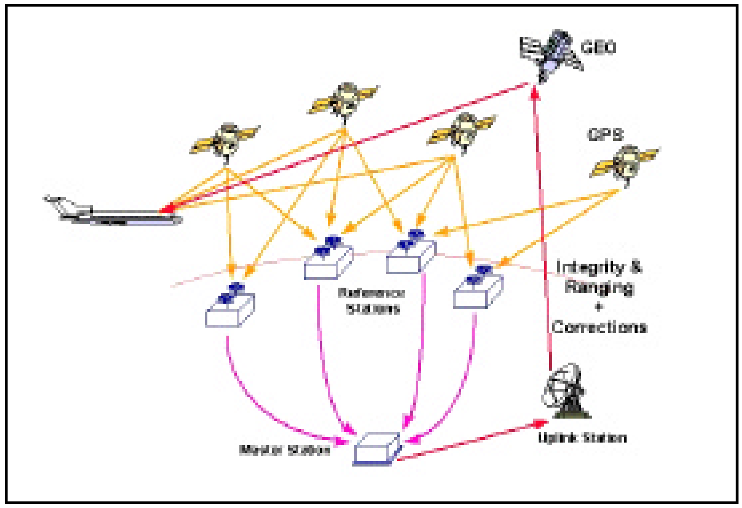
CASS 2004—Time for a little T.O.!

The 16th annual Canadian Aviation Safety Seminar (CASS) will be held in beautiful Toronto, Ontario, April 19–21, 2004. CASS is an international event hosted annually by Transport Canada for all sectors of the aviation community. The theme for CASS 2004 is "The Future of Aviation Safety" which calls for nothing less than gazing into the crystal ball to get a sense of the safety issues the industry and regulatory authorities will face between now and the end of the decade. For information on how to register, visit www.tc.gc.ca/CASS. Time for a little T.O.! △

Global Positioning System/Wide Area Augmentation System (GPS/WAAS)—Satellite Navigation (SatNav) Phase 2

by Ross Bowie, Director, ANS Service Design, NAV CANADA

Canadian pilots have been using GPS since the early 1990s as an aid to visual flight rules (VFR) navigation and for IFR en route, terminal and non-precision approach operations. For the IFR pilot, the ability to go direct saves time and fuel, and RNAV (GPS) approaches often mean lower minima. These approaches also have safety benefits because they can be aligned with the runway, eliminating the need to fly circling procedures in low visibility. The accuracy of GPS also means that the runway will be straight ahead, reducing the need for visual manoeuvring to line up and land.



The above diagram illustrates WAAS system elements and data flow.

With the advent of the WAAS, we are entering a new phase that promises even better approaches. The U.S. Federal Aviation Administration (FAA) commissioned WAAS on July 10, 2003, and WAAS signal coverage extends into Canada. NAV CANADA is working with the FAA to expand WAAS coverage, and is working with Transport Canada on the regulatory aspects of WAAS operations in Canada.

WAAS uses a network of reference stations that monitor GPS satellite signals and send data to a master station, which creates a WAAS message containing corrections and integrity data. The WAAS message is uplinked to geostationary (GEO) satellites orbiting over the equator, which broadcast the message over a hemisphere.

Aircraft WAAS receivers apply the WAAS message to the data from GPS satellites, resulting in horizontal and vertical accuracy that is usually better than 2 m. Even more importantly, the integrity portion of the message provides assurance that the aircraft will not be misled by a faulty satellite signal. The end result is a high availability of en route, terminal and approach guidance.

Like GPS, WAAS supports non-precision approaches, but it also supports approaches with vertical guidance to decision altitudes as low as 250 ft above ground. This new level of service is termed "LPV" by the FAA because the lateral guidance is as accurate as an instrument landing system (ILS)-based precision approach, and because it provides vertical guidance (**L**ateral **P**recision, **V**ertical guidance). LPV approaches will mean lower decision altitudes, therefore higher airport usability at many sites. Accident records and safety analysis, based on many years of experience with ILS, show that approaches with vertical guidance have a significantly better safety record than non-precision approaches. Why? Vertical guidance translates into a stabilized descent to a decision altitude. The decision to land or start a missed approach is therefore made at a specific point. There have been numerous non-precision approach accidents associated with late decisions to attempt a landing, resulting in excessive descent rates and often excessive airspeeds. If the pilot has the runway environment in sight at the decision altitude, descent can continue without any change in airspeed, flap or landing gear position, and this reduces the probability of striking obstacles or terrain before reaching the runway, landing short or landing long or fast and running off the end (or the side).

The strategy with SatNav has always been to move ahead in stages, providing more capability with each advance in technology. The use of GPS has expanded since it was first approved for IFR flight in Canada in 1993, and now we are moving into the WAAS era, with new operational and safety benefits.

Delivering WAAS benefits requires NAV CANADA to: validate WAAS coverage and performance in Canada against international performance standards; develop a NOTAM system for WAAS-based operations, based on continuous monitoring of system status and modelling of the resulting performance levels; arrange for the precise airport surveys required to support approach procedures; adopt FAA LPV approach design standards, training staff and producing approach charts; continue working with the FAA on fielding WAAS stations in Canada; and, develop flight check requirements for WAAS approaches. This will all be co-ordinated with Transport Canada to ensure that the appropriate regulations are in place. It is expected that the first WAAS approach procedures could be published in 2005. Readers of the ASL will be kept up to date on progress and on the safe use of GPS and WAAS. △

Recreational Aviation

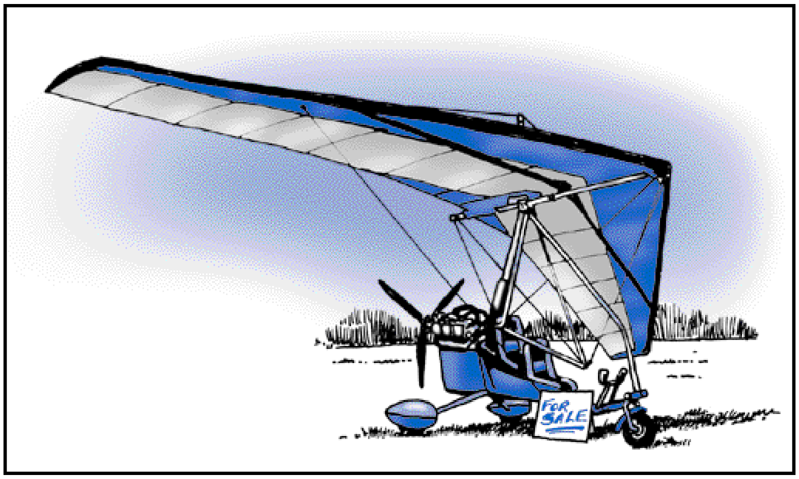
Serge Beauchamp, Section Editor

Buying an Ultralight Airplane—Part II

by Inspector Martin Buissonneau, Recreational Aviation, Flight Training Standards, Transport Canada, Quebec Region

Part II

In the first part of this article, we talked about the importance of defining your needs. We mentioned the type of pilot permit required, the choices and characteristics of airplanes and engines offered, their equipment, the required insurance, and some important considerations to take into account to protect your investment. We will now talk about transporting passengers, buying a new or used airplane, and installing a ballistic parachute.



Transporting passengers

The second question pertains to the choice between a basic and advanced ultralight airplane.

At this time, transporting passengers on a basic ultralight airplane is illegal, except in the following two cases:

1) in-flight training required for issuing a pilot permit—ultralight aeroplane or the endorsement of an instructor rating on a pilot permit—ultralight aeroplane;
2) when two holders of a pilot permit—ultralight aeroplane are on board the airplane (this is also true for the recreational pilot permit—aeroplane and the private pilot licence—aeroplane).

For advanced ultralight airplanes, the pilot may transport a passenger if they hold a licence or permit authorizing the transport of a passenger. In the near future, the holder of a pilot permit—ultralight aeroplane will also be able to transport a passenger after having taken additional training, and passed a flight test, which would remove the "No passengers" restriction on the pilot permit.

For an ultralight airplane to be considered advanced, the following conditions must be met: 1) the manufacturer must have issued a declaration of compliance for the ultralight airplane, 2) the owner must not make any modifications to the airplane, unless the modification was approved in writing by the manufacturer, 3) the airplane must be maintained according to the maintenance program indicated by the manufacturer, 4) the owner must conform to the mandatory actions published by the manufacturer and 5) a poster must be put up in a location that is visible by the two occupants of the airplane and must contain the following: "This airplane is an advanced ultralight airplane that is used without an Airworthiness Certificate." You can check which makes and types of ultralight airplanes are advanced on the Transport Canada Web site. To check if a specific registered airplane is advanced, "Advanced UL de type évolué" must be written in the "Subject" box on the registration certificate. On older registration certificates, "/a" in the "Aircraft Manufacturer Designation" box is also common.

New or second-hand

The third question has to do with the choice between a new or second-hand airplane. It is possible that you will not be able to find a particular make or type of airplane second-hand, or that a certain type of new airplane is not be available.

After having studied and analyzed all of the manufacturer's information on the type you are interested in, go to aerodromes and talk with pilots who own ultralight airplanes to find out more, especially if they own the type of airplane that interests you. Often, people who have nothing to gain or lose by sharing their experience are a good source of information. In addition, searching on the Internet is a good way to find out more about the airplane (check association and manufacturer sites, discussion groups, sites that review certain types, etc.).

Buying a new airplane brings about fewer worries than buying a second-hand airplane. However, new airplanes sometimes have to be assembled and, depending on the make and type, the complexity and the number of hours required to assemble the airplane can vary enormously. It is normal to be unable to assemble the airplane on your own, and if you have any doubts, you should ask for help, whenever possible, from the manufacturer or the authorized representative (if they are able to carry out the work). You may also want to have the airplane assembled by a person with experience, and who is known in the aeronautic field, and if possible, has already assembled the same type of ultralight airplane.

Once the assembly of the airplane is finished, and it has been registered and insured, various tests should be conducted thoroughly. The engine tests and preliminary run-in should be carried out according to the manufacturer's procedures. It is preferable if an ultralight airplane pilot, who has a reasonable amount of experience flying and piloting the type of airplane in question, carries out the in-flight and ground tests of the airplane. Procedures and steps must be strictly followed so that these tests are carried out safely. Given the requirements of these tests, it is preferable to ask an experienced pilot to carry them out.

If you are thinking of buying a second-hand ultralight airplane, here are some things to take into consideration: 1) Has this airplane been in an accident and then been repaired? 2) How many flight-hours do the airframe, engine and propeller have? 3) Was the airplane stored inside or outside? 4) Did the owner have a journey log and a flight maintenance log for the airplane? 5) Does the owner still have the manufacturer's manual, and if not, is it possible to get one directly from the manufacturer? 6) Was the engine and airframe maintenance carried out according to the manufacturer's recommendations? Given the fact that the answers to these questions are difficult for the buyer to check, having the airplane inspected by an expert is a good way of evaluating it before making the final decision.

To close this section on second-hand airplanes, here are some suggestions. For basic ultralight airplanes, beware of any changes made by the owner in order to "improve the type." Have the airplane checked by an aircraft maintenance engineer before buying (they will check the quality and the service life remaining of the fabric, the use of parts that are not authorized for aviation, or on the type in question, the installation or assembly of certain parts using methods that are not approved for aviation, etc.) and have an in-flight test performed by a pilot who is experienced and competent on this type of ultralight airplane. Make sure to check the insurance policy first to avoid complications and legal action in case of an accident. Depending on the airplane's age and general condition, replace basic parts that would render the airplane impossible to fly if there was an in-flight failure. Make allowances for the cost of the parts to be changed and repairs to be made to the airplane.

Here are some more general suggestions. Seriously consider installing a ballistic parachute. They are relatively inexpensive (the price ranges from $700 to $1,500), but are very useful if a major failure occurs. They will let you down almost gently on the ground, and significantly reduce the risk of serious injury. Research the types of protection offered by insurance policies, for example, public liability insurance, insurance on the shell of the airplane while in-flight and/or on the ground, and disability insurance. If you do not hold a pilot permit or licence already, find out from your life insurance company what the consequences are on your annual premium if you become a pilot. Look into the possibility of buying an ultralight airplane with one or two other people, or even the possibility of renting an airplane at a flight school that rents airplanes. You should also make allowances for the cost of training on the new airplane, especially if you have never flown this type of ultralight airplane.

In conclusion, chose an airplane in which you feel comfortable and you would enjoy flying, because after all, this is what recreational aviation is all about.

Food for Thought—Phases of Flight that Lead to Accidents

Statistics taken from the *2002 Transportation Safety Board Statistical Summary of Aviation Occurrences*

We mentioned in the last issue of *Recreational Aviation* that there were fewer accidents in 2002 than in 2001, specifically 7% fewer. Of a total of 323 aviation accidents, which excludes ultralight airplanes, 274 involved Canadian registered aircraft. Accidents are frequently classified according to the first event, or abnormal condition, in the sequence of events that led to the occurrence.

In 2002, the most common first event in airplane accidents was during the take-off or landing phase. They accounted for 21% of all accidents. The second most common first event was an engine power-loss, which accounted for 14% of the total. Loss of control of the aircraft during the take-off or landing phase and collision with an object or terrain were the third and fourth most common first events, and were responsible each for 8% of all accidents.

Accidents most often take place during the landing phase, and account for 35% of all accidents. The aircraft noses-over or blows a tire and the pilot/crew loses control. Accidents in the take-off phase occur when there is a power-loss followed by a loss of control (24% of all accidents). The en-route phase of flight poses its own hazards and accounts for 15% of all accidents.

Students and airplane pilots with a private licence are more commonly involved in take-off or landing accidents, where the first event is a loss of control of the airplane or a engine power-loss. On the other hand, commercial or air transport pilots were involved in proportionally more accidents where collision with terrain, component malfunction or weather-related accident was the first event, than pilots with other types of licence. Recreational flights accounted for 49% of airplane accidents in 2002.

Taking a look at these statistics, we can surmise that recreational pilots can and should take an active role in ensuring that they will not become one of the statistics in next year's analytical study of aircraft accidents. How? A few basic principles of airmanship followed to the letter should provide recreational pilots with the required abilities to conduct each and every flight in a safe and coordinated manner.

If we assume that a pilot is well-rested and has not consumed any drugs or over-the-counter medication that may impair their judgment and physical abilities, they will most likely complete a successful flight when: 1) they have planned well for all of the phases of the flight; 2) they have received recurrent training from a properly licensed and experienced flight instructor; 3) the flight is carried out under meteorological conditions of winds, clouds, temperature and turbulence that do not exceed the capabilities of the pilot and of the airplane; 4) the pilot is familiar with all of the emergency procedures required and is well prepared for such an event; 5) the aircraft is airworthy and the pre-flight inspection has confirmed that all necessary equipment is available and functions properly and that the aircraft weight and balance evaluation is within the prescribed limits.

The above should represent the minimum standards for the conduct of a safe and fruitful flight. Are you up to the task?

Recurrency!! Who Needs It?

*by Jim Trusty, Instructor, National Flight Instructor of the Year (1997), First FAA Southern Region, Aviation Safety Counselor of the Year (1995), and contributing writer for numerous national publications.*lrn2fly@bellsouth.net

The answer to that question is: Just about all pilots who plan on flying proficiently the next time they go up. And I have to admit, it certainly includes you and me. There is nothing worse than a pilot on the ground telling stories about when they used to fly and how good they were, when in reality they are just too lazy or too proud to fly with someone in order to get current again. Pilots are a funny bunch when it comes to someone rating or grading the way they perform in the air. I have people come from 250 mi. away to get a flight review and/or instrument checks, just so no one from their home area knows exactly how good or how bad they may be. The awful truth about flying is that by the time you have completed your private pilot training, you are really close to being as good as you are going to get unless you get it in your mind that you can get better, want to be better, and force some instructor to help you get better.

Some of our pilot evaluations end with the statement that the pilot we are flying with has reached their potential. That's not all bad. It simply means that they are through learning and that they have demonstrated this to us by the way they are reacting to the training program. I have actually never met a bad pilot. Quickly, let me qualify that statement. I have met some who could use more training, some who over the years of flying have developed some awful habits, and some who are just plain lazy. I have also met pilots who think the rules are made to be bent, and believe it or not, some who still fly and don't really want to.

Recurrency in itself need not be a chore, and it is something that you can do a lot of by yourself. The manoeuvres required to get your required certificates and ratings are the ones that you are supposed to remain proficient in forever, with an occasional update. Actually, the manoeuvres have gotten more graceful over the years as the examiners and the equipment have gotten older. It may require a little reading and there are excellent manuals out there to guide you through the process. Speak with instructors at your local airports, attend some seminars then go-up and practice your manoeuvres. Feel rusty? Get a buddy to go with you to a fly-in breakfast or some other aviation event. Change pilots on each leg and critique each other; be hard on each other. When you think that you are close to the top of your game, pick an instructor you think you might be able to put up with for an hour in the air, go fly and ask questions. Ask for a demonstration. And then ask more questions. Getting current is just the first step. Now figure out what you are going to have to do on a regular basis to stay that way...and do it.

You dedicated a lot of time and money learning to fly, and it would be a shame to neglect that significant investment. It was great fun then and it can happen again. Flying is a wonderful group activity, so get back together with some group and start doing all those fun things again. I fly with lots of people who have simply let their skills deteriorate from disuse. Don't let this happen to you. Recurrency is something that has to be done on a regular basis, and the only person who can keep up with your schedule is you. Are you current? Would you like to be? I'll see you at the airport! Always remember, pilots who don't fly have no advantage over people who can't fly. What's your excuse?

Checklist for Winter Flying

Adapted from Winter Flying Tips, *by Andy Rempert, Aviation Safety Inspector, Federal Aviation Administration*

Winter is just around the corner and you may want to enjoy the scenery, go ice fishing, visit a friend at a remote cottage, or fly to a lodge. Winter flying has a lot to offer, but brings with it conditions of operations somewhat different than in summer, and these have to be taken seriously. This is where Murphy's Law is at its best and can play-around with your safety. "What *can* go wrong…*will* go wrong." Daylight on a winter day is often shorter than anticipated. Weather can change quickly, and if you are not prepared to camp out in the wilderness every time you set out on a trip, you might be in for an unpleasant surprise, if you get caught by weather. Nights can be long and cold without a campfire and shelter. So you must be prepared.

A checklist is a must. I will review the basics that can help you develop your own checklist, the one that will be most appropriate for the type of operations that you are planning. Maintenance of the aircraft should be at its best; the aircraft structure and engine should have been inspected as per the inspection program that you have carefully developed to protect yourself, your investment, and to ensure the continued airworthiness of your aircraft. Here is a maintenance checklist that will confirm the airworthiness status of your aircraft and the readiness of a proposed flight in the wild.

Landing gear

Installation of skis: Inspect the skis and hardware; make sure that the cables and fittings are in good condition. Check the angle of incidence of the skis and the tension on the shock cord and make sure that the rear ski installation meets the requirements.

Replace the shock cords or any cables that are even a little frayed or worn. Check the ski bottoms for wear, and polish any rough surface, as it may contribute to ice or wet-snow build-up under certain conditions that may cause drag on takeoff or landing.

Wheels in a ski-wheel installation: Check the condition of the tires and the mounting hardware. Check the wheel hubs and the landing gear axle for cracks. Lubricate the wheel bearings with grease that will resist the cold winter temperatures and clean the wheel assembly.

Landing gear: Check the condition of landing gear struts, springs, mounting hardware and shock cords. Clean and lubricate the landing gear.

Wing Covers and Heaters

It is good practice to take along a set of wing covers to protect the wings from snow and ice build up. An engine heater will help get your engine to operating temperatures and reduce the wear and tear on engine parts as well as make it easier for your battery to turn your engine over for a good start in cold temperatures.

Wing Covers: Inspect all wing and fuselage covers for wear and tear. Repair as necessary. Replace any elastic shock cords that may be frayed or that show wear.

Space heaters: Check the condition and test the unit for proper functioning and efficiency. When preheating an engine, never leave it unattended.

Fire extinguisher: Check for weight of content, availability of charge under pressure (green indication) and certification. Why not have two available on board for safety!

Aircraft Equipment: Have a good knowledge of the overall condition of your aircraft prior to the first snowfall. Monitor any significant changes to the performance of your aircraft and its systems throughout the winter. Check the condition of the fuel caps and drains. Keep fuel tanks topped, as it reduces condensation in the tanks, which can lead to the formation of ice crystal and water that will clog your fuel lines and gascolator. Check your emergency locator transmitter (ELT) to make sure it is in proper working order, and make sure your batteries have not expired. It is also a good idea to take along a spare set of batteries. Check your oil cooler for leaks and cleanliness. Make sure that engine and cooler intake are restricted with the proper metal plates to prevent overcooling of the oil and the engine. Start your winter flying with fresh oil and new filter. Check for the proper function of your oil pan heater, if installed.

Winter Survival Equipment: As you are well aware, the *Canadian Aviation Regulations* (CARs) require that the aircraft be equipped with the necessary emergency equipment whenever a pilot ventures in an area isolated from any dwelling or town. This is to provide the pilot and passengers with the minimum survival gear necessary until rescue arrives on the scene of the forced landing.

CAR 602.61(1) states that, "No person shall operate an aircraft over land unless there is carried on board survival equipment, sufficient for the survival on the ground of each person on board, given the geographical area, the season of the year and the anticipated climatic variations, that provide the means for starting a fire, providing shelter, providing or purifying water and visually signaling distress." Subsection (1) does not apply to a balloon, a glider, a hang glider, a gyroplane or an ultralight airplane. It does not apply to an aircraft operated within 25 NM of an aerodrome when radio communications are maintained during the flight. Nevertheless, planning for an emergency is the best investment that you can make and consulting survival books and putting to good use some of the recommendations might change an emergency situation into a mildly uncomfortable, but very interesting outing. Know the enemies: 1) yourself, 2) injuries, 3) temperature, 4) disease. This list is not exhaustive but it is a good start. Your equipment must be able to provide you with the following: shelter, safety, warmth, ability to minimize injuries, food and signal.

Life Support Equipment: Collapsible Swede Saw, hatchet, axe, file, Vise-grip, slip-joint pliers, screwdriver set, light weight shovel (Snow shoes make good shovels). For the far north, a long saw or knife can help carve an igloo out of the hard packed snow. Large plastic sheet, 9 ft x 12 ft heavy gauge, coloured red or yellow. Small tent if possible. Waterproof matches, candle or fire starter, signal mirror, small compass, knife with multiple blades and accessories, insect repellent, mosquito net, whistle, 50 ft of 1/8 in. nylon rope and smoke flares. Camping supply stores are fully stocked with high-quality complex carbohydrate and protein vacuum-sealed or freeze-dried meal packages that are light-weight, will last for years and are very nutritious. Seal items in a small plastic bag and store them in a cooking pot.

Personal First Aid Kit: sealable plastic container, compress bandages, triangular bandage, roll of 2 in. tape, gauze pads, Aspirin, Advil, Band-Aids, razor blades, scissors, soap, purse-size Kotex, Kleenex, safety pins, small tube of antiseptic cream. We strongly suggest that you purchase an emergency kit from any one of the recognized national safety organizations.

Did you know that you can live without it approximately: Air: 3 minutes. Body shelter: 6 hours in severe weather. Water: 3–6 days. Food: 3 weeks. Will to live: Unknown?

Winter flying has a lot to offer. Be safe and plan your outings well. Be ready to say, "I'm not going today!" Remember, the more time spent preparing for a winter outing, the less time you spend worrying about it.

Explanatory note concerning Recreational Aviation *4/2003—Alberta, RAF Gyroplane Accident*

The RAF 2000 Gyroplane accident synopsis that was published in the Recreational Aviation section of ASL 4/2003 may have led readers to believe that the mishap occurred when manoeuvres performed were beyond those prescribed. This, however, was not the case. This very unfortunate accident occurred last January, and took the life of a well known and experienced pilot under circumstances that have been difficult to identify. To quote from the Transportation Safety Board (TSB) report A03W0015, "it could not be determined that [pilot-induced oscillation] was a contributing factor to this accident." We would like to apologize to the family of the deceased for the choice of words in the original article. —Ed.

How Low is Too Low? How About 60 ft?

On February 14, 2002, a Cessna 172L was on a VFR flight near Halifax, N.S., to conduct a natural gas pipeline patrol. The aircraft was flying along the Halifax lateral portion of the patrol when, at approximately 14:45, it struck a tree and crashed to the ground. Snowmobilers located the wreckage at 16:15 alongside the pipeline, approximately 31 mi. northeast of Halifax International Airport. The pilot, who was the sole occupant, was fatally injured and the aircraft was destroyed. This synopsis is based on the Transportation Safety Board of Canada (TSB) Final Report A02A0015.

Radar data showed that, on reaching the start of the Halifax lateral portion of the patrol, the aircraft descended to between 400 and 550 ft above ground level (AGL) and remained at that altitude until just south of Halifax International Airport. While transiting the Halifax control zone, the aircraft descended further and the remainder of the flight, which was captured on radar, was flown at altitudes between 150 and 450 ft AGL; the majority at altitudes between 150 and 250 ft AGL. At one point, approximately 7 NM northeast of the airport, the aircraft disappeared briefly from radar. Throughout this portion of the flight, the aircraft closely followed the pipeline track and terrain contours. The last radar return from the aircraft was when it was 19 NM northeast of the airport at an altitude of between 350 and 450 ft AGL, approximately 14 min prior to the accident.

The pipeline aerial patrols contract called for weekly aerial patrols at an altitude of about 1 000 ft AGL, or lower, at the pilot's discretion. The pilots who flew the patrols were trained to report erosion, damaged or missing signs or fences, open gates, and all activity by trucks, logging equipment, and all-terrain-vehicles. The aircraft operator reported that the patrols were normally flown at an altitude of 500 ft AGL. It is common practice within the industry to fly between 500 and 700 ft AGL.

The accident site was in a snow-covered, clear-cut area on the east side of the pipeline, just beyond a small grove of trees. The clear-cut area extends approximately 1 mi. back along the flight path before reaching a large uncut area of trees. The terrain is gently up-sloping from the uncut area of trees to beyond the accident site. The right wing, right wing strut, and right main landing gear tire struck the top portion of a spruce tree that was sticking up above all other trees and broke it off at approximately 55 ft AGL; even with the tops of other trees. The impact with the tree caused the right wing to separate from the aircraft. The aircraft then rolled inverted and travelled 547 ft before striking the ground in an 80° nose-down, inverted attitude. After impact with the ground, the aircraft flipped over and came to rest in an upright attitude, facing the opposite direction of flight. The tree impact damage on the right wing, right wing strut, and right main landing gear corresponds to a wings-level attitude at initial impact.

The pilot obtained his commercial pilot license in July 2001, and started working for the operator in October 2001. The accident flight was his 12th pipeline patrol since his pipeline patrol checkout on December 3, 2001. He had a total of 361 hr total flying time, of which 336 hr were in Cessna 172 aircraft.

Analysis—The aircraft was operating normally prior to impact and is not considered to be a factor in the accident. Also, there was no pre-existing physiological condition found that might have impaired the pilot's performance. Radar data showed that the aircraft was flown along terrain contours at altitudes well below those required for effective observation. The aircraft was flown consistently below 500 ft AGL, and recorded on radar as low as 150 to 250 ft AGL. When the aircraft struck the tree, it would have been only 55 to 60 ft above the ground.

The aircraft was in a wings-level attitude when it struck the tree. This tree was sticking up above the others, but may have blended in with trees in the background. This could explain why the pilot did not see the tree and take evasive action to avoid it, or his attention may have been focussed on observing the pipeline to his left. The TSB concluded that on this flight, the pilot consistently flew the aircraft below the required altitude for effective observation and inadvertently struck a tree. △

Scrutinizing Aviation Culture: Professional Courtesy

I recently encountered the term “professional courtesy” in an aviation safety context, and decided to research the subject. As expected, the term reveals many different interpretations, depending on which industry you apply it to. In the medical industry, professional courtesy is used to describe a number of analytically different practices, but the traditional definition is the practice by a physician of waiving all or a part of the fee for services provided to the physician’s office staff, other physicians, and/or their families. In a court of law, where the practice of law is largely an adversarial process, attorneys are ethically bound to observe certain standards of professional courtesy between their peers.

However, “professional courtesy” does not seem to be unique to medical and law circles. I encountered the expression while reading an account of the March 10, 1989 crash of an F28 at Dryden, Ont. in *Air Disasters, Volume 3* by MacArthur Job. The synopsis addresses the crucial minutes that preceded the final takeoff in a section entitled “Other crew and passengers concerns.” It struck me as material worthy of an article for ASL. However, before going any further, perhaps the new cross-section of our readers aren’t so familiar with the Dryden accident, so here’s a quick recap of what happened, as described by the *Aviation Safety Network* Web site (www.aviation-safety.net):

On March 10, 1989, at 11:55 EST, an Air Ontario Fokker F28 departed Thunder Bay about one hour behind schedule. The aircraft landed at Dryden at 11:39 CST. The aircraft was being refuelled with one engine running, because of an unserviceable APU[auxiliary power unit]. Although a layer of 1/8-1/4 in. of snow had accumulated on the wings, no de-icing was done because de-icing with either engine running was prohibited by both Fokker and the operator. Since no external power unit was available at Dryden, the engines couldn’t be restarted in case of engine shutdown on the ground. At 12:09 CST, the aircraft started its take-off roll using the slush-covered Runway 29. The Fokker settled back after the first rotation and lifted off for the second time at the 5 700 ft point of the 6 000-ft runway. No altitude was gained and the aircraft mushed in a nose-high attitude, striking trees. The aircraft crashed and came to rest in a wooded area, 3 156 ft past the runway end and caught fire. Twenty-four of the 69 people on board died as a result of the accident. PROBABLE CAUSE: After a 20-month investigation, it was concluded “Captain Morwood, as the pilot-in-command, must bear responsibility for the decision to land and take off in Dryden on the day in question. However, it is equally clear that the air transportation system failed him by allowing him to be placed in a situation where he did not have all the necessary tools that should have supported him in making the proper decision.

The Dryden accident investigation was carried out by a Commission of Inquiry, headed by the Hon. Virgil Moshansky, a Justice of the Queen’s Bench of Alberta. The Final Report of the “Moshansky Commission” consists of four volumes and a total of 191 aviation safety recommendations. This was to be the most comprehensive aircraft accident investigation in Canadian history; while today this claim may be held by the investigation into the Swissair Flight 111 accident, the Moshansky Commission had a wider mandate to investigate the entire aviation system and what allowed the circumstances surrounding the Dryden occurrence to exist. Without a doubt, those four volumes are a landmark in aviation safety in Canada, and a must-read for anyone interested or involved in aviation safety. The 191 Moshansky Commission recommendations have led to sweeping changes in the way we conduct aviation business in our country. Now back to the original topic…how a modern cultural mindset could have prevented the tragic accident in March 1989.

Moments before takeoff, the F28 was taxiing out for the final takeoff with significant amounts of snow visible on the wings, and while a flight attendant and two airline captains traveling as passengers noticed, this was never communicated to the pilots. The flight attendant, who was the only crew member to survive, testified later that she had concerns over the snow, but because she had been rebuffed by company pilots over a similar situation in the past, it influenced her decision not to go to the cockpit. This cultural barrier between cockpit and cabin crew should never happen today, given how we train and conduct proper Crew Resource Management.

While the silence of the flight attendant was disturbing for the Commission of Inquiry, the Air Disasters synopsis spells out the thoughts on the two airline pilots:

In the case of the two airline captains traveling as passengers, their lack of affirmative action was unfortunate—to say the least. As professional pilots, they had a clear understanding of the danger, and their indication of concern would at least have been considered by the usually meticulous Captain Morewood.

The reason why they did not raise their concerns differ, but there are two points on which they agree—both assumed the crew was aware of the condition of the wings, and both believed the aircraft was going to be de-iced.

While taxiing away from the terminal and backtracking on the runway, the DC-9 captain thought they were proceeding to the more remote de-icing area on the airport. This was a reasonable assumption as Air Canada often de-iced its DC-9 aircraft at locations remote from the gate. There was no doubt in his mind, he recalled, that the aircraft had to be de-iced before takeoff.

The Dash 8 captain knew the de-icing equipment at Dryden was on the apron near the terminal, and expected they were going to return there. If the aircraft was not de-iced, he believed the takeoff would be aborted should the snow not come off the wings during the take-off run [a highly dangerous practice in itself]. He also indicated that "professional courtesy" precluded an off-duty airline pilot from drawing the attention of the flightcrew to a safety concern.

The inference was that "professional courtesy" among pilots was more important than safety, suggesting an unwritten code that militated against such communications, even when a potentially life-threatening concern was involved.

Other factors could influence an off-duty airline pilot not to make known his concerns: faith in the professionalism of the duty crew; fear of offending and possible rebuke for unsolicited advice; fear of embarrassment if the concern proved groundless; and a reluctance to interfere in the busy flight deck workload.

Whatever the reason, the evidence before the Inquiry pointed to a general reluctance on the part of the cabin crew and off-duty pilots to intervene in the operation of an aircraft, even in the face of apprehended danger.

The Commission believed air carriers should counsel their pilots that not only was it acceptable, but indeed expected, that off-duty airline pilots on board should draw any perceived concerns to the attention of the captain. Considering the complexity—and size—of jet aircraft today, a flight crew could only benefit from the eyes and ears of all on board, especially from those possessing pertinent skills.

MacArthur Job, Air Disasters, Volume 3*, page 62*

I'll be the first to admit that it takes a lot of nerve for an off-duty pilot to step out of the passenger mentality and speak out in the manner described above. Fortunately, operational mindset changes in today's aviation industry have, in large part, taken care of this cultural pickle. Crewmembers now understand such advice as totally acceptable and expected. This is the right way to do business. In fact, those extra eyes and ears in the background have turned "professional courtesy" into a potential lifesaver, as opposed to a missed opportunity to avoid a tragedy.

Have You Heard About TP 14052E, the NEW Ground Icing Operations Update?

A new Commercial and Business Aviation document was recently released by Transport Canada (TC), Civil Aviation to inform air operator personnel of recent developments and issues pertaining to aircraft ground icing operations. In the past, a *Commercial and Business Aviation Advisory Circular* (CBAAC) was issued during each winter operating season. It contained both reference information related to ground icing operations and the *Holdover Time (HOT) Guidelines*. A decision was made to do away with the annual CBAAC on this subject and replace it with two documents. The first document, TP 14052E—*Ground Icing Operations Update*, includes reference material related to ground icing operations. The second document, the *HOT Guidelines*, is available on the Web. A significant benefit of having this stand-alone publication is to allow the annual publication of the *HOT Guidelines* separately, without having to re-issue the general information section. The operational benefit of this is to have accurate and timely *HOT Guidelines* available before the winter operating season commences. This allows operators adequate time to incorporate the requisite information into their respective ground icing programs and conduct the necessary training. All previous CBAACs on the subject of ground icing updates are superseded; the most recent on this subject was CBAAC #0194R, dated September 20, 2002. TP 14052E and the Winter 2003-2004 *HOT Guidelines* are easily accessible at: http://www.tc.gc.ca/CivilAviation/commerce/HoldoverTime/menu.htm. If you have any questions or comments regarding the above, please contact Doug Ingold at INGOLDD@tc.gc.ca.

to the letter

Overloading

Further to the article regarding overloading in ASL 2/2003, I wanted to add what I believe should be an item of discussion for pilots who fly rental aircraft—and for anyone who flies multiple aircraft of the same type—as the practice of calculating weight and balance can fade quickly after your flight test.

For the last few years, I have been flying a single type of vintage aircraft (50+ years old), but four different individual aircraft. Soon after I began flying these aircraft, I became well aware of each airplane's individual and unique characteristics and that "all aircraft are not made alike." To make a long story short, as one might expect, each aircraft has its own unique weight and balance data. I have done a basic weight calculation with full fuel and my weight (theoretically a constant), and figured out my useful loads for each aircraft. It is very difficult to exceed the gross weight for this particular make of aircraft and most of the outdated and heavy tube radios, etc. (originally located near the baggage box) have been replaced with lighter-weight equipment. I also did the balance calculations and found something I was unaware of. For three of the four aircraft, everything (both weight and balance) is within the published limits for all occupant and fuel configurations, but for one particular aircraft, if I fly solo with full fuel tanks, I must fly with 10 lbs of baggage ballast to keep the centre of gravity (C of G) within the specified limits. If I fly solo with fuel tanks 3/4 full, or with the rear seat occupied, all calculations indicate that I am within the "envelope."

I was quite surprised and have since checked the Cessna rental fleet that I also occasionally fly. If some of the readers of this letter check out their own scenarios, they might just be surprised at how close (and maybe over) the limits or "outside the envelope" they may be. It may apply for one aircraft and not another. If you are overweight or outside the C of G limits, this invalidates the certificate of airworthiness (C of A) or flight authority. From a practical standpoint, you might think that it really doesn't make any difference, but…

Greg Burnard
London, Ontario

We should all heed your excellent advice, Greg. Thank you. —Ed.

Arrival at uncontrolled aerodromes

I always read the ASL from cover to cover, and on page 14 of issue 4/2003, the letter "He's just a trainer and were an airliner" brought to mind an incident that happened to me only a few weeks ago. A friend and I were returning to Qualicum Beach, B.C., after a local VFR sightseeing flight. The recommend VFR approach is to turn over French Creek at 1 200 ft ASL, fly directly overhead the runway centreline and determine wind direction and runway selection. At 5 mi. out, we called our intentions to land, and did so again over French Creek. A Piper Cub was also inbound from the north, and we determined spacing: us as number one and the Piper Cub as number two, both crossing mid-field to join downwind left for Runway 29. As I came across the runway centre, I called ahead my upcoming turn for left downwind Runway 29, and the Piper behind us called at French Creek as number two, also for left downwind Runway 29. The next voice over the radio was a Cessna 210 broadcasting his intentions to join direct downwind for Runway 29. I called the C210 and asked him for his position, which he stated as 3 mi. southwest at 1 400 ft. We began scanning the horizon for the C210, which turned out to be 200 ft above us, descending to 1 200 ft and off our right wing. I quickly called the C210 and warned him of the lack of appropriate spacing, told him he was too close to us and that there was a Piper Cub behind. I told him of the recommended VFR approach over French Creek and that he needed to execute a right turn immediately to avoid a collision with us, as well as possible circuit interference with the Piper behind us. His response was sobering as he snapped at us angrily, "I'm perfectly within my rights to join directly onto the downwind leg, I know my rights." My response was now a little more urgent, "You are in conflict with circuit traffic and unless you turn immediately, a collision is imminent, Sir!" Almost immediately he began a right turn away from us. The pilot of the Piper Cub then called his intentions and his voice was as upset as mine. I was finally able to turn downwind after I was positive the C210 had turned away. By my determination, if somehow the C210 had managed to squeeze between us in the circuit, he could have easily hit us from behind. The next day, I talked to a flight instructor at our local flight school about this pilot's arrogance and lack of concern for his safety and ours. We clearly had the right of way, but that wouldn't matter much if you were dead!

This type of attitude came from an experienced pilot in a high performance Cessna 210 RG, cutting off not one, but two aircraft already established in the circuit and in sequence for landing. He put the fear into both of us, and hopefully he will read this and learn something.

Mark Fisher
Qualicum Beach, B.C.

Thank you Mark, this is a HUGE and FREQUENT problem for all pilots to mull over. On the "right" to join downwind, A.I.P. RAC 4.5.2 clearly states:"Alternatively, once the pilot has ascertained without any doubt that there will be no conflict with other traffic entering the circuit or traffic established within the circuit, the pilot may also join the circuit on the downwind leg." *Clearly, in the above scenario the C210 did not do this. The A.I.P. section further states:*"All descents should be made on the upwind side or well clear of the circuit pattern." *Pilots joining downwind should therefore be at circuit altitude well ahead of* *time. We've often heard of "road rage" but it sounds like we are now facing "airspace rage." It seems like there is an urgent rush for some pilots to bully their way into the circuit and land as soon as possible. We should all realize that operations at uncontrolled aerodromes require the highest degree of courtesy, airmanship and self-control. The three to five minutes saved are never worth it, and one day this reckless attitude will catch up with whomever practices it.*

Finally, I must address the little note in the same section of the A.I.P. which states: "Some pilots operating under VFR at many sites prefer to give commercial IFR and larger type of aircraft priority. This practice, however, is a personal airmanship courtesy, and it should be noted that these aircraft do not establish any priority over other aircraft operating VFR at that aerodrome."

I recommend you acknowledge this A.I.P. text, which ultimately requires common sense and, as we discussed earlier in this issue, professional courtesy. This does not apply to the story above, but more so to the letter referred to from page 14 of issue 4/2003. Clearly it is not good airmanship to prevail yourself of your right-of-way if you impose a significant and potentially dangerous low-level manoeuvre on a large passenger-carrying aircraft coming on a stabilized approach. Notwithstanding the provisions of circuit procedures and CAR 602.19 on Right-of-Way (also found in A.I.P. RAC 1.10), a basic principle is to consider giving way to larger and less manoeuvrable aircraft. —Ed.

MANOPS cleared…

In ASL 4/2003, in response to a letter concerning the use of the words "cleared" and "clear" in ATC air/ground communications, the ATC Manual of Operations (MANOPS) was quoted on a section as applicable to "ground vehicles" only. The reference, MANOPS 303.2, now includes aircraft as well as vehicles, and states: "Do not use the word "cleared" in conjunction with authorizations or instructions for aircraft to taxi or for equipment, vehicle or personnel operations." Mr. Arthur van Maurik may have gotten the wrong impression.

Jim Savage
Cornwall, Ontario

All clear now! Thank you Jim! —Ed.

The ASL Interview—Mike Doiron continued from page 16

have known that anything had gone wrong because there was no damage, no physical occurrence, just a close call. The enlightening part of this is that through this self-disclosure we found that in most of these instances we had to change either a procedure, a policy or a practice we used around here.

The end result is that not only did this person learn from their mistake, but also the lesson learned was passed on to everyone else in the organization, so that the mistake doesn't reoccur. To me, the key to a Safety Program is not the fact that you figured out what went wrong after you broke the thing, it's figuring out what can go wrong, to help you prevent breaking it in the first place. So the no blame culture is, I feel, the key ingredient of that whole exercise, in the fact that people are not afraid to come and speak up. On several occasions, I've had people come directly to my office and tell me that they had an occurrence; what we do at that point is a full-blown investigation as if we were investigating an accident. We simply want to try to figure out what went wrong. The simple fact of the matter is that this person did not do this on purpose.

There is an underlying cause as to why they committed that error and we have to figure out what that cause is and, if it's a system deficiency, we fix it.

I must point out that a "no blame" culture does not mean that everyone gets away with whatever they want. We do have very clear policy and guidelines as to what is included in the "no blame" culture. When you get right down to it, there are only three things that we would take disciplinary action for, and they are negligence, criminal intent and substance abuse of some kind.

ASL: Do you believe that your organization possesses a strong safety culture?

M.D.: I think so, because it is ingrained right from the beginning. Our new students begin learning immediately in their briefings the importance and proper use of manuals, Standard Operating Procedures, how and why we have a SMS program, and the introduction to the "no blame" culture—essentially what makes us tick as an organization. The emphasis from day one is a safe operation within the organization.

ASL: How do you do that? How do you get people to think safety?

M.D.: Actually we don't get them to think safety; we simply make them understand that "this is the way we do business." I think what has to happen really, is that people must think safety without realizing they are.

ASL: In your opinion, what are some of the benefits that have been realized since implementing a SMS program at MFC?

M.D.: We started the program five years ago and honestly, it's still under development, as we keep fine tuning it every day. Financially, we estimate that over the last 4 years we have saved annually anywhere from \$20,000 to \$25,000 as a result of our SMS program. These numbers are significant and anyone who knows the margins in flight training would agree that it's not bad at all. Another bonus is that in spite of increasing insurance rates, our increases have been quite minimal. Our insurers ask us how we do this, and how we keep our accident rate so low. Over the last four years we have had in the vicinity of 85 000 hr of operations in flight training, with probably half of those hours being with pilots with under 200 hr of flight experience. Of these 85 000 hr, we've had two collapsed nose wheels due to hard landings on the part of students. In short, if your SMS is simply how you do business, it's not an extra and never gets dropped. △

The ASL Interview—Mike Doiron, Principal and CEO, Moncton Flight College

by Edgar Allain, Civil Aviation Safety Inspector, System Safety, Atlantic Region

Mike Doiron started flying in 1972 and became a Class I instructor, Designated Flight Test Examiner (DFTE) and Chief Flight Instructor (CFI). He joined Transport Canada (TC) in 1979 as a Flight Training Standards Inspector and held various positions, including Regional Superintendent of Flight Training Standards and 12 years as the Atlantic Regional Manager of System Safety. Mike's background is strongly concentrated in Instructional Technique, Safety Management and Human Factors. In May of 1998, Mike left TC to become Principal and Chief Executive Officer (CEO) of the Moncton Flight College (MFC).

ASL: Mike, what is your official title and how do you fit into the structure of the organization?

Mike Doiron (M.D.): I am the [CEO] and Principal of the college. I report to a board of volunteers, because the Flight College is a not-for-profit organization. Effectively all decisions on the day-to-day operations are made from my office.

ASL: Could you give us an overview of the programs offered at MFC?

M.D.: MFC offers courses at two different levels; at the *ab initio* level, Private and Commercial Pilot Training, and at the college level, a two year Diploma Program.

We also have an advanced portion of MFC, which we call "MFC Pro Select" which deals with King Air 200 training for corporate operators, and advanced courses such as the Safety Management System (SMS), Crew Resource Management and other courses in those fields.

ASL: How many instructors do you have? How many aircraft do you operate?

M.D.: We have 26 flight instructors, including eight senior Class 1 and Class 2 instructors. We are in the process of a complete fleet renewal. We purchased six Diamond aircraft and are slowly replacing our Cessna 172s. We also have a Citabria that we use for upset and aerobatic training, and two Piper Seminoles for multi-engine and IFR training.

ASL: Can you describe your SMS program for us?

M.D.: MFC has a comprehensive SMS program, which incorporates numerous facets. The key is that we have Graham Sheppard as our full time Standards and Safety Officer (SSO). His role within the organization is to manage the SMS program. He does initial investigations, initial occurrence reports and so forth. We also have within our maintenance department a "Quality Assurance Manager" by the name of Ian Albert. Both Ian and Graham work together on any maintenance or flight operations issues, which may have cross-ties between the two departments. While the SMS program is managed by our safety officer, it effectively remains my responsibility, as I'm a firm believer that whoever runs the place is ultimately responsible for safety.

ASL: What can you tell me about your safety committee, its membership, frequency, etc?

M.D.: We hold monthly safety committee meetings. I am the co-chairperson, with Jason Meunier, who represents our employees. All managers report to the safety committee itself, whereby all the various components of our SMS program flow through the committee at one time or other. This includes the confidential reporting system, incident reports, OSH [Occupational Health and Safety] issues, operational and maintenance issues and processes. We also have representatives from our Quality Assurance Department, our employees and our students. The student participation consists of two or three students from our senior year, because they have already received the full SMS course as part of their training. This gives them a much better appreciation of a SMS program in an operational setting. Having students on the team who are trained in safety management has proven to be a really effective tool because they not only see issues from the eyes of the student, but they are also often approached by fellow students. At the meeting, we review the occurrences from the previous 30 days, and we discuss and/or action items from previous meetings. The safety committee has final say on whatever action has been taken. So even though an investigation was carried out and fixes put in place, an event is never considered closed until the safety committee approves the actions taken.

Graham Sheppard (left), MFC's Standards & Safety Officer, and Mike Doiron.

ASL: Earlier you had mentioned an anonymous reporting system. Can you explain how you give feedback in such a system?

M.D.: The interesting thing is that we have had an anonymous reporting system in place for about three years and have never used it because people put their names on the sheets and they are not afraid. This, I think, comes from our "no blame" culture. We have been very adamant about the fact that errors occur and that it is an issue of error management and error identification. We've had probably at least a dozen times where someone would come up to us and say: "boy I messed up" and here's what happened. The interesting thing is that in most of these cases, if they had not reported upon themselves, we never would

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TAKE FIVE...

for safety

Five minutes reading could save your life !

TIME IN YOUR TANKS…

Finding the “time in your tanks”…

- Log accurate flight times, power settings and fuel used on each trip.
- Count flight time as startup to shutdown.
- Compute fuel consumption (per hour) after a few flights under similar operating conditions.
- Determine usable fuel from pilot’s operating handbook (POH).
- Ensure proper conversion for units used: (imp gals to litres; US gals to litres; pounds to litres). Conversion charts can be found in the CFS.
- Your safe flight time limit is:

$$\frac{\text{Usable fuel x 3}}{\text{(Fuel units)/hr}} = \frac{\_\_\_\_\_}{\text{x 4}} \text{ hrs (resolve never to fly longer)}$$

- In flight, compute fuel used:

$$\frac{\text{(Fuel units)/hr x min flown}}{60} = \_\_\_\_\_\_ \text{ (fuel units) used}$$

- If fuel gauges do not agree with computed (fuel units) used, suspect inaccurate readings or a loose fuel cap.

Fuel management checklist

When computing a safe flight time limit for your flight, consider:

- Trip length
- Cruise altitude
- Engine power settings
- Wind (don’t count on forecast tailwinds)
- Regulatory and company fuel reserves
- Number of passengers and load
- If <u>actual</u> flight time progress lags behind <u>planned</u> progress you may have to land short of destination
- Use the proper grade of fuel; colour check fuel grade when refuelling; if proper grade unavailable, use the next higher grade. (Always refer to POH)
- Draincock check for water and fuel cleanliness
- Visually check quantity before startup, preferably using an accurate dipstick
- Know the fuel system—especially the tank selectors
- When selecting fuel tanks don’t rely on feel alone—look. Don’t reposition fuel tank selectors just before takeoff or landing.
- Get familiar with mixture control…

Mixture control

- A proper mixture control gives:
  - improved engine efficiency
  - fuel economy, and longer range
  - reduced maintenance costs, longer sparkplug life, less fouling
- Use the engine builder’s vast experience—consult the POH


So Chuck, we need to take everything in one trip, because we have an important meeting at 10...
Well, euh...but... we may be overweight you know?
Come on Chuck, you've done it before!
Yes but... you know... well...OK
Chuck is such a great pilot, and so understanding.
I hate this client... always asking for more.
Hum..hum Chuck, these trees seem pretty high...and CLOSE!
Sure, now you get it.
BOOM!
Yeah...right.
Damn you Chuck - we could have done two or more trips you know!