Transport Canada Safety and Security | Transports Canada Sécurité et sûreté

Aviation Safety Letter

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Learn from what others are doing right... **Issue 1/98**

Twenty-Five Years of Safety Promotion

The first issue of the *Aviation Safety Letter* appeared in the spring of 1973 in English.

To the best of our recollection, John Richards, then Chief of Safety Promotion for Transport Canada Air, originated the concept of a publication dedicated to promoting aviation safety. On a rotating basis, Andy Triolaire, Vern Venholla and Mike Tyler shared the duties as the first ASL editors. They were followed by Ross Elliot, in whose honour the Ross Elliot Memorial Award was later created to recognize excellence in the promotion of aviation safety in Transport Canada. Then, in turn, came Bill McLaughlin, Diane Rothberg, Wayne Ralph, Hugo Leech (briefly) and, in 1992, yours truly.

By the fall of 1973, distribution had been widened to include all 30,000 Canadian licensed pilots. By Issue 3/77, we had added the logo "*Learn from the mistakes of others; you'll not live long enough to make them all yourself...*" to our banner. In 1994, we changed that logo to "*Learn from what others are doing right...*" to put a more positive spin on things.

However, the aim of the ASL has not really changed over the years. We have tried to convey

Transport Canada Air | Transports Canada Air

AVIATION SAFETY letter

Number 1

Something old, something new...

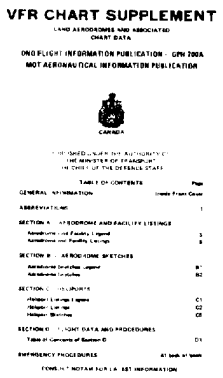
For about a year now we have been hinting that changes are coming... with this issue we're introducing a few.

You will note from the appearance of this package that aviation safety material has been added to the traditional aircraft accident reports. This material will be produced by the Aviation Safety Division, whereas in the past the Aircraft Accident Investigation Division has been the publisher. Our two agencies work hand-in-hand; from investigations we will be deriving much of the information for the Letter.

Our free subscription service is now approaching 10,000 - a substantial increase over the last year or so, We'd like to think that this is heartening evidence of your interest in "safety" - or put another way, "getting the most out of your flying by doing it the safe way".

We'd like to thank those of you who took time out to respond to our earlier request for commentary about the quality of training. We haven't been able to answer everyone although it's our intention to make a stab at it as soon as we can.

VFR Flight in Terminal Areas


VFR CHART SUPPLEMENT

From time to time we receive reports from ATC that pilots on VFR flights have flown into or through positive control zones (terminal areas) without clearance. These zones are areas of high traffic density and as an unexpected arrival, you could be endangering yourself and others by a midair collision. Some VFR pilots may be unaware of these zones, or are unfamiliar with the procedures for entry into, or through them. Good preflight planning will alert you to this hazard; to help you in this, we suggest you get "VFR Chart Supplement". This compact MDT publication contains amongst other interesting items, the special VFR Terminal Areas Procedures. It is updated every 84 days and the annual subscription is $4.00.

For your copy write to:

Canada Map Office
Dept of Energy, Mines & Resources
615 Booth St
Ottawa. K1A 0E9

Going from Harrington Harbour to Haliburton Highlands? They're both in the VFR Chart Supplement.

Air pockets and downdrafts

Airspeed or lack of it? How about "downdraft"?

Having laid to rest the myth of the "air pocket", the downdraft has emerged to take its place. In earlier years we ascribed the cause of many accidents

Canada

to the aviation community the safety insights gained from a wide variety of sources.

We have endeavoured to entertain as well as inform, to make the stories readable and to make the potential lessons acceptable. The contents have frequently dealt with people's misfortunes, and we have tried to keep the reader's sensitivities in mind. The keys to subtly discouraging unsafe attitudes and practices, however, have not always been easy to find.

We have tried, not always successfully, to pay careful attention to the manner and tone in which the sensitive subjects associated with accident/incident experiences are presented. On occasion, readers have had to keep us honest.

Editorials have been used to stimulate you, the readers, to submit letters to the editor to ensure that you feel that the ASL is your publication, and to make it a forum for the discussion of system inadequacies that might not otherwise be revealed until an accident has occurred. While accident articles were factual, the editorials and letters to the editor have expressed opinions and aired viewpoints in the whole aviation community. The contents of the ASL have not necessarily always reflected official policy, regulations or directives.

We have tried to use the language of the industry (pilot talk) — the acronyms, the slang — and occasionally a little humour.

Over the past twenty-five years, the ASL has grown to a total distribution of about 65,000, including all Canadian licensed pilots and a significant international mailing list.

To celebrate, we are republishing some stories from the past. You may note that many of the topics raised are still current issues — could it be a case of new people making the same old errors?

As you read this, after five years at the editorial helm, I have already departed the ASL to return to flying full time. It was an enjoyable run, and I will miss it.

Adieu, and fly safe,
Leif Schonberg

From Issue 5/74

We have a short message to pass along from the Aircraft Accident Investigation Division. As most of you are aware, an aircraft accident must be reported as quickly as possible to the Ministry. If it happens on a weekend, don't wait until the Monday to report it; investigators are on 24-hour standby. If you have to report an accident, you can contact the Regional Office directly or through the ATC system or the local police.

For more information on reporting procedures, look in the VFR Chart Supplement and Air Regulations Sec.826-830.

Delaying a report might allow evidence to be lost, evidence that might later save a life or two.

ELT Teething Problems

A reader sent in his story of how his aircraft, parked on a grass strip, recently became the object of an ELT search. Unknown to him, his ELT had been activated and was transmitting. We can imagine how he felt when a search aircraft appeared overhead and zeroed in on his downed aircraft. His aircraft was fitted with an ELT operated by a cockpit remote control switch. This switch has three positions: OFF/ARM/ON. The aircraft had been parked with the switch in the ARM position. Apparently someone had momentarily switched it to the ON position, activating the ELT, and had returned the switch to ARM. Once activated, it must first be placed in the OFF position to shut off the transmissions before it is returned to the ARM position.

These false alarms can be prevented by turning your ELT switch to the OFF position before you leave the aircraft. Leave the switch in the ARM position only in flight. It's a good idea to put these items in your pre-start and shutdown checklists now.

What about ELT false alarms from aircraft without an ELT cockpit remote-control switch? In these installations, the ELT control switch is on the ELT itself located to the rear of the aircraft. These aircraft are always flown and parked with the switch in the ARM position. Unknown to you, the ELT may have been activated by a hard landing, by movement of the aircraft on the ground, or by maintenance people working on the aircraft. To ensure that the ELT is not transmitting, listen out on 121.5 before shutting down.

If you hear an emergency squawk, check the switch on the ELT in the rear of your aircraft. This may necessitate opening an inspection panel. Turn the switch to the OFF position, return to the cockpit and again listen out on 121.5. If the ELT tone is gone, then your ELT was the culprit. Now go back and reset your ELT switch back to the ARM position and you should be ready for your next flight. Your ELT is now armed but not transmitting. Go back to the cockpit and make a final check on 121.5.

ELT Urgent Problem

As we go to print, there have been another two ELT false alarms! One involved a Cessna 172 parked at Maple Airport and another a Cessna 172 on floats docked on a lake in the Kenora area.

Each aircraft was located by search and rescue aircraft in less than three hours and the

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The **Aviation Safety Letter** is published quarterly by the Safety Programs Branch, System Safety, Transport Canada, and is distributed to all Canadian licenced pilots. The contents do not necessarily reflect official policy and, unless stated, should not be construed as regulations or directives. Letters with comments and suggestions are invited. Correspondents should provide name, address and telephone number. The ASL reserves the right to edit all published articles. Name and address will be withheld from publication at the writer's request.

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

pilots were advised that their ELTs were transmitting. *It's vital that you make that ELT listening-out check on 121.5 every time that you shut down.*

Fuel Tanks – AVGAS Water Contamination

Getting airborne was easy. It was the forced landing 15 min later that sent the adrenalin flowing into this pilot's blood. "At the first sign of rough running, carb heat seemed to work...then I lost all power except a very faint idle. I picked out a field and made a forced landing." The next day, they found ice in the fuel filter and sediment bowl; in fact, the wing-tank drains were frozen and there was ice in the bottom of both tanks.

The aircraft was parked on the ramp throughout the winter. After most flights, it was left with fuel tanks less than half full. On this aircraft type, as on many others, the fuel caps are recessed below the wing surface, leaving space for the collection of rainwater. Removal of the cap without first drying out this recess would permit water to dribble into the tank. In addition, the tank cap seals were in poor condition. The night before the incident, the aircraft had been towed into a heated hangar for repairs and by flight time it was thawed out. The rapid change in temperature and exposure to the elements resulted in a build-up of water from condensation and seepage. After refuelling, the stirring action in the tanks will put the water in suspension; before draining the sumps, wait a few minutes for any water to settle.

From Issue 3/75

'Run way Lights in Sight. . . "

Last year, 97 people were killed when a 707 entered a particularly steep rate of descent in the last 20 seconds of an instrument approach. As the runway became visible, the first officer called "you're a little high," and so the captain increased his rate of descent from 690 fpm to 1470 fpm. This excessive descent continued until the aircraft crashed.

Why? The captain had relied primarily on visual clues. The heavy rain on the windshield may have caused the runway lights to appear larger, thereby convincing the pilot that he was closer to the runway than he really was.

"Runway lights in sight..." is a reassuring call from the first officer, but it means that you're entering a critical phase of flight. That transition from instruments to the visual part of the landing requires more than just a casual check of the flight instruments. Your instrument scan should continue, with visual clues (such as VASI) added to it as they appear. This way, during transition, you'll detect any deviations from the glide path and desired rate of descent.

Having some visual clues may tempt you to abandon your instrument scan early, but rain on the windshield changes the perception of distance on the approach. It can make lights appear larger, which may convince you that the runway is closer than it really is. With this illusion, it's easy to convince yourself to increase the rate of descent or descend prematurely. Or rain may cause runway lights to appear less intense by diffusing their glow. This would probably lead you to think that the lights are farther away than they actually are.

Don't fall into the visual trap. Maintain a good scan of your flight instruments as you transition from the instrument phase to the visual approach and landing.

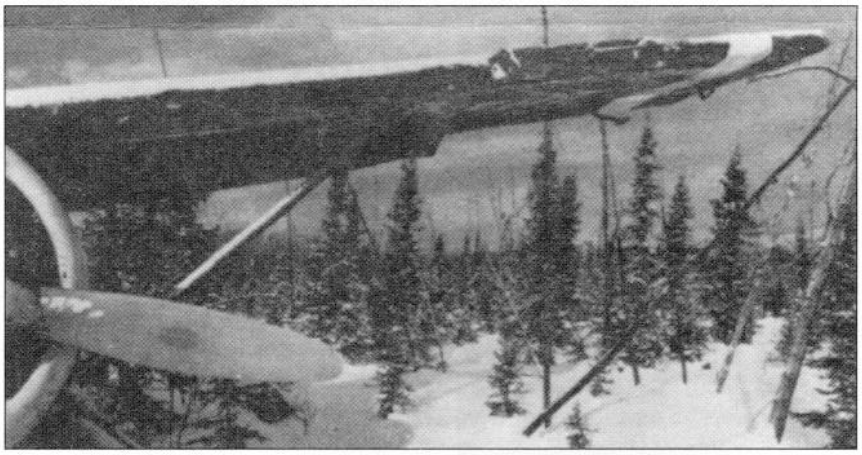
The Mirror Effect

Have you ever looked into a wall-to-wall mirror and wondered exactly where the surface was? Hard to tell, isn't it? It's the same thing when taking off or landing on glassy water.

Ask any experienced float pilot — glassy water operations are tricky and you need to be extra alert. Here's an example. After refuelling on shore, a chopper pilot moved to a hover over a glassy lake surface. As he began his transition to forward flight, the skids struck the water surface, causing the chopper to tumble into the water. Fortunately, the crew escaped uninjured as the chopper was sinking.

The pilot said he had never been instructed on the hazards associated with glassy water operations. Have you? There is more information on this subject in Part 4 of the *Flight Information Manual* (FIM).

From Issue 6/75



There's a school of thought that says "you can't avoid having accidents," and we must admit that statistical evidence seems to be on its side. But a close look at accidents reveals that few, if any, ever needed to take place.

It's our firm opinion that assuming the inevitability of accidents saps the positive thinking of those who are in the best position to prevent them. Persons involved in accidents sometimes reveal a startling lack of appreciation for this fact. You'll hear that "some kinds of flying are dangerous; you only have to look at the accident record to see that!"

Take the pilot who lands a small ski-equipped cargo plane at a remote frozen lake. On landing, he discovers that the surface is, quite slushy and that he has picked up a fair amount of the stuff during the landing roll. He unloads his cargo, kicks off the accumulation around the skis and sets out for the takeoff. On his first attempt, he gets nowhere, and so he decides to use the landing tracks. This time, things go a little better, but acceleration is still poor. With only 250 to 300 yd. of lake remaining at 40 mph, "I elected to carry on and obtain 50 mph and rotate...." Inasmuch as there was a shoreline and trees at the end of the lake, that attitude took some self-control! The aircraft became airborne for a short distance but was so close to the stall that the aircraft wouldn't accelerate. The inevitable happened and the aircraft crash-landed into trees.

It was the pilot's contention that "I honestly don't know how this could have been avoided in this situation...." And he's right. The problem is that what the pilot meant by "situation" was the compelling urge to make good a takeoff run that obviously wasn't going well, and indeed, to attempt a takeoff in conditions like that in the first place. Certainly there was pressure to get the aircraft out, but, as it happened, it stayed there for quite a while longer.

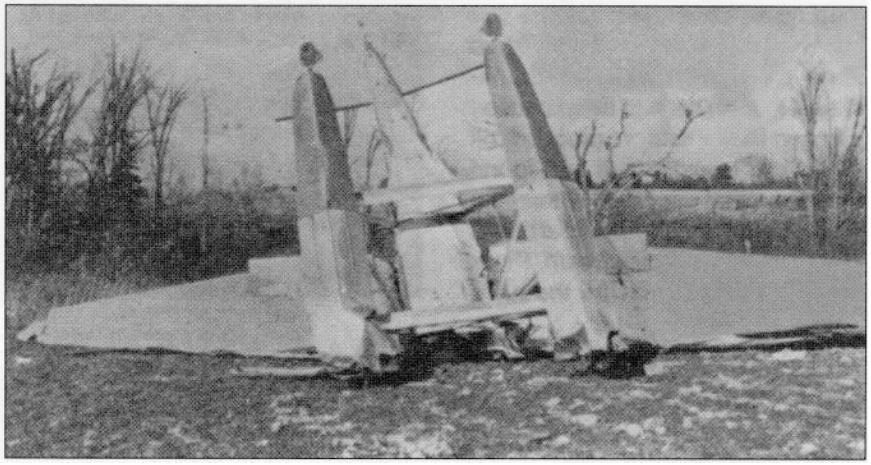
From Issue 1/76

Frost and Flight

When we say that we hate to tell this story, we really mean it. It's a story that we've told you before but still needs retelling.

After takeoff, the aircraft remained in a steep nose-high attitude, stalled, and dived into the ground. Witnesses heard the engine run erratically and it was not producing power at impact. However, more significantly, the aircraft was noticed minutes after the accident to be covered with a heavy layer of frost.

Medical evidence established that the pilot had experienced stress for several minutes before the impact, probably owing to the feeling of doubt about his aircraft. And well he should have — the aircraft had been on the river overnight, where it had accumulated a heavy layer of hoarfrost on its white wings.



Further, a significant amount of ice and water was found in the fuel system. With the daily temperatures varying above and below freezing, condensation was inevitable in the half-filled tanks. The below-freezing temperatures at the time also added to the risk of ice accumulation on the tailplane during takeoff.

He may have discounted the significance of the hoarfrost on his wings — if he noticed it. In any case, it would have been an awkward job to remove it, with his high-wing aircraft sitting out on the water. But the fact remains that a wing will lose lift when the air rushing over the upper surface does not adhere firmly to its curvature. And nothing will unglue air more readily than the irregular surface created by hoarfrost or snow crust. Every year, there's evidence that pilots choose to flirt with this lethal hazard.

From Issue 2/78

Wake Turbulence

A 737 was climbing from flight level 310 to 350, with a 747 cruising 12 mi. ahead at FL 350, when the 737 encountered wingtip vortices, The 737 pilot said that "moderate chop" for 45 seconds caused disturbance to articles in the passenger cabin, "annoying" the occupants.

Sometimes, wake turbulence is more than annoying — it can be dangerous. We know of a Canadian 727 that suddenly rolled 90° while climbing through the wake of a L1011 12 to 15 mi. ahead. Although the terms "wake turbulence" and "wingtip vortices" are often used interchangeably, wake turbulence includes all of the disturbed air behind the aircraft, including the downwash from the wings, which initially can be 1500 fpm. In this "wake" the two wingtip vortices join within 5 to 20 wingspans behind the aircraft. Wingtip vortices are by far the most dangerous, possessing tangential speeds of 224 fps. Vortices can persist for up to two minutes, which means that they are active at 16 mi. when the following aircraft is cruising at math .8.

Mothballed Aircraft

A recent US National Transportation Safety Board bulletin drew attention to the dangers of flying aircraft that have been brought out of storage. In one case, an aircraft stored for 19 months hadn't been properly prepared for storage or checked over before it was flown again. An inflight malfunction resulted and the two occupants were killed in the crash.

Proper preparation prior to and after storage could have prevented this needless accident.

From Issue 6/80

Say That You're There

The Twin Otter pilot was hopping mad. On final, he finds a sander on the runway and has to circle until it's clear. On the ground, he gives hell to the flight service specialist for not clearing the runway. Who's at fault? The pilot is.

Given a letdown clearance to the uncontrolled aerodrome, the pilot was instructed to call *immediately* on the local mandatory frequency. He didn't call until final. There wasn't time to clear vehicles from the runway.

Many pilots have become complacent in a radar-controlled environment. They have accepted others, doing their thinking for them. They expect the same environment at non-radar-controlled airports, which just isn't available. Flying into

uncontrolled aerodromes is a different world. People on the ground can't know that you're there unless you tell them. Other aircraft in the area will know your intentions only if you broadcast what they are.

Mandatory frequencies for each aerodrome are published in the VFR and IFR supplements. Use them to communicate your intentions and get the system to work for you.

From Issue 7/82

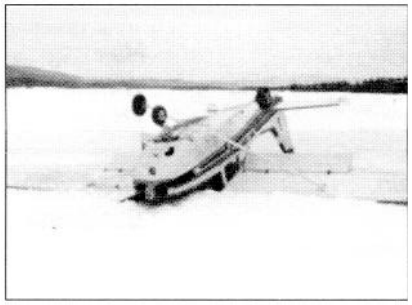
Snow, Slush and Drifts

Comes the "season to be jolly" — not to mention extra vigilant during takeoff, landing and ground operations. Here are a few brief examples of problems some pilots encountered last winter. Perhaps their experiences will help keep you out of trouble.

— The experienced PA23 pilot lined up with the centre of the runway on approach — at least he thought that he did. The snow-covered unmarked runway was difficult to distinguish from the surrounding terrain and he landed beside it. The right wing struck a snowbank at high speed and the aircraft pivoted 180° and ended up well bent (photo).

— Enroute, a low-time 172 driver decided to land to make a phone call. The airfield that he picked was only semi-snow-cleared, and so he attempted a short-field landing with an 8-kt. tailwind. He didn't make it. On the roll-out; the aircraft swung to the left, and right rudder didn't stop it. When the left wheel contacted snow at the edge of the runway, it dragged the aircraft around further. It slid sideways 400 ft. through deep snow, damaging the mainframe and lower cowling. Then he had a few more telephone calls to make.

— Another 172 pilot got too low on final in strong gusty winds. The mainwheels touched a snowbank just short of the threshold and the aircraft flipped onto its back (photo). He hadn't made enough allowance for the gusts and hadn't seen the snowbank.



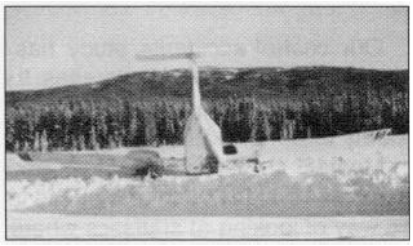
— A 150 student was practising solo for his night rating. On landing, the aircraft bounced. With the nose high, he lost track of the runway. The aircraft drifted left and, when it touched down again, the left wheel was in snow. This dragged it into a snowbank, where it nosed over inverted. Diversion of attention, even briefly, can lead to trouble.

— A Bellanca pilot was done in by a patch of slush. After the landing, the left wheel hit the patch and the machine was dragged into a snowbank and badly damaged.

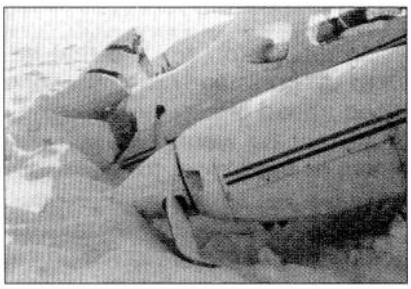
— A PA28 pilot was practising "off airport procedures." The trouble was that the wind was outside the maximum crosswind limits on the runway that he elected to use. It was more favourable on other runways. He used 25° of flap on approach and landing, then brought them up shortly after touchdown. As the aircraft decelerated, it weathercocked into the snowbank along the side of the runway. Ignoring the "book" resulted in an unexpected "off airport" landing, a bent propeller, a damaged nose gear, a crumbled wing, and probably a sadder but wiser pilot.

— The pilot of a ski-equipped 185 purposely planned to take off close to the edge of a snow-covered taxiway with center bare patches. Unfortunately, he was a little slow correcting for gyroscopic effect as he poured on the power. The aircraft swung. The left ski hit a snowbank and that was the end of the trip. The maneuvering safety margin had been cut too fine for recovery after a mistake.

— An experienced senior commercial pilot with an instrument rating had difficulty seeing where he was going on takeoff. It had been snowing all day and the runway was covered with two inches of fresh snow. Vis was down to less than a mile. Melting snow on the heated windshield added to his visibility problem, even though he got out of the aircraft just before takeoff to wipe it off. The runway lights were partially obscured by snow and he had trouble making out the edges of the runway. He lined up with what he thought was the center and applied takeoff power. The aircraft went straight as an arrow at a slight angle before it ran off the runway some 600 ft. along (photo). The nose gear collapsed as it plowed through a snowbank.



Two propellers were bent and the nose split open (photo). The provincial government operating the airport is evaluating a more suitable type of day/night/all-year runway markers.



A few reminders of winter hazards from other pilots' experiences. We don't want to write about you next year.

From Issue 6/87

Pilot Decision Making and Safety

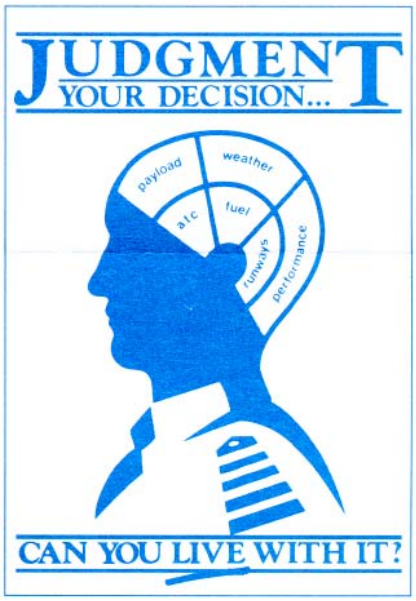
If you've decided to actively participate in the Pilot Decision Making workshops now being conducted by your Regional Aviation Safety Officer, you've already made a significant personal contribution towards the promotion of aviation safety in Canada. We hope that you'll attend and share your concerns at all of the PDM safety sessions being offered in your area.

If you're undecided about participating, contact your RASO and ask for more information about decision-making training and what it can do for you.

The program is very dependent on your participation. By your sharing some of your thoughts and concerns, others will benefit from your experiences. Of course, you'll gain too by listening and analysing the thoughts and concerns of other pilots.

The workshops being presented across the country by aviation safety specialists were developed by an international group of experienced pilots and aviation psychologists. Although decision-making concepts might appear to be complex, the workshop materials are presented in language that pilots understand.

You'll benefit by discussing successful flight scenarios resulting from correct decisions as well as learn from the fatal mistakes of others that resulted from either wrong or no decisions. The sessions will help you identify risks, stress and negative attitudes and teach judgment and decision-making concepts. Some of the concepts may be new to you. If not, hearing them again will jog your memory. We recommend that you give Pilot Decision Making a shot. Who knows — the life that you save may be your own.



You wake up in the morning, your brain clicks on and you have to start making decisions. Do you work? Do you play? What do you wear? What do you eat? If you're a flyer, you'll be deciding from preflight to post-flight. Are you prepared for it? Are you rested? Are you current? Can you handle it? Do you have a system to exercise sound judgment to assist you in completing a flight safely and efficiently?

Canadian aviation accident stats continue to reveal that too high a percentage of cause factors relate to judgment and decision making.

The following examples from a recent stack of Canadian Aviation Safety Board Aviation Occurrence Reports support that finding.

A Cessna A188B pilot decided to attempt a takeoff from a 16 ft.-wide dirt road. With ditches on either side, there was no margin for error. He lost directional control and ran the aircraft into the ditch on the left side, causing substantial damage.

The first poor *decision* was landing there. The second and costly one was attempting to take off.

A Piper PA3l-310 Navajo pilot attempted a cargo flight with three scheduled delivery stops. During the deliveries, the aircraft wasn't refuelled or even shut down at the last two stops. Enroute after the last delivery, both engines stopped. The aircraft was landed wheels up in a ploughed field. Damage was extensive.

The pilot admitted that he didn't compute fuel requirements and stated that he was anxious to get home because his wife was ill in the hospital.

Being preoccupied and stressed can have a disastrous effect on decision-making processes.

Although the pilot of a Lake LA4-200 was not instrument rated and most of his recent flying had been day VFR flights, he *decided* to depart from a remote site in marginal weather at night. Shortly after takeoff, the aircraft impacted the ice of a lake at high speed. The pilot and passenger were killed. The *decision* for the night departure in snow showers was the wrong one for the day VFR operator.

After starting the Piper PA-28-140, the pilot went to lunch and left the aircraft engine idling for 20 min. After lunch, he noticed that the aircraft was covered with hoarfrost. He removed some from the wing-root areas, but left the outer wings as they were. After a longer-than-normal takeoff roll, the aircraft became

airborne but wouldn't climb. The pilot attempted to turn to avoid some trees, but the left wing struck a tree. Damage was substantial.

Two factors contributed to this accident, and both involved decision making. Wings covered with hoarfrost won't fly. Engines with fouled plugs caused by excessive idling won't produce rated power.

We can learn from the mistakes of others, but it also helps when we upgrade or refresh our judgment skills. Whether you are a veteran flyer or a rookie, we recommend attendance at the Pilot Decision Making seminars that are being offered by your Regional Aviation Safety Officers.

From Issue 1/92

Company Aviation Safety Management

Immediately after an aircraft crashes, accident investigators launch into a concentrated search for cause factors. Their sole objective is to identify the cause and communicate it to the aviation industry in an attempt to reduce the chances of a repeat performance by another operator. Fortunately, many aircraft operators benefit from this approach to accident prevention, but, regrettably, someone always has to have paid the supreme price. You cannot just rely on learning from the mistakes of others — it's too much of a sacrifice for them!

In the majority of cases, accidents happen as a result of an unbroken chain of events that ultimately results in total system failure, but these events that form the chain can be controlled. As soon as the sequence of events is positively altered, the chain is broken and the accident prevented and reported as an incident with accident potential.

Breaking the chain is a challenge that all aircraft operators are confronted with. Some do it systematically and very effectively. Others do it by trial and error. The latter method very often costs lives and money in large amounts.

We believe that successful operators function efficiently and safely because of their Company Aviation Safety Management Program. With an effective program in place, accident chains rarely form. And in cases where they do begin to form, they are broken after the second or third link.

It does not matter how large or small an operation is. It could be one single-engined aircraft or a complex fleet of wide-bodied jet transports. The principles of aviation safety management are applicable to either and all of those in between.

Responsibility for safety always has to start at the top and work down through the various levels of management to the bottom rung.

Safety management requires professionalism, integrity and two-way communication.With effective communication and responsible attitudes, safety deficiencies are identified, reported and eliminated. To identify deficiencies, which are actually links of the accident chain, most operators require a dedicated safety officer to act as an advisor to the chief executive officer, a safety committee and a reporting mechanism so that all employees can assist in the identification of system flaws.

In the case of a one-person operation, the individual has to wear all the hats but still apply the basic principles of monitoring, identifying and acting to eliminate system deficiencies and reduce the accident potential.

We believe that our accident-prevention program offers a solution for establishing effective safety management.

The Directorate of System Safety staff in all of our regions provides guidance, courses and workshops on Company Aviation Safety Management to the Canadian aviation industry without cost.

If you do not have a safety program tailored to your needs, call on your Regional Aviation Safety Officer for assistance. Just turn to page 3 of this newsletter to get the telephone number.

Try it — you might like it!

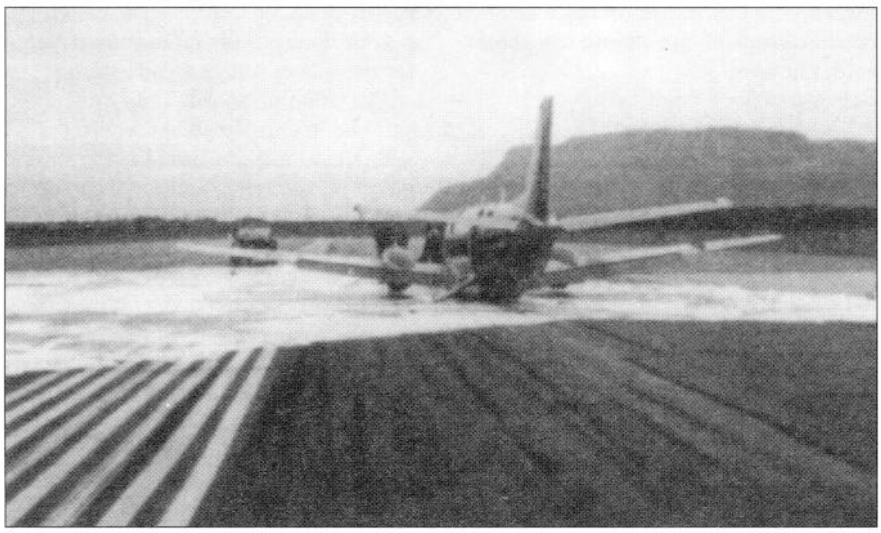
From Issue 1/93

"Check Gear Down"

As of May 1992, Canadian air traffic controllers discontinued the reminder to aircraft on approach for landing to "check gear down." The change was made to provide commonality among Canadian, US and ICAO recommended procedures.

To estimate the number of gear-up accidents that the call has prevented in the past is impossible, and concern has been expressed that the elimination of this call may have increased the risk of landing wheels up. However, over the past four years, there have been 70 accidents in which the pilot had simply forgotten to lower the landing gear. Of these, 23 occurred at sites with an ATS presence — a tower or FSS. By year, it breaks down as follows:
1989 — 16 accidents, 7 of which were at ATS sites;
1990 — 20/6;
1991 — 15/4; and
1992 — 19/6.

During the period from May to October 1992, when pilots did not benefit from the ATS "check gear down" call, we have seen 15 unintentional gear-up accidents — 6 at locations with an ATS presence. In previous years, the rates for the same six month period were as follows:



"Check gear down"

1989 — 11/5;
1990 — 14/4; and
1991 — 11/3.

Therefore, in comparison with past years, the analysis shows no significant trend since the call was eliminated.

The old friendly reminder was nice and probably saved some costly embarrassments, but, ATS procedures aside, it remains the pilot's responsibility to ensure that the checks are completed for every stage of the flight.

The ASL at Twenty-Five...Still Focussing on People Problems

Although much in aviation has changed in the past twenty-five years, much has remained the same. Looking over back issues of the ASL, we are reminded forcefully that there are no new accidents. What we see, time and again, are incidents where, somehow, an individual takes or fails to take an action, which eventually leads to a smoking crater or a few moments of stark terror. From such a review, it is easy to draw the conclusion that this safety promotion stuff is not working. Easy, but wrong.

Safety promotion is not the province of a bunch of earnest do-gooders diligently running around taking all the joy out of flying; rather, it is something done by experienced people who have identified various aviation hazards, assessed the risk that those hazards pose, and developed ways of reducing that risk. The ASL takes these lessons, most of which were developed by working pilots, and shares them with almost all Canadian pilots. Learning from the mistakes of others can help prevent the terror often associated with learning from mistakes of your own.

Often, accidents are caused by, well, people being people. Human performance limitations have bedevilled aviation since Orville bet Wilbur that the machine would indeed fly. The limitations are not solely those of pilots; designers, maintainers and others involved in aviation all contribute their share of human-performance causes to aviation accidents and incidents.

These human-performance occurrences have occupied the ASL during its first twenty-five years. In that time, aviation has advanced. Improvements in basic training have helped Canadian aviators reduce the frequency with which specific errors occur. Still, as a casual reading of Civil Aviation Daily Occurrence Reporting System (CADORS) reports will show, many of the same old errors continue to occur. The encouraging thing is that the frequency of the errors seems to be declining. Advances in technology help pilots — and others — avoid some of the more glaring errors from the past. However, technology imposes its own demands. One of the most frequent questions in automated cockpits is "What is it doing now?" This is not a comforting thought in mid-approach on the mythical dark and stormy night.

Regardless of the technological improvements, the basic building blocks for aviation risk management are still the standard Mark 1 human beings who sit down to design a better widget, build a better aircraft, fly the airplane, maintain the airplane, control the airplane, or complete one or more of the many tasks needed to ensure that a specific flight will get from A to B successfully. The ASL is aimed at these marvellously versatile, but quite vulnerable, links in the chain.

Over the years, the various ASL editors have struck a chord with readers, outlining effective, efficient ways of getting the job done without being preachy. This particular issue of the ASL marks two milestones in the newsletter's life. Yes, it is the twenty-fifth anniversary issue, but it is also the last one produced by Leif Schonberg, who is returning to the hangar line as a flight instructor for Transport Canada's pilot force.

In his years with the ASL, Leif focussed on general avia-

tion, on those pilots who do not have operations managers, chief pilots or anyone else looking out for them. He has written many articles describing how things fell apart for particular pilots and helped readers take measures that would prevent such misfortune in their own lives. Also, his deft editorial touch has made it possible for working pilots to share their experiences with others. He will be missed.

As the ASL enters its second quarter century, it may be time to focus on making it more broadly based. To date, many of the articles have been written by the editors. Maybe now it should be your turn. Each year, many of you come across unexpected problems in your flying. One way or another, you solve them and learn from your misadventures, but you can bet that, if something happened to you, it will happen to others. Why not share your experience? You can send an account of your exciting flight to the editor by phone, fax, snail mail or e-mail. The editor will protect you from grammatical lapses, preserve your anonymity, and share your experiences with approximately 50,000 other pilots, saving them from having to make the same mistakes themselves.

For the next twenty-five years, let us try to make the ASL a true "operator's paper," one that carries accounts of the neat ways in which people get themselves into trouble, and the even neater ways in which — generally speaking — they get themselves out of it.

However, before we embark on that second quarter century, let us pause for a moment to thank those who have built the ASL into a respected voice for aviation safety. All of them have helped Canadian pilots achieve a first-rate safety record, and they can be proud of their achievements. Let us also take a few moments to say farewell to Leif, whose work has truly advanced the cause of aviation safety. Fair skies and following winds, old friend.

Bob Merrick

If You Want to Be Found...Leave a Trail

Recently, an ultralight pilot departed his local air patch for a brief local pleasure flight. He hadn't returned by fuel-exhaust time, and his worried wife called the airport to ask about him. Airport security could tell her that the aircraft wasn't there, but the FSS reported that there was no flight plan or itinerary, and so they had no way of telling where the aircraft might be. The pilot's wife didn't believe that a search was needed until daylight, but the skeptics in the FSS began conducting field checks, asked high flyers to listen out for ELTs on 121.5 MHz, and advised the rescue coordination centre (RCC). The RCC called the search and rescue (SAR) squadron, which started cranking the gears to get the duty Herc and its crew airborne.

Shortly after, the pilot's wife decided that a search would be a great idea. While the duty SAR Herc was preparing to launch, the FSS contacted a local pilot familiar with the missing pilot's modus operandi. This pilot took off and, shortly afterwards, picked up a "Mayday" call from the missing aircraft. He relayed the crash position information to the FSS, and a local helicopter was sent to pick up the missing pilot.

As luck would have it, the missing pilot's misadventure had started shortly after takeoff. He had met some difficulty while operating at a low level and at low power settings and made a forced landing. The eventual landing site was not one that enjoyed radio contact with the FSS, and so he had been unable to alert others to his plight.

At first glance, this appears to be one of those all's-well-that-ends-well episodes from which we can glean no useful lessons, but there are a couple of points to ponder. For one thing, the pilot was flying an ultralight. This means that he probably didn't have an ELT. Thus, in the event of a crash or forced landing, he had no ready means of transmitting a constant distress signal on 121.5 MHz. Not having this safeguard means that another safeguard becomes even more important. And what safeguard is that?

That safeguard is the flight plan, the flight notification, or the flight itinerary. Sure, these things have been around for years, but how many people believe that they are useful for emergency purposes? Unfortunately, too few. However, flight plans, etc., are really a pilot's first line of defence in the unlikely event of a crash or forced landing. ELTs, as good as they are, can be consumed by a post-crash fire, submerged in a lake, or simply damaged beyond operability.

Flight plans are a different matter. ATS folks are extremely eager to log an equal number of takeoffs and landings over a period of time. If one of their little sparrows takes off and doesn't come back, they get extremely concerned and start doing frequency searches, airfield searches, and many things "you have not dreamed of." This includes notifying SAR and the Civil Air Search and Rescue Association, which will quickly start a search.

In this instance, the lack of a flight plan led to considerable uncertainty — uncertainty that was resolved by the FSS taking the action that would normally be taken to locate an overdue aircraft. But what prompted them to take the action? The inquiry from the pilot's wife. So

far, so good. However, she didn't have the information needed to be of much help, that is, where the pilot was going and how long he was expected to be gone.

In this case, the weather was good and there were no serious injuries. But let's change a couple of things. Let's suppose that a rapidly moving cold front rolled through the area well after the time that the pilot intended to be back, but before any alarm had been raised. Let's suppose, too, that serious injuries had resulted during the forced landing. Then what? The outcome could have been sadly different.

Sure, filing a flight plan, etc., can be a drag, but not filing one can lead to results that are even more of a drag. In this instance, a pilot spent an unexpected night in the wilderness and was apparently little the worse for it. However, the potential for disaster was there.

If you're one of those hardy individualists who says, "A plague on NAV CANADA and all of its works," you might want to do a quick attitude check; they're nice people, really, and they're there to help you. If you must express yourself by ignoring them, find a trusted agent, such as a spouse or a friend, and tell him, her or it, "I'm going flying along this route from A to B to C and back to A, and if I'm not back by nine o'clock tonight, call the FSS and tell them that I'm down somewhere along that route." Additional information such as the colour of the aircraft, the number of people on board, and the survival gear and radios on board would also be useful for this person to have.

Yes, this episode ended well, but it did so through good luck, not good management. This pilot bet his life on good luck. Would you be as lucky as he was?

Mountain Flying — Part II *cont. from p. 12*

was below and not visible. I remember thinking to myself at the time, "Better you than me, pal," but, on the coast, life goes on and, most of the time, so does the flying. Sometimes the weather cooperates and it's a pilot's delight; other times you wish you were home by the fire with a good book. Be cautious on the coast and ask lots of questions.

Mountain Strips

Mountain strips come in a myriad of sizes and shapes, each with its own idiosyncrasies. Some are one-way, meaning that you land one way and, usually because of terrain, take off in the opposite direction. With many one-way strips, you are committed once on short final. Overshooting would be out of the question because of the climb gradient required to clear terrain. Some are not strips at all, but rather straight stretches of logging roads used by logging companies. You may choose not to land on strips such as these, but keeping a mental picture of their position might come in handy in the event of an emergency. Airports range in height from sea level to as high as 9000 or 10,000 ft. Knowing how to calculate density altitude and how it relates to your aircraft's performance is imperative.

While stationed in Colorado Springs, Colorado, with the military, I had occasion to visit a small town in the mountains called Leadville. It boasts the highest airport on the North American continent at 9969 ft. The density altitude in the summer can reach 13,000 ft. I drove to the airport, more out of curiosity than anything, and spoke with a young instructor working at the flight school. She was teaching in a Cessna 172. When I asked her how she could constantly operate that close to the service ceiling of the aircraft, she replied, "Seems normal to me — I learned to fly here. It's all a state of mind. Besides, everything's downhill from here anyway." I guess the lesson here is that the more familiar you become with something, no matter how unusual, the more comfortable and proficient you become.

Many airstrips, such as those in Pemberton, British Columbia, and Banff, are at the junction of two or more converging valleys. Because each valley can generate its own weather and, therefore, its own wind, it's not unusual to see wind socks at either end blowing in opposite directions. Use extreme caution when operating in windy conditions from these types of strips.

Watch out for strips beneath glaciers and ice fields in the late afternoon. Subsiding cool air known as katabatic wind can cause considerable downdrafts and seriously diminish your aircraft's performance.

A word to the wise: avoid static run-ups on gravel and sand. By holding the controls back and learning to perform run-up and pre-takeoff checks while backtracking, you will save many dollars in propeller repairs. Be ready to go when you reach the end; by stopping, you can lengthen your takeoff roll by as much as 200 ft.

Mountain flying is a rewarding experience. Plan ahead, stay alert to the changing conditions, and enjoy the splendour below. Happy landings!

About the Author

Pat Very is a private pilot with a commercial licence. He started flying in 1970 on the East Coast, but since moving out West in 1978, he has accumulated over 4000 hrs of experience in and around the Rocky Mountains. △

Mountain Flying — Part II

by Pat Very

En Route

There are countless combinations of routes throughout the mountains and picking the right one for you, your aircraft and your load comes with practice. The best way to learn about mountain flying is to fly in the mountains. With every flight, you will become more comfortable and knowledgeable.

Always monitor 126.7 MHz en route and request station updates when within range of an FSS. The radio operators are real professionals and are the backbone of the system. Try to confine your requests to the last 50 min of the hour; the operators will be forever grateful for the time to get the hourly observations out on the computer for the rest of us.

Generally speaking, I like to travel as high as possible, consistent with comfort, and regularly fly at 10,000 to 12,000 ft. when crossing the rocks in VFR flight. Altitude has a number of advantages. Quite often, flying at 10,000 to 12,000 ft. will put you above scattered to broken cumulus and towering cumulus and, therefore, give you a smoother ride, lessening fatigue from turbulence. Altitude also will give you better radio reception for amendments and updates, as well as a larger spectrum from which to navigate. Then, of course, there is the old engine-failure scenario! Wouldn't it be nice to be high if that ever happened, especially in the mountains? With the advent of LORAN and GPS, it's easy to set out blindly across the rocks, oblivious to the consequences. Knowing where you are at all times and how far it is to the nearest airport, settlement or road is a must.

Approach pass summits and ridges in level flight. The clearance required will be determined by the wind direction, velocity and cloud base. Again, look for clues — ridge plumes, cumulus, bear paws, bending trees, wind on the water, and so on — and check your vertical speed indicator and altimeter. Under no circumstances should you still be climbing for this clearance altitude when arriving at the summit or ridge. If you have to turn around, make your decision early while there is still plenty of room. By the way, don't even think about penetrating cloud; it's the quickest way that I know of to become a statistic.

Watch out for the shadowed valley sides in the late afternoon: under certain conditions, they can all but disappear, leaving you with a dangerous guessing game. If you feel uncomfortable and conditions allow, climb for better reference.

On the bright side, generally speaking and owing to prominent landmarks, map reading tends to be easier in the mountains than on flat land.

For those of you with really light aircraft such as Cubs, Champs, and ultralights, a lift bonus can occasionally be reaped by flying the sunny or downwind side of the valley. Recently, while ferrying a J-3 Cub (without mixture control) through Banff, Alberta, back to Chilliwack, British Columbia, I found myself, owing to a variety of conditions, unable to climb to a safe altitude to clear the pass. After a few unsuccessful attempts, I spied a bright patch of sunshine on a west-facing slope. By positioning my aircraft over the sunny slope, I was able to climb to a sufficient altitude to clear the pass with a degree of comfort and safety.

Dominated by the Pacific with its many currents and weather patterns, the British Columbia coast presents unique challenges to the pilot. It is home to some of the fastest-moving weather on the continent. Conditions can change for the worse with very little warning. With its many channels, straits and fjords, the coast can be transformed by low ceilings into a series of tunnels, many of which have absolutely no flat ground before meeting the sea.

The lower the ceiling, the more the busy traffic is compressed into a smaller area. Under these conditions, be sure to have all lights on, keep a sharp lookout and try to stay to the right. Monitor local stations and transmit your position as you transit the area. Also, be aware of the new CARs requirements for VFR flight in uncontrolled airspace. Operating at or above 1000 ft. AGL requires the following:

1. during the day, 1 mi. flight visibility;
2. at night, 2 mi. flight visibility; and
3. 500 ft. vertically and 2000 ft. horizontally clear of cloud.

Operating below 1000 ft. requires the following:

1. during the day, 2 mi. flight visibility;
2. at night, 3 mi. flight visibility; and
3. flight clear of cloud.

Be sure to update your weather at every opportunity.

One fall afternoon at my Savary Island cabin just off Powell River on the British Columbia coast, I was standing on the deck listening as the familiar drone of a Beaver approaching the island got louder and louder. The weather was terrible. Low stratus capped the trees and I strained my eyes through the drizzle and fog to catch a glimpse of the aircraft as it passed. My cabin is located about 100 ft. above the sea and 100 yd. inland. As the sound reached its loudest point, I noticed a tail strobe just above the cliff. The rest of the aircraft

cont. on p. 11

Canadian Aviation Safety Seminar - CASS '98
April 21 and 22, 1998, Toronto
Human Factors Intervention Strategies

The tenth annual Canadian Aviation Safety Seminar, CASS '98, will take place in Toronto, Ontario, at the Airport Hilton Hotel on April 21 and 22, 1998. The theme of CASS '98 is "**Human Factors Intervention Strategies**."

The accident rate, defined as the number of accidents per 100,000 hrs of flying, showed a steady decline until the early 1980s, when the accident rate levelled off. Safety organizations studying this phenomenon concluded that the decline was largely due to the increased reliability of both air and ground equipment.

Research has indicated that 70 to 80 per cent of all aviation occurrences can be linked directly to human error. These errors are many-sided, ranging from errors in judgment to physical incapacitation of one or more crew members, and, in some cases, they can be traced to the corporate boardroom. Significant research has been conducted into the causes of and remedies for human errors in aviation. The results of this research are being applied in the operational environment, and these are the areas that will be explored during CASS '98.

Our goal is to provide attendees with specific and usable intervention strategies to break the chain of events leading to an occurrence. To achieve this goal, some of the leading experts in the field of human factors research and program development will be addressing the Seminar.

CASS '98 is aimed at company management: chief executive officers, directors, operations managers, chief pilots, maintenance directors, training directors and safety officers. However, the aviation community at large is being invited as well.

A series of training workshops will precede the Seminar on April 20.

Registration cost: $150 *Contact: System Safety, Ontario Region*
Tel.: (416) 952-0176 *Fax: (416) 952-0179* *E-mail: PAB@tc.gc.ca*

System Safety Regional Activities

Atlantic Region
Company Aviation Safety Officer Workshop cost: $100
March 31 to April 2, 1998 St. John's, NF
Course loading of twenty-four participants
Registration contact: G. Mike Doiron – (506) 851-6177

Quebec Region
Company Aviation Safety Officer Workshop
February 3 to 6, 1998 08:30 Quebec: Quebec Inn, 7175 Hamel Blvd. W, Ste-Foy
Registration contact: Janine Leclerc – tel.: (514) 633-3249; fax: (514) 633-3705

On request, Quebec Region offers the following:
– a one-day Cockpit Resource Management course; and
– a one-day Pilot Decision Making course.
Information contact: Janine Leclerc – tel.: (514) 633-3249; fax: (514) 633-3705

A three-hour Safety Seminar is offered to pilots as one way to meet the requirements of *Canadian Aviation Regulation (CAR)* 421.05.
Information contact: Brigitte Ouellet – tel.: (514) 633-3233; fax: (514) 633-3705

Ontario Region
Human Factors in Pilot Decision Making

This course meets the requirements of *Commercial Air Services Standards* (CASS) 722.17, 723.28 and 724.24 for flight in reduced visibility in uncontrolled airspace, as well as the currency requirements for the private pilot licence.

This is an eight-hour program and is presented in one day or over two evenings. There is no charge.

Date	Time	Location
February 19 and 20, 1998 (two parts)	18:00 to 22:00	Timmins, ON
February 26 and 27, 1998 (two parts)	18:00 to 22:00	Owen Sound, ON
March 5 and 6, 1998 (two parts)	18:00 to 22:00	Brampton, ON
March 19 and 20, 1998 (two parts)	18:00 to 22:00	St. Catharines, ON

This course is also available upon request with a minimum of fifteen participants, in which case it will be offered on a cost-recovery basis (travel and accommodations).
Information contact: Doug Malette – (416) 952-0181

Company Aviation Safety Officer Workshop

This course meets the requirements of CASS 725.07(3) (Air Operator Flight Safety Program), which specifies the training that an individual must receive to qualify as a flight safety officer.

This is a seventeen-hour program and is presented over two full days. The $100 fee for each participant covers tuition and materials only.

Date	Time	Location
January 29 and 30, 1998 (two parts)	08:00 to 16:30	Sioux Lookout, ON

This course is also available upon request with a minimum of fifteen participants, in which case it will be offered on a cost-recovery basis (travel and accommodations).
Information contact: John Donaldson – (416) 952-0178

Spring Weather Interpretation in Flight Planning

Spring introduces unique weather factors that a pilot must interpret from weather data. These data are critical to sound pre-flight decisions. This session focusses on a planning exercise using local TAFs and METAR. Come sharpen those skills and get ready for the demands that the season may *spring* upon the unprepared pilot.

There is no charge for this course.

Date	Time	Location
April 23, 1998	19:00 to 22:00	Brampton, ON

Information contact: Jeff Wearn – (416) 952-0674

Prairie and Northern Region

Command, Leadership Resource Management Two-day course: $100

January 27 and 28, 1998	Fort McMurray, AB
February 1998	Whitehorse, YK
March 1998	Calgary, AB

Company Aviation Safety Officer Two-day course: $100

March 1998	Yellowknife, NT
March 1998	Whitehorse, YK

Pilot Decision Making One-day course: $50
Available on request with a minimum of fifteen participants.

All of the above courses meet the requirements of the CARs.
Information contact: Carol Beauchamp – (403) 495-2258

Pacific Region

Safety Briefing

February 15, 1998	CASARA/Pacific Flying Club	Delta, BC

Pilot Decision Making Three-hour workshop: $25

February 24, 1998	Ramada Inn	Prince George, BC

Company Aviation Safety Officer Two-day workshop: $100

February 25 and 26, 1998	Ramada Inn	Prince George, BC

Registration contact: Gaye-Lynn Hattle – (604) 666-9517