1998, Issue 7

VECTOR

Pointing to Safer Aviation

Unnecessary Danger?

An engine failure in a single-engine aircraft while over large expanses of rugged terrain or a long stretch of water is a very serious situation indeed. This article looks at why we sometimes take such risks when flying cross-country, and it offers advice on how to reduce these risks through safer alternative flight-planning procedures.

Straight-Line Navigation

Many of us have probably taken risks by flying a single-engine aircraft over water or rough terrain that offers few suitably safe forced-landing opportunities. So why do we sometimes take such risks on a cross-country flight?

There are probably a number of reasons why. Many of us may believe that the probability of an enroute engine failure is extremely low – at least we hope it is. Others may think that the whole point of flying somewhere is so that we can take the most direct route, thereby saving time, fuel and money. A further reason may lie in the initial navigation training techniques that we received for our private pilot licence (PPL).

More often than not, we were taught to plan our cross-country by drawing a straight line on a topographical chart directly from point A to point B. From this track, and the forecast wind, we could then determine the required magnetic heading, work out the minimum enroute altitude, and then set off to fly that route. Such a straight-line track was relatively easy to navigate from. It allowed us to practice flying compass headings, compare the wind affecting us with the forecast wind, improve our map-reading skills, calculate our groundspeed to determine a precise ETA, and it made keeping an accurate flight log possible.

Often, dual navigation training for a PPL did not involve flying over extensive areas of mountainous terrain, so that the following solo exercise would still remain within our abilities as a student pilot. Consequently, we may have ended up gaining our PPL with less experience of

Photograph by John King courtesy of *NZ Wings* magazine.

planning a flight over difficult terrain than we would have liked – although there was always the option of furthering our skills by completing more advanced dual cross-countries in addition to those required for a PPL.

As a PPL, we may have continued to apply similar planning techniques to cross-country flights that involved flight over rugged terrain and expanses of water. In doing so we may have been exposing ourselves, and our passengers, to substantial risks in the event of an engine failure.

Safer Alternatives

Planning an alternative route that minimises the amount of time spent flying over rugged terrain will certainly improve your chances of finding a suitable forced-landing site should the need arise. The following points should help you to plan a safer alternative route next time you want to fly to a destination that has significant terrain or water between it and you.

Route Suitability

The first step is to decide whether the proposed destination and route is suitable for your level of experience and within the capabilities of the aircraft. If not, then consider a different route to the destination or, in some cases, a different destination altogether. It is worthwhile spending time exploring the options associated with a trip quite some time before the flight. Closely studying the topography on a 1:500 000 chart will help you form a mental picture of whether the proposed route is likely to offer a reasonable number of forced-landing options. It is also useful to look at the effect that airspace might have on your proposed route. Giving consideration to the local weather systems that you are likely to encounter along your proposed route is worth thinking about too. If you are at all uncertain, you may like to discuss the possibilities with a more experienced pilot.

High Terrain

If there is a significant amount of high terrain along your proposed route, then

Continued over...

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VECTOR

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Next Issue

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... continued from previous page

determine if you are able to avoid it by planning a route via a coastline, a substantial valley system, or over regions of clear flat terrain. (Bear in mind that valleys can have wind systems that produce turbulence and downdraughts.) Any of these options will provide you with many more forced-landing options – or at least reduce the amount of time that you and your passengers are exposed to the risks associated with operating over rugged terrain.

Water

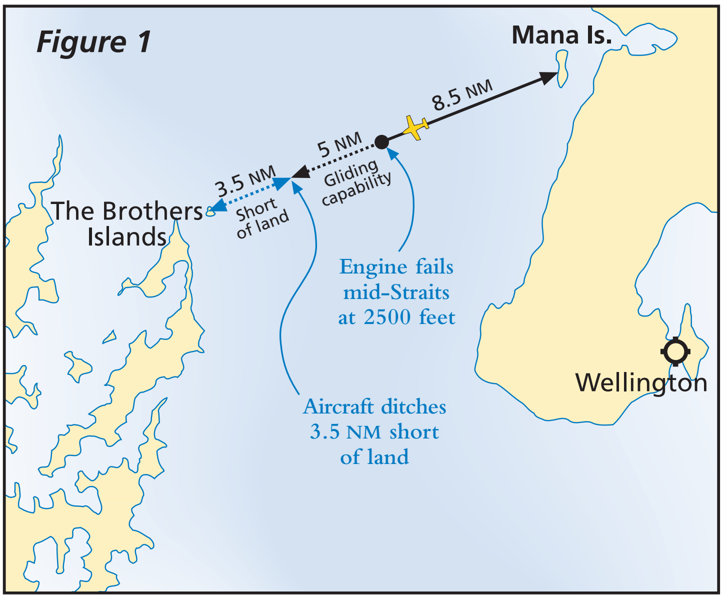
If there is a long stretch of water between you and your destination, then plan to remain within gliding distance of the coastline for as long as possible before crossing the shortest stretch of water to reach your destination. Crossing Cook Strait is a good example of how this technique can be applied to reduce the risks. The Bay of Plenty, Hawke Bay, the Hauraki Gulf, the West Coast of the lower North Island, Tasman Bay, and Foveaux Strait are other examples where adequate planning is needed. Remember that part of the flying over, or near, water (a frequent occurrence in New Zealand) also means having life jackets handy – or wearing them.

Altitude

Whether flying over water or rugged terrain, altitude is time. Time to rectify a problem, time for emergency calls (with improved reception), time to select a

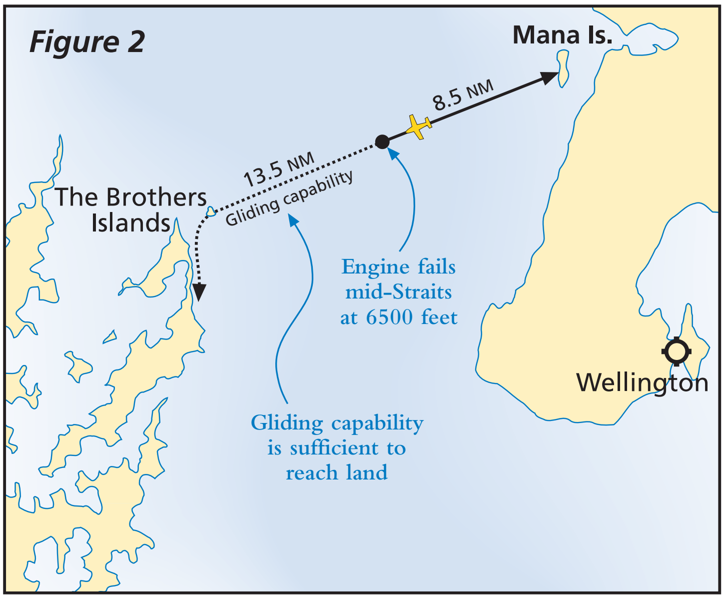
Aircraft gliding capability from 2500 feet

This example illustrates the typical gliging capablities of a single-engine aircraft following an engine failure at 2500 feet and assumes nil wind.



Aircraft gliding capability from 6500 feet

This example illustrates the typical gliging capablities of a single-engine aircraft following an engine failure at 6500 feet and assumes nil wind.



forced-landing location, and time to glide away from danger.

Plan to fly at an altitude (caution airspace) high enough to give you the ability to carry out the forced-landing checks and glide to a suitable landing site. Additional altitude will also give you time to better fix your position for Search and Rescue purposes. When crossing Cook Strait for example, request Controlled VFR into, or through, the Wellington TMA. From time to time IFR arrivals and departures at Wellington may mean that a higher Cook Strait crossing can not be facilitated, but it is often there for the asking. Crossing at 6500 feet, for example, instead of 2500 feet (the lower limit of the Wellington TMA) will provide you with approximately another eight nautical miles of still-air gliding capability in most light single-engine aircraft. See figures 1 and 2.

GPS

As tempting as it is to take the straight-line route, so too is it tempting to use the GOTO function on your GPS. While GPS is a very useful navigational aid in VFR flying, it should not be used in GO TO mode when you know that the resulting heading will take you over inhospitable terrain. Using GPS frequently on cross-country flights may also mean that your enroute map-reading skills will suffer – which can quickly work against you if your GPS fails. Having a number of predetermined legs programmed into your GPS, that avoid areas of rugged terrain, is a much better way to make use of this powerful navigational aid.

Distance vs Cost

Some pilots may see the extra distance involved in taking a safer alternative route as making the flight a lot more expensive. Surprisingly, it adds very little to the total flight time and therefore the cost of the flight. The following example illustrates this:

Consider a flight from Paraparaumu to New Plymouth that has a straight-line distance of 118 NM and would involve flying over a substantial stretch of water (nearly 70 NM of it, and up to 25 NM from the shore) – a high level of risk in a single-engine aircraft.

A much safer alternative would be to track from Paraparaumu to Wanganui to Hawera and then to New Plymouth; this is just 16 NM further than the direct route and requires you to be no more than 9 NM from the coastline. This adds just 9 minutes (with a ground speed of 100 knots) to the total flight time and puts you within easy gliding distance of the coast (assuming nil wind) from 5500 feet. See figures 3 and 4.

This example would require clearance into the Ohakea TMA. At lower altitudes a route via, or near to, the coastline is the safer option (the extra distance involved is minimal).

Duty of Care

Section 13 *Duties of pilot-in-command* of the Civil Aviation Act states that, "The pilot-in-command of an aircraft shall be responsible for the safe operation of an aircraft in flight, the safety and wellbeing of all passengers and crew…"

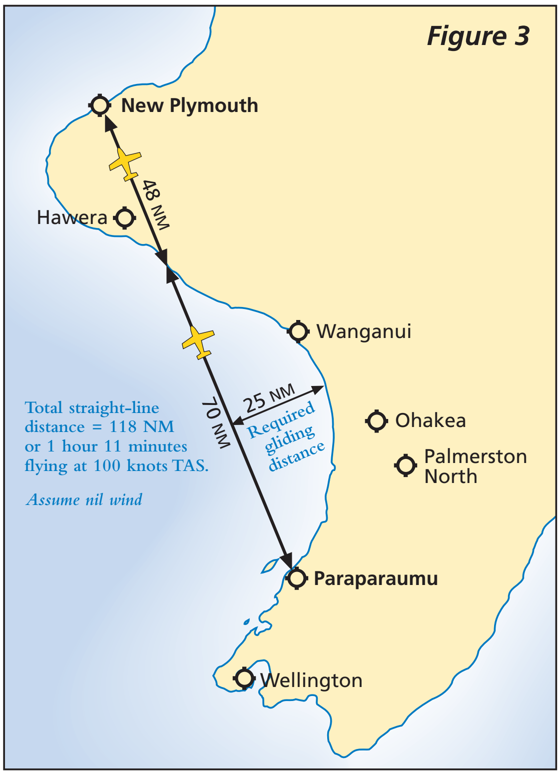
If during the course of an accident investigation as a result of an enroute engine failure, it is considered that you failed to take reasonable precaution and care to avoid danger, by failing to operate within safe parameters, then it is possible that you could face legal action.

Section 156 *Duty of persons in charge of dangerous things* of the 1961 Crimes Act states that, "Everyone who has in his charge or under his control anything whatever, … operates, or maintains anything whatever, which, in the absence of precaution or care, may endanger human life, is under legal duty to take reasonable precautions against and to use reasonable care to avoid such danger, and is criminally responsible … to discharge that duty."

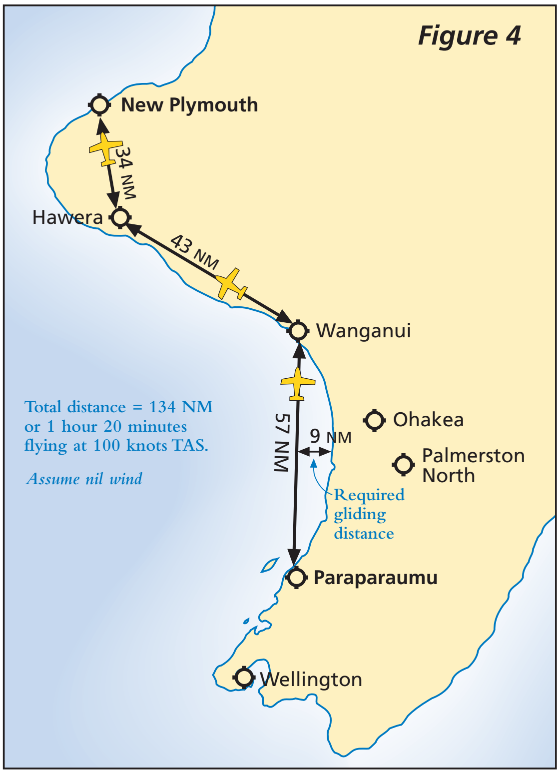
An aggrieved passenger, relative, or the Police, may decide to commence legal proceedings under Section 156 of the Crimes Act if it can be shown that reasonable precaution could have been taken by choosing a safer, and practical, alternative route to the one taken.

Although such cases are not common, you should be aware of the possibility of prosecution action and the severe consequences of any conviction that might follow.

Original Straight-line Route



Safer Alternative Route



Summary

Flight planning so that you minimise the amount of time spent flying over extensive areas of mountainous terrain or long stretches of water will significantly reduce the risks associated with a forced landing following an enroute engine failure. Selecting an alternative route, one that maximises the number of forced-landing options, is sound aviation practice. It often does not add as much to your flight time, and to the total cost of the flight, as you might think. The extra expense involved is a small price to pay when you consider the very real safety benefits.

If any flight leaves you thinking, "I'd have been in trouble if the engine had stopped", then it probably means that you should have planned an alternative route. ■

Fuel Selectors

SHARE YOUR EXPERIENCE

Graeme O'Neill, CFI of the South Canterbury Aero Club, recently contacted us to share this scary experience with Vector readers.

I had been in the circuit at night for about 40 minutes, and we planned to do only a couple more before heading back to the aero club.

My student had over 100 hours total time, with some 20 hours on type (PA 28-181) and more than enough night hours to meet the PPL night-rating requirement.

Mid downwind, during his drills, the student said he was "changing from the LEFT tank to the RIGHT tank" – this involved switching the selector from the 12 o'clock to the 3 o'clock position. We continued downwind, and he proceeded to set the aircraft up for the approach.

A few moments later I noticed that the rpm was a little low, too low for a powered approach. My student also realised this, attributing it to having set the power too low for the downwind leg, and consequently he began to open the throttle again.

As I watched his hand moving the throttle forward I was starting to think that very little was happening. There was not a lot of noise coming from up front.

I took control of the aircraft and opened the throttle myself, but still nothing happened. By this time we were well downwind.

The reality of the situation **began to well and truly hit home**, so I turned the aircraft straight for the aerodrome, while carrying out my checks to restore power.

I checked what instruments and controls I could see in the dark, while my student located his torch to check the fuel selector position. I made sure that the carburettor heat was ON, the mixture was RICH, the electric fuel pump was ON, and that we had fuel pressure – but **there wasn't any**. Before I could suggest to the student that perhaps he had selected an empty tank, or turned the fuel OFF, he had found the problem for himself.

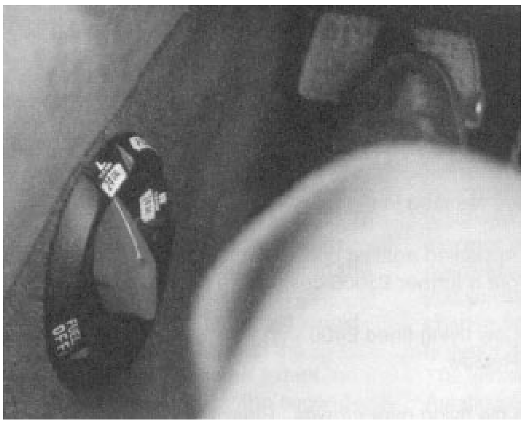
This fuel selector belongs to a British PA28-140 that experienced in-flight fuel selection problems. The selection lever could not be fully rotated to the righthand tank position due to a loose trim screw jamming its tail-end. Fortunately, there was sufficient fuel in the lefthand tank to complete the flight safely. Aircraft fuel selection units certainly do warrant an inspection from time-to-time to check their function and condition.

With a quick turn of the selector handle, engine power was restored within a few moments and a safe landing was carried out at the aerodrome.

From the point of engine failure to when power was restored probably took up to a minute – in that time we had lost 600 feet and were not looking like making it back to the aerodrome.

This experience has been very useful to me. In over 5000 hours instructing I have never experienced an engine failure – and I still haven't really – it was **pilot failure** (as most are).

I had assumed that my student knew where each tank position was on the selector, which he did, but he somehow got it wrong on this particular occasion – even though he had a reasonable amount of experience on type. I failed to confirm his cockpit check actions because of this assumption.



The fuel tank selector on the PA28-181 involved in this incident is located in a position such that it can be difficult to see at night without the pilot having to hunch forward.

Photographs courtesy of General Aviation Safety Information Leaflet.

I was unaware of this problem that allowed the detent [a small spring loaded cam device that has to be indented to allow further travel of the selector handle] to be over-ridden and allow the fuel supply to be inadvertently turned to the OFF position. Perhaps I should have known of such a problem, but as a pilot I have had little need to turn the fuel off, and such failures had never been reported to me in the past.

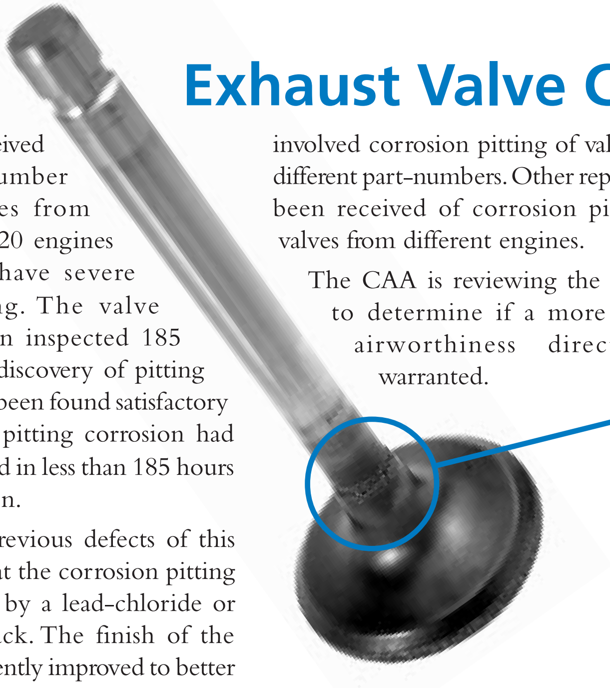
This incident could have easily resulted in a serious accident was it not for the quick actions of the instructor in completing the engine trouble checks to restore the fuel flow. Inadvertent fuel tank selection, or indeed turning the fuel to the OFF position, is often a causal factor in engine failure situations. This is particularly true for multi-engine aircraft and those with more than two fuel tanks. The more complex the fuel system, the greater the need for pilot familiarity of that fuel system.

If we become accustomed to changing fuel tanks by relying on the 'feel of the fuel selector lever' without confirming its position visually (and the Piper Archer in the above incident has the fuel selector out-of-sight by the pilot's left leg), then we run the risk of making an inadvertent fuel position selection – especially if the fuel selector mechanism fails, or it is dark in the cockpit for example.

We would like to emphasise that **both visual and 'hands on'** physical confirmation of all control positions when carrying out any drills, or cockpit procedures, is **an absolute must** to reduce the chances of getting something wrong. Cockpit checks should not be carried out in an automatic fashion, but instead require a moment's thought as to whether the control selection you are about to make is going to achieve the desired result – particularly if you are not especially current or totally familiar with the aircraft type.

We also suggest that it is **not advisable** to change fuel tanks just prior to takeoff, or at any other point where you are so low to the ground that you will be unable to rectify a fuel-flow problem should it develop. Whenever fuel tanks changes are made, the electric fuel pump (if fitted) should be turned ON, and fuel pressure should be monitored after the new tank has been selected. ■

Exhaust Valve Corrosion

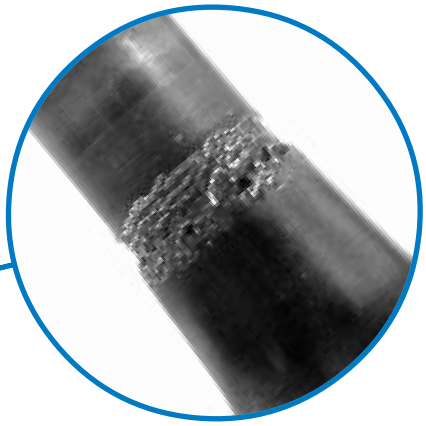


The CAA has received reports that a number of exhaust valves from Continental IO-520 engines were found to have severe corrosion pitting. The valve pictured had been inspected 185 hours before the discovery of pitting corrosion and had been found satisfactory at that time. The pitting corrosion had therefore developed in less than 185 hours of engine operation.

Investigation of previous defects of this nature revealed that the corrosion pitting was caused either by a lead-chloride or lead-bromide attack. The finish of the valves was subsequently improved to better resist the corrosion. This attack was more likely on engines or individual cylinders running cool. The engines of some operators suffer severe corrosion pitting (as pictured), engines of other operators do not suffer at all. The type of aircraft operation, environment and exhaust system all appear to affect the severity of the pitting corrosion.

An airworthiness directive (DCA/CON/140) was issued in September 1974 to require repetitive inspections of Continental IO-520-D and IO-520-F exhaust valves for corrosion pitting. This airworthiness directive was applicable to only two valve part-numbers. Recent reports (including the valve pictured) involved corrosion pitting of valves with different part-numbers. Other reports have been received of corrosion pitting on valves from different engines.

The CAA is reviewing the situation to determine if a more general airworthiness directive is warranted.



This close-up view shows the pitting corrosion which had developed in less than 185 hours of engine operation.

ASC Course Reminder

Don't forget the Aviation Safety Coordinator training courses to be held in Christchurch on 26-27 November and in Auckland on 3-4 December.

An Aviation Safety Coordinator runs the safety programme in an organisation. Does your organisation have a properly administered and active safety programme? (See last issue of *Vector* for a further detail on the 'what and why' of an aviation safety programme.)

If you are involved in commuter services, general aviation scenic operations, flight training or sport aviation this course is relevant for your organisation.

For further information and enrolment forms contact:

Rose Wood, Publications Assistant,
Civil Aviation Authority,
PO Box 31-441, Lower Hutt.
e-mail **woodr@caa.govt.nz**

Safety Seminars

This year's series of safety seminars is well underway. The theme this year revolves around maintenance requirements and responsibilities, and it is applicable to general aviation pilots, operators, owners and engineers.

The focus is not upon the specifics of how to do particular maintenance but rather upon the critical framework of rules, requirements and responsibilities that exist between the various parties in order to achieve compliance and high safety standards.

Achieving a high standard of maintenance is a function of good plant, good planning and good decisions. The seminar looks at the ingredients to assist this and highlights the relationships that exist between engineer, owner, operator and pilot to achieve serviceability and safety. The roles and responsibilities of all the participants are explored.

If you fly, operate or own an aircraft, then this seminar is pertinent to you.

The seminars will be presented by Owen Walker, CAA Field Safety Adviser (Engineer), and he will be assisted by industry engineers.

While we will continue with the separate Heli-Kiwi and Aero-Kiwi titles, but we emphasise again that you can attend either type of seminar – the topic is universal, and we will incorporate both helicopter and fixed-wing examples in each seminar.

The remaining Aero-Kiwi seminars are listed on the right.

Thu, 22 Oct, 7:00 pm – 10:00 pm
Aero-Kiwi Seminar. **Tauranga**
Aerodrome, Tauranga Aero Club

Sun, 1 Nov, 9:30 am – 12:30 pm
Aero-Kiwi Seminar. **Timaru**
Aerodrome, South Canterbury Aero Club

Sun, 15 Nov, 9:30 am – 12:30 pm
Aero-Kiwi Seminar. **New Plymouth**
Aerodrome, New Plymouth Aero Club

Tue, 17 Nov, 7:00 pm – 10:00 pm
Aero-Kiwi Seminar. **Ardmore**
Aerodrome, Auckland Aero Club

Thu, 26 Nov, 7:00 pm – 10:00 pm
Aero-Kiwi Seminar. **Nelson**
Aerodrome, Air Nelson Training Centre

Sun, 29 Nov, 9:30 am – 12:30 pm
Aero-Kiwi Seminar. **Greymouth**
Aerodrome, Greymouth Aero Club

Restrain Yourself

Accident abstract one: In December 1995, a shooter fell from a Robinson R22 helicopter during an airborne deer-hunting operation and sustained fatal injuries. The probable cause of the accident was the opening of the karabiner used on the shooter's harness by equipment or clothing, thereby causing him to become unrestrained in the helicopter. The Transport Accident Investigation Commission (TAIC) report also found that it was possible that the shooter did not connect his harness prior to the accident flight.

Accident abstract two: In July 1990, three occupants of a Cessna 172 were killed and one seriously injured when their aircraft crashed after encountering bad weather in confined terrain. The TAIC report found that the accident "was survivable" and that "had the rear seat occupants been restrained by the lap strap…their injuries would have been significantly reduced." The report went on to state that, "Had the rear-seat occupants had upper-restraint harnesses available, and worn them, it is likely that they both would have survived." and that "The rear-seat occupants may have contributed to the pilot's injuries by the addition of their momentum to the load on the pilot's restraint systems."

These accidents, and several other similar fatal accidents over the last eight years, highlight the importance of all crew and passengers being adequately restrained by an appropriate seatbelt system. This is especially true for helicopter operations that involve the removal of side doors, for example, but it is equally important in all other areas of aviation.

A seat belt and shoulder harness that is fitted correctly can substantially reduce the chance of injury in an aircraft accident. The Unites States Federal Aviation Authority (FAA) believes that aircraft accident fatalities and serious injuries could be significantly reduced if everyone wore shoulder harnesses.

"Make checking that your seat is securely locked part of your DVAs."

Shoulder harnesses have been standard equipment in the front seats of most general aviation aircraft since the late 1970s (although there are still a number of aircraft without them), and they were in many aircraft for quite some time before that. But anecdotal evidence suggests that pilots, and their front-seat passengers, sometimes treat shoulder harnesses as optional equipment and omit to use them.

Pilot Responsibility

Civil Aviation Rules, Part 91 *General Operations*, spells it out. Rule 91.205 (a) *Crew members at stations* states that; "Each crew member on duty during takeoff and landing…shall have their safety belt fastened…" Rule 91.207 (a) *Occupation of seats and wearing of restraints* also requires that, "Each pilot-in-command of an aircraft shall require each passenger to occupy a seat or berth and to fasten their safety belt, or restraining belt, and, if equipped, shoulder harness…"

This photograph illustrates how a watchstrap, jersey or coat sleeve can unknowingly become caught under the seat belt locking mechanism and release it.

The pilot-in-command's responsibility is clear. That responsibility should extend to briefing your passengers on how to fasten, and unfasten, their seat belts and shoulder harness prior to the flight. This should include getting them to practice unfastening their seat belts as well. It is equally important to point out that passengers should not unfasten their seat belts during the enroute portion of the flight, and that seat belts need to be tightened if turbulence is encountered.

Fitting Your Belt

Seat belts and shoulder harnesses must be worn correctly if they are to restrain you properly in the event of an accident. Wear your belt as low as possible across your hips, and make sure that you tighten it securely before fitting your shoulder harness. This will prevent the lap strap from riding up your body when you tighten the shoulder harness and make the whole restraint system more effective in an impact situation.

While correctly adjusted inertia-reel belts should fit closely, fixed-position shoulder harnesses need to fit snugly (but not tightly) across your chest. It is important that your seat position is adjusted so that you can reach all the necessary flight controls without slacking off your shoulder harness too much. You should never have more than a fist width between your shoulder strap and your chest to make the shoulder restraint effective in an impact. Be cautious of the fact that both the lap strap and shoulder harness can work their way loose during flight and may require checking on a regular basis – especially during turbulent conditions.

If your aircraft is not equipped with shoulder harnesses, then consider having them fitted – they are one of the most cost-effective safety devices that you can ever purchase for your aircraft.

Maintenance of Belts

Many of us at times overlook the condition of an aircraft's seat belts before making a flight. Frayed and twisted belts with worn buckles may not do the job when you need them to. Make checking the condition of seat belts part of your pre-flight walk-around, and any damage that you find report to the aircraft operator.

Securing Cabin Baggage

One area of cabin safety that is sometimes neglected is the securing of baggage. You are not prepared for flight unless you have secured all baggage – particularly heavy items that are located in the rear of the aircraft; these have the potential to become hazardous during a sudden deceleration. It is especially important to secure all rear-seat baggage (usually placed there for weight-and-balance reasons) using the rear-seat lap straps.

Locking Your Seat

Ensuring that your seat is locked in position before takeoff is vital. This is something that is often omitted as part of the drill of vital actions (DVAs). To make matters worse, the front-seat anchor point that the lap strap and shoulder harness lock into is often attached to the seat itself in light aircraft. If the seat is not locked properly, then it is likely that it will not hold during a sudden deceleration – rendering the whole restraint system useless. Make checking that your seat is securely locked part of your DVAs. Checking that your seat is locked will also prevent you, and the control column, from suddenly sliding rearward when the aircraft nose is lifted to the climb attitude – a potentially very dangerous situation.

Summary

Remember that the best protection that you and your passengers can possibly have in the event of a crash impact is through the wearing of a correctly fitted and maintained seat belt and shoulder harness system. As the pilot-in-command **you** are responsible for making sure that everyone wears their safety belt and shoulder harness – it could mean the difference between a life and a death. ■

Photograph courtesy of General Aviation Safety Information Leaflet.

Field Safety Advisers

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Note that John Fogden's fax number has changed.

Safety Videos – *A Great Christmas Present*

Here is a consolidated list of safety videos made available by CAA. Note the instructions on how to borrow or purchase (ie, don't ring the editors.)

Civil Aviation Authority of New Zealand

No	*Title*	*Length*	*Year released*
1	Weight and Balance	15 min	1987
2	ELBA	15 min	1987
3	Wirestrike	15 min	1987
5	The Human Factor	25 min	1989
6	Single-pilot IFR	15 min	1989
7	Radar and the Pilot	20 min	1990
8	Fuel in Focus	35 min	1991
9	Fuel Management	35 min	1991
10	Passenger Briefing	20 min	1992
11	Apron Safety	15 min	1992
12	Airspace and the VFR Pilot	45 min	1992
13	Mark 1 Eyeball	24 min	1993
14	Collision Avoidance	21 min	1993
15	On the Ground	21 min	1994
16	Mind that Prop/Rotor!	11 min	1994
17	Fit to Fly?	23 min	1995
18	Drugs and Flying	14 min	1995
19	Fatal Impressions	5 min	1995
20	Decisions, Decisions	30 min	1996
21	To the Rescue	24 min	1996
22	It's Alright if You Know What You Are Doing – Mountain Flying	32 min	1997
23	Momentum and Drag	21 min	1998
24	The Final Filter	16 min	1998

Miscellaneous individual titles

Working With Helicopters		8 min	1996*

*re-release date

Civil Aviation Authority, Australia

The Gentle Touch (Making a safe approach and landing)	27 min
Keep it Going (Airworthiness and maintenance)	24 min
Going Too Far (VFR weather decisions)	26 min
Going Ag – Grow (Agricultural operations)	19 min
Going Down (Handling emergencies)	30 min

The videos are VHS format and may be freely copied, but for best quality obtain professional copies from the master tapes — see "To Purchase" below.

The New Zealand tapes are produced on a limited budget, the first 11 titles using Low-band equipment. Quality improves in later titles. While the technical quality of the videos may not be up to the standard of commercial programmes, the value lies in the safety messages.

To Borrow: The New Zealand tapes may be borrowed, free of charge, as single copies or in multi-title volumes (Vol A contains titles 1 to 8, Vol B titles 9 to 14, Vol D titles 15 onwards. The Australian programmes are on a multi-title volume (Vol C). Contact CAA Librarian by fax (0–4–569 2024), phone (0–4–560 9400) or letter (Civil Aviation Authority, PO Box 31–441, Lower Hutt, Attention Librarian). **There is a high demand for the videos, so please return a borrowed video no later than one week after receiving it.**

To Purchase: Obtain direct from Dove Video, PO Box 7413, Sydenham, Christchurch. Enclose: **$10 for each title** ordered; plus **$10 for each tape** and box (maximum of 3 hours per tape); plus a **$5 handling fee** for each order. All prices include GST, packaging and domestic postage. Make cheques payable to "Dove Video".

Letters to the Editor

Night VFR Cross-Country

I enjoyed the article on night VFR in the latest Vector. It is well written and covers most of the considerations quite thoroughly. However, there are some additional important factors that should be mentioned to help training organisations who may be contemplating exercising the new night cross-country option.

Night VFR cross-country must be flown with a visible horizon. This point can not be stressed enough. The instrument training that the VFR pilot has already had is really only enough to equip the pilot to carry out, a turn and a climb, or a descent to regain VMC – not to fly the whole trip on instruments. When VFR, there is of course the responsibility to "see and avoid" terrain and other aircraft.

VFR pilots must take steps to try to avoid inadvertently entering IMC during a flight. One way of ensuring this is to only attempt night VFR cross-country flights on nights where there is a reasonable amount of moonlight. A good rule of thumb that I have adopted is to have not less than a quarter moon present, at least 30 percent above the horizon. Conducting a night VFR cross-country where there is little moonlight present (given New Zealand's sketchy weather information for VFR pilots below 10,000 feet) is asking for inadvertent entry into IMC – which will generally result in a serious accident or, if you are lucky, a serious fright. The presence of a full moon in the headline illustration was good to see, but its significance was not picked up on in the article.

This article may set off a wave of night VFR cross-country flights around New Zealand in fixed-wing aircraft. It did initially with the helicopter community, and several of them had some frightening experiences – like inadvertent entry into IMC. However, when it is done correctly with good preparation, over the right sort of terrain (forced-landing consideration) and on a suitable night, it can be an enjoyable experience.

When helicopter pilots had the 25 NM leash removed in the late 80's, a set of minimum training requirements was put into AC 61-1 by the CAA. These required a helicopter pilot to have 10 hours instrument flight time, to have done at least three hours of night cross-country training, and to have a certificate of competence placed in the pilot's logbook. This should have been prescribed for fixed-wing pilots when the 25 nautical mile limitation was lifted recently. I believe that it was an oversight on the part of the CAA, rather than a deliberate action, that effectively took the limits off fixed-wing pilots without putting in place the guidelines that were considered sensible at the time that night VFR cross-country was introduced for helicopters.

Ken Wells
Nelson, September 1998

Thank you Ken for the compliment on "Night VFR" and for your comments regarding the importance of having moonlight to maintain a visual horizon at night.

You express some concern as to the differences between the minimum experience and training requirements for pilots of fixed-wing aircraft and helicopters. There are several reasons why Part 61 *Pilot Licences and Ratings* requires helicopter pilots to have the additional training and experience.

Unlike for fixed-wing aircraft, instrument flight time is not a requirement in the helicopter training syllabus. Because of this, helicopter instrument training must be undertaken before a pilot can be certified for night VFR cross-country.

The extra three hours of night cross-country training requirement that you refer to relates to changes that were made under the old Civil Aviation Regulations following a number of serious helicopter accidents at night. Before these changes, there was an exemption which allowed helicopters to be operated 30 minutes either side of legal daylight hours. This privilege was misused by a number of helicopter pilots, which resulted in the current experience requirements being put in place.

As a result of your letter, the CAA rules team will look into night VFR cross-country requirements for both fixed-wing aircraft and helicopters, and they would appreciate any industry advice on what these requirements should be. ■

What's Wrong Here? – Answer

At first glance nothing. Quite the contrary, the pilot is cleaning the windshield before flight. The use of paper towels, however, is inappropriate for aircraft perspex. Coarse paper towels are sufficiently rough to scratch perspex windshields. Use only soft cloths and proper aircraft perspex polish.

If you are thinking about "Low Flying" – remember, the best you can do is match the record.

Publications

0800 800 359 — Publishing Solutions, *for CA Rules and ACs, Part 39 Airworthiness Directives, CAA (saleable) Forms, and CAA Logbooks. Limited stocks of still-current AIC-AIRs, and AIC-GENs are also available. Also, paid subscriptions to Vector and Civil Aircraft Register.*

CAA Web Site, http://www.caa.govt.nz *for CA Rules, ACs and Airworthiness Directives.*

0800 500 045 — Aviation Publishing, *for AIP documents, including Planning Manual, IFG, VFG, SPFG, VTCs, and other maps and charts.*

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CAA Act requires notification "as soon as practicable".