1997, Issue 2

VECTOR

Pointing to Safer Aviation

SHARE YOUR EXPERIENCE

A CO Experience

This item from British GASIL No 5 of 1996 provides a personal experience example to follow the general item published in Vector, 1997, Issue 1, and the letter to the Editor in this issue of Vector.

I have recently converted to a Mooney, and I must say I am in love. My wife says I would probably take it to bed with me if I could. After 20 hours flying I had noticed that one of the air ducts was not delivering fresh air as it should, and I also felt that the heater was still delivering warmth although it was closed off. My engineer was going to fix it when he could.

On an evening test flight, after adjusting engine tick-over, we were just flying along when suddenly we began to feel much greater heat than before, with a smell of engine. I turned to return to Shobdon at once, realising we had a problem, but even before sighting the field I began to have serious difficulties. My wife was also clearly in trouble.

I have read of the effects of carbon monoxide poisoning, but to experience them firsthand when flying is another matter. Being a psychologist by trade, once I had recovered sufficiently I jotted down the mental process as I experienced it.

Firstly, I felt distant to operations, and nauseous, and I began to have doubts whether I was really in the plane or was only dreaming. Part of me just wanted to sleep more than anything else in the world, but at the same time a little voice inside told me we were dying of CO poisoning, but I could not quite remember why.

But all I wanted to do was sleep and carry on dreaming. I began to try to determine whether it really was a dream or was this real — and frankly got more and more confused — and I became obsessed with this problem. Somehow, if I could find the bedroom light switch I was dreaming, but where the hell was it in the cockpit? I gave up on this and decided that I would carry on with the scenario whether it was real or not — nothing worried me by then, my thoughts came from a long way off. I reduced airspeed and opened the door, getting my wife to hold it, just to reduce the rising temperature which was becoming oppressive. Thoughts about fresh air had gone by now, and I was much more worried about being sick on the new interior.

So Shobdon was in sight, tried the radio but it was after closing, and somehow I prepared for a direct join on long final. Here routine took over and the right things got done without thinking — which was now almost impossible.

There was a 15 knot crosswind and somehow I knew things did not look right... Without thinking I went around, did a circuit on automatic, fighting extreme nausea, and this time made a good touchdown. I do not remember the taxi back and can only pick up the thread when we were fully stopped, neatly parked at engineering. My wife could not stand and looked awful, and I was unable to exit the plane for some time. We recovered enough to get home three hours later.

With 20/20 hindsight, I feel there were a number of lessons here.

- Carbon monoxide combines with haemoglobin avidly and is not easily released. Thus, recovery from whatever semi-conscious state we find ourselves in takes a lot of time.
- Its effect removes urgency, and one just is unable to assimilate reality. One experiences what could be described as an altered state of conscious awareness, rapidly moving to coma.
- Provided the difficulty is identified soon enough, well rehearsed routines remain in effect longest, and it is this that got us back on the ground. Original thinking and problem solving is impossible.

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Next Issue

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...continued from front page

- So we all read about human performance, but words in books cannot ever have the impact of experience. This is a problem that can happen to most aircraft at any time. I guess that quite a few unexplained accidents could be put down to this. Be prepared.

I know there are far more experienced people who could comment here, but I figure that we should consider the following.

- Do not defer any problems you may encounter with vent and heating controls. Ensure that flapper valves and cables are in order. Get your heat exchanger checked more often. I know it is yet another job, but believe me it is worth it.
- For God's sake fit a CO detector. These can be as simple as a pill, or more sophisticated systems are available.
- By the detector, place a check list of procedure should this deadly gas be detected. If you are overcome, you will not be able to remember what to do. Checks should include shutting heating ducts, opening all fresh air vents. Do you know at what speed you can safely open your door or canopy? Do you have oxygen? Use it if you do.
- We were lucky, Shobdon was dead close. If you are cross-country, consider a precautionary landing. If you leave it any longer, I doubt that you will make it.

Remember, winter will be here soon enough and those heaters will be going on ...

British CAA Comment

Subsequent engineering investigation showed that the carbon monoxide came from two cracks in the exhaust which were not able to be seen with the naked eye. The weld line looked as though it was a satisfactory weld.

The [British] CAA is currently funding a research project on carbon monoxide detectors for general aviation use.

Vector Comment

Simple "Carbon Monoxide Indicators" can be purchased for a few dollars from many New Zealand aviation spares and accessories suppliers. ■

Letters to the Editor

Carbon Monoxide

I was very interested to read the article ("Carbon Monoxide Poisoning", *Vector*, 1997, Issue 1) as it touched on both my job as a consulting chemist, and my hobby. Of particular interest was the acceptable limit, which was given as 50 ppm. Unfortunately some readers may only have noted the 100 ppm figure given in the accompanying table, which stated that this figure was allowable for several hours without adverse effect.

As noted in your article, CO poisoning is insidious by nature, rather akin to hypoxia. The main danger from low-level exposure to CO is an increased work-load placed on the respiratory system and heart due to the decrease in oxygen carrying capacity in the blood. The current TWA-WES* (occupational) standard in New Zealand is 25 ppm. Ambient air standards are set even lower. In industry, exposure to 100 ppm is not considered acceptable, due to both the physical stresses placed on workers, and the feelings of fatigue, lack of concentration, and headaches associated with this exposure. After discussing the article with the local OSH industrial hygienist, we feel that even 50 ppm seems rather high for pilots.

The important thing to consider is that pilots are operating at a reduced partial pressure of oxygen, and therefore any additional oxygen stress is undesirable. Flying is a lot of fun, but I find that there are enough physical and mental stresses involved, without adding unnecessary handicaps such as low-level CO poisoning. Luckily I avoid this by flying sailplanes!

As you conclude, satisfactory maintenance and monitoring where necessary is very important. I would be happy for any owners or operators who may require testing of their aircraft to contact me at [PO Box 8141 Christchurch, ph 0-3-338 7722, fax 0-3-338 7700].

*TWA-WES = Time-weighted average, workplace exposure standard.

Rob Hay, MSc(Hons)
Christchurch, February 1997

Thank you Rob, for adding to our understanding of the subject. It is clear that vigilance, along with careful maintenance and monitoring, must be the watchwords in keeping CO out of the cockpit. With the New Zealand workplace exposure standard set at 25 ppm, obviously the re-write of AIC-AIR 24 into an Advisory Circular for Rule Part 43 should explore this, and a copy of your letter has been passed to the AC author. In the meantime, he advises that the requirement for CO testing at the Annual or 100-hour inspection will be included in a revised Appendix C to Rule Part 43.

For more on the insidious gas, see the story in this issue, "A CO Experience".

Slip(stream) and Spots

I congratulate you and your staff for the continuing high standard of contribution that your magazine makes to aviation education and flight safety.

However, I have comments on a couple of the articles in the first issue of 1997, for your consideration.

"Constant-Speed Propellers"

Apparently this article was reprinted from the British *GASIL*. The Brits obviously left a deliberate error to test the alertness of their readers and you, seeing the ploy, chose to apply the same test to us, well done! [Who am I to argue with that? — Ed]

The thrust of the article was fine, ie "throttle quadrant aft" in the event of an engine failure, to minimise discing effect, thereby reducing drag and maximising glide range for a given airspeed.

But I had a little difficulty with the following statement:

"… since, in the absence of power, slipstream over the tail and elevator would have only given an unresponsive pitch control."

Firstly, the amount of slipstream from a failed engine's propeller is insignificant, **regardless of the propeller blade angle**. Secondly, control responsiveness is determined by V^2 (among other things). Sure, slipstream in normal flight increases the local V^2 around the aircraft's tail and consequent control response for a given deflection, but the absence of slipstream in this case would not have led to an "unresponsive pitch control". It is all up to the existence of V^2, and in this case, as your article mentions, there appeared to be a low nose attitude, so V^2 could reasonably be assumed to be at least moderate and therefore control response should have been adequate to modify the nose attitude and control the 'arrival'. The reason for this pilot's demise lies elsewhere.

How'd I do?

"Your Arse and the Grass"

Great title and great article. This is an absolutely superb contribution to safe flying which I very much enjoyed reading. Well done.

I would like to offer a thought though — the selection of the terminology that we use to describe various techniques can be critical to effective learning, especially for students with English as a second language.

The author of this article suggests that students should "Plan for and practise *landing on a spot*." While I think I know what he intends, I believe that we are better to "Plan for and practise *approaching to a predetermined* ***aim point***." (Refer R.D.Campbell pp 13-21 and Trevor Thom's Flight Training Manual pp 13-16/17).

In normal landings, the actual spot on which the aircraft touches down is less critical than the precise control of the final approach to a fixed aim point, in the way the author describes. It may sometimes be necessary to nominate a touchdown zone, beyond which a go-round is necessary, but this is getting a bit beyond the scope of the article.

Spot landings per se are only appropriate for aero club type competitions.

Thank you for the opportunity to provoke thought and hopefully discussion.

Mark Woodhouse
Palmerston North, February 1997

"Constant-Speed Propellers"

You did fine.

We chose this item mainly for the reminder to pilots to use coarse pitch for best glide in a real engine failure situation. Nevertheless, on pitch control we think you're closer to the mark than the original. Absence of power means in effect absence of slipstream, and this will be irrespective of propeller pitch. We must acknowledge that the absence of slipstream will mean that pitch control is **less** responsive (assuming the elevators are normally in the slipstream), but to say that it would be "unresponsive" we think is going too far (although we don't know the aircraft type involved, nor the specific accident details). It is possible that the propeller discing in fine pitch could create a blanketing effect to reduce the free airflow over the elevators. If this were so, then it would be an added reason for using coarse pitch in a real engine failure situation.

Stan Hayes telephoned the Editor to comment on constant-speed propellers. In his experience, he said, propellers automatically go into full fine in the event of engine failure.

This is true. When the engine fails, the CSU will try to maintain rpm appropriate to the propeller control setting, and to do so it will go progressively fine (to reduce its own blade aerofoil drag) until it reaches fully fine. There it will stay, unless the pilot does something about it. Moving the propeller control to full coarse (rpm LOW, DECREASE, etc) should ensure that the CSU design forces the propeller into full coarse pitch.

"Your Arse and the Grass"

Spot terminology. We take Mark's point. Nevertheless, the term was used in the context of a reminder article to club pilots (most of whom would be familiar with landing competitions), rather than as a definitive teaching item. Aero club landing competitions do teach pilots to land accurately. Certainly a stabilised approach is taught and executed using an aiming point, but the aiming point is dictated by the desired touchdown point.

It is up to individual instructors to make the distinction in terms so that the students are not confused.

Double Trouble

Questions and Answers

Here's a question for pilots of multi-engine aeroplanes. What does the pilot of a single-engine aeroplane do when their one-and-only engine fails?

Carry out a forced landing, right?

Here's another question. What would be the difference for you in a multi-engine aeroplane if all the engines failed? None, right? But while you may agree, are you prepared to act on your belief — without delay?

Remember the tragic Beech Queen Air accident, near Hamilton early in 1995, in which all six occupants died? One of the findings of the accident investigation was that, "... after the second engine failure, the crew failed to plan effectively for a forced landing, and ultimately failed to maintain controlled flight." (Transport Accident Investigation Commission Report No 95-004).

As a result of this accident, TAIC recommended to the Director of Civil Aviation that he "produce educational material discussing the ramifications of a double engine failure in a twin-engine aeroplane, with emphasis on the need for pilots to have an appreciation of the glide performance of the type(s) they are operating and the advisability of staying familiar with their basic forced landing training".

We at *Vector* think the recommendation is too narrow in being confined to "twin-engine", so all heavy metal pilots should pay attention as well.

The Advice

The "educational material" is simple. **Fly the aeroplane.**

Just remember that good advice you were given early on in your flying:

In any emergency

Aviate
Navigate
Communicate

in that order.

If you've got no power, then aviate means establishing the aeroplane in a glide – and keeping it there. It means planning for where the touchdown is going to take place. Are you aware of the glide speed for your aeroplane? If this information is not available in the flight manual, a rule of thumb is to calculate it as 1.5 times your stall speed. While not necessarily accurate for best glide speed, it should give a workable approximation.

Why?

So you know how to suck eggs! You know that to "fly the aeroplane" makes sense. We're willing to wager, however, that some of you are firmly of the opinion that in a multi-engine aeroplane, if the crew are on the ball, there should be no need to have to glide the aeroplane. That's what you may think. Well think again. You're in "it can't happen to me" territory.

In the Hamilton accident, the investigation findings included these two: "The aeroplane took off with the fuel selectors set to the almost-empty inboard tanks"; and "the engine failures were due to fuel starvation when the inboard tanks ran dry."

It happened. But there are other scenarios for total power failure.

What if your aircraft fuel system was contaminated with water? Remember some issues back (FSS-92-2) we highlighted a Piper Apache accident. While checking a fuel sample, the pilot noticed considerable water in the fuel and continued draining fuel until no water was evident. Nevertheless, at an altitude of 300 feet after takeoff, the right engine stopped, followed shortly thereafter by the left. During the emergency landing the aircraft crashed into trees and was destroyed. The pilot — who presumably "flew the aircraft" — escaped with minor injuries..

What if the contamination was with fuel of the wrong type or grade? Multiple engine failure will likely follow.

What if there simply wasn't enough fuel on board? Remember the early Boeing 767 successful engines-out forced landing. The aircraft refuelling process had got pounds and kilograms mixed up. Clearly that crew "flew the aircraft".

What about ingesting volcanic ash, like the British Airways 747. The crew of that aircraft didn't have to force-land, but they certainly knew how to glide the aircraft. What if all engines ingested birds during takeoff?

The above possible multiple engine failures are not at all common, but they can, and do, happen. The outcomes depend very much on the "sucking eggs"

advice. Those who "fly the aeroplane" usually come off relatively unscathed; those who don't, often don't. ■

Runway Road Rage

Late January this year, at just after 1.00 pm, a car was seen to be using the sealed runway and grass verges at Masterton airfield for various forms of off-road activity. It was a wonderfully sunny day — great for local flying, for agricultural operations, and for cross-country training. Masterton is an uncontrolled airfield. As this car raced up and down the main 06-24 vector with 'wheelies' now and then, the potential to ruin the day for a hapless pilot was obvious. Even with a full standard overhead rejoin the car might not be spotted. Even if observed, the driver's intentions would be unknown. The driver would certainly be unaware of joining aircraft traffic. With only the unattended frequency (119.1), the chances of alerting aircraft depended on observing this car and knowing that an aircraft was in the vicinity.

Fortunately, this was not the day to use the airfield as a drag strip. A CAA staff member was assisted by local operators in removing this vehicle (hot pursuit method) and the matter is being investigated by the appropriate authorities. There are some lessons, however.

First, the security of smaller airfields cannot be taken for granted. While there are notices about restricted entry or that the area is operational and prohibited, it cannot be assumed that these notices will always be observed or obeyed.

Second, it is a reality that the security of smaller airfields can only be lightly policed by the owners, the controlling authority, and the Police.

Operators on the airfield, including visiting pilots, need to be vigilant. Access-ways need to be controlled (that may mean shutting a gate behind you), and unauthorised persons challenged (this can be done politely).

Third, suspicious and obviously illegal behaviour needs to be prevented.

On these airfields it is no good thinking "it is not my responsibility", or that it will go away. A vehicle on an active runway is a "clear and present danger", fuel stolen is a loss, an aircraft interfered with is at risk, and a property broken into can be a major set-back for a club or organisation.

Keep your ears and eyes open, and be prepared to be involved to protect the collective interests of aviation safety.

Ross St. George

Part 91 Performance

With the demise of CASO 4 on 1 April 1997, P-charts (P = performance) are no longer CAA documents as far as private operations are concerned. Rule Part 91, however, still requires you to ensure that your aircraft can take off or land on a specific vector in the prevailing conditions. There are a number of ways of ensuring this, and the P-chart remains one very good means of compliance.

If you are operating under Part 91, then AC91-3, "Aeroplane Performance Under Part 91", is a good practical reference. (If you are operating under Parts 121 or 135, then there will be specific requirements you will need to meet.)

Essentially, AC91-3 says that you can determine the takeoff or landing distance of your aeroplane by one of three methods:

- CASO 4 P-Charts
- Group-Rating system
- Aircraft Flight Manual data

P-Charts

The P-charts have been developed from CASO 4 requirements, which give you a takeoff or landing distance at maximum all up weight by taking into account:

- density altitude;
- runway surface;
- runway slope; and
- surface wind.

Continue to use these as a very good way of determining whether or not you can operate safely in and out of a particular aerodrome.

Group-Rating System

If your aeroplane's Maximum Certificated Takeoff Weight is 2270 kilograms or less, then you can use the Group-Rating system. Each aeroplane is given a Group-Rating number in the aircraft Flight Manual. Each runway is given a group number. You can use the runway if it has a group number equal to or greater than the aeroplane Group-Rating number.

If you are using the Group-Rating system, and the runway is wet or contaminated, or the grass is long, then it would be a good idea to ensure that the group number of the runway is at least one number higher than the Group-Rating number specified in the Flight Manual.

Aircraft Flight Manual Data

All aircraft have performance information contained in the Flight Manual, but this information does not take into account the effect of surface condition or runway slope. (Most contain corrections for density altitude, aircraft weight, and surface wind.)

Use the Flight Manual data to determine the takeoff distance to 50 feet. Then correct this for the type of surface, the slope, and whether it is wet or contaminated. You can correct for these factors by using the following tables (the information is also contained in AC91-3). The factors are cumulative, but they can be applied in any sequence without affecting the final figure.

Runway Surface Factors

Surface type	Takeoff distance factor	Landing distance factor
Paved	x 1.00	x 1.00
Coral	x 1.00	x 1.05
Metal	x 1.05	x 1.08
Rolled earth	x 1.08	x 1.16
Grass	x 1.14	x 1.18

Runway Slope Factors

Direction of slope	%age slope	Takeoff distance factor	Landing distance factor
Up hill	1	x 1.05	x 0.95
	2	x 1.10	x 0.90
	3	x 1.15	x 0.85
Down hill	1	x 0.95	x 1.05
	2	x 0.90	x 1.10
	3	x 0.85	x 1.15

Wet and Contaminated Runways

Surface type	Takeoff distance factor	Landing distance factor
Wet or contaminated	x 1.15	x 1.15
Long grass (see note)	x 1.15	x 1.15

***Note**: The effect of long grass is unmeasurable, but if you do need to operate off a runway with long grass, it is recommended that, as a minimum, you apply the corrective factors as for a wet or contaminated runway.*

GPS — Godlike Piloting Skill?

SHARE YOUR EXPERIENCE

Low Battery. "Bing". And that was it. No GPS. I was at the northern end of Lake Taupo heading for Rotorua. The skies were clear and the route was now easy pickings from the chart on my knee, but if the Garmin's battery had failed a few minutes earlier, it would have had my undivided and sweaty attention.

The trip from Paraparaumu to Rotorua was becoming a regular event. Besides navigation over deceptively high ground, much of it featureless Tiger Country, the big issue is always fuel.

In many ways fuel is a simple matter. If you're going to fly on half a tank, fly on the top half, my old instructor used to say. However, the tank in a single-seat Pitts Special provides only 72 litres of useable fuel. In the 180 hp S-1S throttled back and leaned back, that provides about 1 hour and 45 minutes plus reserves. The trip between Paraparaumu and Rotorua usually leaves me with 20 litres remaining.

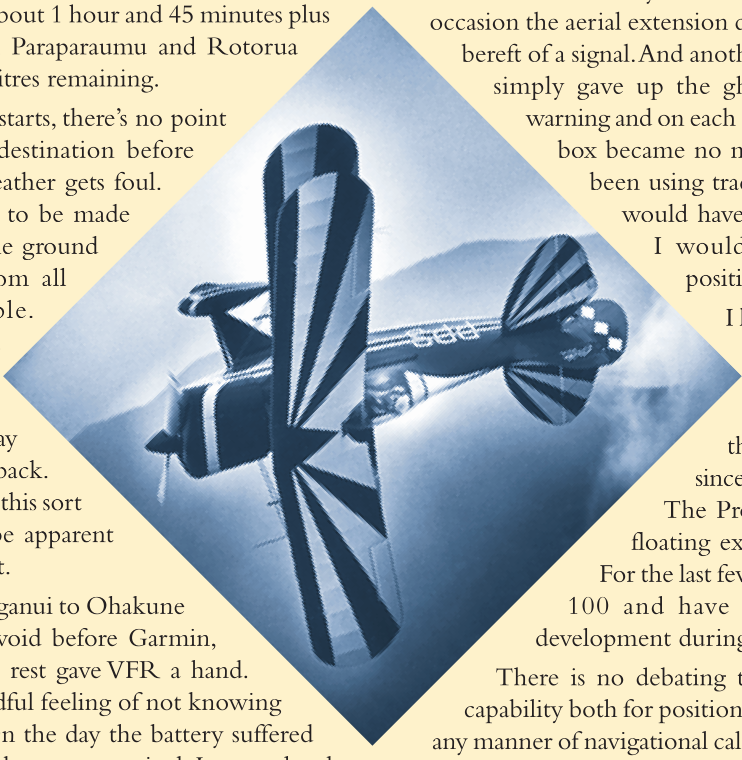

Photo by Dave Hansford, Dominion

It means that once a flight starts, there's no point in almost getting to the destination before turning back when the weather gets foul. Instead, the decisions have to be made before the aircraft leaves the ground and regularly updated from all the information available. If in doubt, don't go. Ohakune, on the north- or south-bound trip, is about final decision point. If the way forward is not certain, turn back. These kinds of calculations, this sort of fuel awareness, should be apparent in any aircraft, on any flight.

The flight inland from Wanganui to Ohakune was the sort we used to avoid before Garmin, Trimble, Magellan and the rest gave VFR a hand. There was always that dreadful feeling of not knowing exactly where you were. On the day the battery suffered premature senility, the weather was marginal. It was a lovely day in Paraparaumu. It was a very pleasant day in Rotorua. As is often the case, the bit in the middle wasn't so hot.

The cloud started to settle in long before Ohakune. I went around a bit, over the top of a bit and around a bit more. To my left, it was clear to New Plymouth. To the northwest it was clear to Hamilton. The escape routes were wide open. But the volcanos were shrouded in cumulus that grew thicker and higher by the mile. I found myself diverting further and further out to the west. In days gone by, this wouldn't have mattered, but with this new course deviation indicator thingy it takes nerves of steel to forget about keeping it centred. My desired track was now somewhere way out to the right, lost in cloud. For some reason this mattered. The biggest issue was not space — but time.

I never fly with the GPS without tracing the course on a chart and following the route just as always. I looked down to my right — the Raurimu Spiral was right below. It was perfectly clear to the north, I could almost see Hamilton. Darned if I could see Lake Taupo. Or the volcanos.

I fingered a couple of keys and pressed GO TO for Rotorua. The Garmin was giving me all the comforting information I wanted. Distance. Bearing. And best of all — Estimated Time En Route. Yep, I was relying on it. But VFR pilots are not supposed to rely on nav aids.

More clouds to go around. More nail biting. Slipping around cumulus towers was the stuff of all our childhood dreams, but those imaginings never involved sweaty palms. Another 100 or so litres would go down really well round about now. Divert? And then I spotted Lake Rotoaira out to my right. Another kink around some cloud and Lake Taupo appeared. And then there was no cloud.

Then the battery went bink.

That was the first time my GPS died during a flight. On another occasion the aerial extension developed a fault and left me bereft of a signal. And another time the electronic brain simply gave up the ghost. There was never any warning and on each occasion, the expensive black box became no more than ballast. If I hadn't been using traditional piloting skills, there would have been times where, at best, I would have been guessing my position.

I have used Global Positioning System ever since Garmin was Pronav, rapidly concluding that this was the best thing for navigation since Noah invented the compass. The Pronav was sold along with a floating excuse for tearing up money. For the last few years I have used a Garmin 100 and have benefited from software development during the intervening years.

There is no debating that GPS has extraordinary capability both for positioning and for making instantly any manner of navigational calculations. The ability to keep constant track of groundspeed and the time to destination has taken as much of the doubt out of flying as those course deviation symbols.

But the VFR pilot has to remember that the black box is not a substitute for good piloting and, instead of being the pilot's best friend, the GPS course symbol could become an invitation to disaster. In the United States there were so-called LORAN accidents where light aircraft smacked into hillsides dead on track. There's many a case of VFR pilots, myself included, who have pushed on into marginal weather because they had a GPS at hand. Without one, we'd have never got ourselves into such trouble. We abdicated responsibility to a 20-cent chip from Taiwan.

The point is this — it's no use knowing exactly the spot where you are going to die. There's no excuse for a VFR pilot ending up in bad weather. GPS **does not** stand for Godlike Piloting Skill. The old ways of navigation and piloting must still be used. The charts, the Mark 1 eyeball, and an alert brain, are still the VFR pilot's best navigational tools.

And the best cure for sweaty palms is the engine drawing fuel from a full tank.

Martyn Gosling

Helicopter Low-Level Operations

We recently received a letter from John Funnell concerned about low-level helicopter operations behind powerboat races. He wrote:

> "I recently observed (on television) the powerboat races in Auckland in which one of the boats overturned and the driver, or the navigator, was saved by a crewman jumping from the helicopter. I understand this rescuer is to be recognised for his efforts, and I would wish to endorse this action.
>
> "However, I am concerned to see the level at which these pilots are operating. As the footage showed on television, when the boat reared up backwards there was some risk of a collision between the boat and the helicopter. Fortunately, the pilot was able to pull up and away from the overturning boat. I think we need to educate these pilots that they are dramatically increasing the risks by travelling so low to the water at high speed.
>
> "This is something I'd previously become concerned about while watching the powerboat race on Lake Taupo, where again the helicopters were travelling close behind the boat and at altitudes of sometimes less than 50 feet above the water."

Some years ago, during a New Zealand-wide jet-boat race, the same practice led to the loss of one of the helicopters chasing the boats. Flying along a river, outside the pilot's own normal area of operations, the helicopter struck a wire and ended up with the boats in the river. Imagine climbing wet and embarrassed out of the river in full view of several TV cameras — not a picture that one wants shown on the national news. Fortunately in this case embarrassment was the only injury suffered by the pilot.

The latest incident involved a harbour race, and there are considerable risks involved in low-level flight over water. Not the least of these is the very real risk, if the water is calm and the surface glassy, of finding oneself under the water — rather than over it. When flying at high speed, a moment's inattention, whether with or without depth-perception cues, could mean a watery end to the flight.

Rule Part 91 allows aircraft to fly — for a "bona-fide reason" — below the minimum altitude of 500 feet away from populous areas. However, a lateral separation of 500 feet from "any person, vessel or structure not associated with the operation" is also called for, and the flight must be "performed without hazard to persons or property". If a helicopter is following an individual boat, then the pilot must maintain the required separation from any of the other boats to comply with the rule. Regardless, safety must not be compromised.

With the modern camera's ability to focus on objects from 1000 feet distance with the same clarity that older cameras could only get at 50 feet, there should no longer be a reason for the type of risky flying that was evident in these situations. ■

Mount Cook/ Westland Chart

Thinking of making a flight to view the spectacular snow-covered scenery around Mount Cook? Then you should have a copy of the Mount Cook/Westland Supplementary Air Navigation Chart (SANC).

This special edition 1:150 000 scale chart has been developed in conjunction with local users, and it includes all the Visual Reporting Points in the VFR Special Procedures area.

It is an important aid to anyone planning a flight into this beautiful, but high-density-traffic area. Do your homework before your flight — study this chart and the information in the VFG before setting out.

The chart is available from Terralink NZ Ltd. The map itself costs $20.00 but you will need to add postage and packing (90c standard post or $2.50 courier charge). Call with your credit card details or send your cheque and order to:

Map Centre
Terralink NZ Ltd
Private Bag 903
UPPER HUTT
Telephone 4–527 7019
Facsimile 4–527 7246

A 10 percent discount is offered for 50 or more charts in the same order.

Please note that the Map Centre now accepts credit card orders.

Safety Seminars

We are gearing up for this year's round of Safety Seminars. **Heli-Kiwi Safety Seminars** will run during winter, and **Aero-Kiwi Safety Seminars** will be scheduled mainly during spring.

This year, some seminars will be scheduled on weekday evenings and some on Saturday or Sunday mornings.

The decision-making theme will be developed further this year, with emphasis on various aspects of stress and how stress can affect our decision-making. We all have to make decisions every day about many different things, and it is possible to improve one's decision-making skills through knowledge and awareness of the factors which can affect our thinking.

The presenters are all experienced and respected pilots from the New Zealand aviation industry who, with the support of CAA, are giving their time, expertise and wisdom to help make a difference to aviation safety. They will be able to give simple and practical advice derived from their many years of experience.

While each of the fixed-wing and rotary-wing seminars will have a slant towards those particular types of operations, they are open to all. And, not just pilots — you may be an engineer, non-flying manager or connected in some other way to the aviation industry. These seminars will be of benefit to **all** in the aviation industry — **we urge you to attend whichever type of seminar is close to or most convenient for you.**

Dates and places for the seminars will be promulgated shortly. They will be published in *Vector* or *CAA Review* and also in the aviation calendars in *NZ Wings* and *NZ Aviation News*. In addition, watch for posters at your local aviation organisation.

Aero-Kiwi and **Heli-Kiwi** — making common sense common practice.

See you there!

Situational Awareness

What Is It?

What is situational awareness? In simple terms it is being alert to all the clues which can tell you of factors around you which may affect your flight situation. It is keeping an overall picture in your mind. This means staying in tune with your aircraft, the environment (weather changes, etc, some of which may be subtle), and your planned exercise or task. It also means staying in tune with yourself and how you are handling the situation; are you concentrating too hard on the task and missing clues to a changing situation?

Maintaining situational awareness is something which should be instilled in students from an early stage. There is a lot to absorb and deal with during the learning stages, and simply flying the aircraft can take most of our concentration. But, it is essential to remain alert to other factors around us.

The Scene

A student pilot was carrying out solo circuit practice at an unattended airfield with light traffic. At the beginning of the session the wind was a light westerly drift — commonly experienced at this airfield in the morning, whereas later in the day there was generally a shift to a northeasterly sea breeze.

While the student was carrying out touch-and-go landings in the westerly direction, the wind slowly died out and then picked up from the northeast. It rose to about 10 knots, and the resulting downwind component meant that the landings were getting faster and flatter, the following liftoff moved further down the field, and the climbout was flatter with less and less clearance over the fence at the far end. The pilot, however, dutifully made downwind calls and continued to persevere with the touch-and-go circuits.

Following the wind change, two aircraft joined overhead and landed (being forced to land downwind to conform with the circuiting aircraft). Both made normal radio calls, and the second one attempted to establish contact with the circuiting aircraft to try to avoid having to make a downwind landing. All to no avail. Further attempts were made to contact the aircraft from a base radio with no success, leading to the assumption that the pilot must have the volume control turned down.

As aircraft from another organisation were waiting to carry out circuits into wind, the final solution to stop the circuiting aircraft was to stand on the runway and flag the pilot down.

So, how could this happen. How many clues to the changing situation did this pilot overlook?

The Analysis

Firstly, what happened to the finals checks, including "check windsock", on each approach? This one action would have prevented the possibly dangerous situation developing — assuming the pilot reacted to the changing wind indication.

There would also have been more subtle indications that something was different — why do I seem to be landing faster? It is getting harder to make a good fully stalled landing, when I have to hurry to get power on to take off again in the distance remaining. Mindset perhaps? Determined to get an hour's solo circuits in the logbook? But is a touch-and-go necessary every time? It is usually a good idea to interrupt these with full-stop landings — practice of after-landing and pre-takeoff checks is also important.

There must have been other clues too. Although dutifully making downwind calls, was it not odd that although other aircraft were joining and landing, the radio was ominously silent? Or, heaven forbid, was there tunnel vision on the task in hand — and the pilot did not even see the other aircraft!

You may say "what a dipstick — that wouldn't happen to me"! But think about it.

The Lessons

If you are a new student, take note of these clues, and aim to be aware of similar factors which could occur in your flying lessons, dual or solo. Your instructor should give you guidance.

If you have more experience, remember the lessons are the same. While you may not get caught by some of the factors in this example, in situations where your knowledge, skill and ability is stretched, it is easy to become overloaded and overlook some key elements of a subtly changing situation. For instance, a cross-country flight over unfamiliar terrain, with airspace and weather problems thrown in, is often a good recipe for incidents — and sometimes accidents.

So be careful out there — and maintain good situational awareness at all times. ■

Caution isn't cowardice – nor is carelessness, courage.

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

Accident Notification

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CAA Act requires notification "as soon as practicable".