

VECTOR

Pointing to Safer Aviation

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January – Out Of Practice (OOPs)

The following article has been contributed by John Nicolson of Timaru, in which he describes his observations on general aviation accident trends in New Zealand over the summer period. Our research into monthly accident statistics over the last two decades (see graphs) supports John's comments. There is indeed a correlation between the number of general aviation accidents and the holiday season. In his article John investigates why.

Being aware of the relatively inflated number of air accidents occurring in the month of January (the so-called silly month) as noted in the New Zealand general aviation sector, I decided to examine the scene in the hope of identifying any leading contributing factors. I checked a total of 29 accident reports (24 CAA and 5 TAIC).

Numerous facts emerged very early in the research. The first, and probably the most transparent, was the pilots' contribution – pilot error (the human factor) – which totalled 21 (72%). **That's fact one.**

The next stand-alone truism to be detected was that pilot experience (as opposed to proficiency) did not figure at all in the accident contribution formula, and neither did any specific aircraft type show up as being more involved than others. From this I concluded that anyone, at any level of flying experience, in any type of aircraft, can become involved in an accident during January. **That's fact two.**

So why should January habitually stand head and shoulders above all other months for air accidents? With no glaring accident advancement indicators of a remarkable nature, I had to return to a previous observation, that it's likely to be a matter of insufficient pilot competence and proficiency – **Out Of Practice, OOPs.** There's a distinct air of relaxation for most of us during the Christmas holiday

interval, during which time the usually attentive personal disciplines are in the recharge mode – an uncompromising 'out-of-character' theory in the making.

While pondering the aberrations of a probable downturn of sound personal disciplines, I came upon an aviation buzzword – distraction. Distraction (being sidetracked, or not concentrating) can explain, but not completely justify, a whole host of pilot wrong-doings, both on the

unfavourable weather conditions. Distracted by the crew's continued and thwarted attempts to maintain radio contact with a ground station, the captain failed to recognise the probability of high terrain ahead which would mar radio reception. And, late into the letdown procedure, the captain became distracted from maintaining safe flight progress because of an uncertainty as to his actual position.



Photo courtesy Christchurch Star.

ground and in the air. I suspect, however, that all the ungodly divisions of distraction are more likely to come to pass in the cockpit during flight.

In fact, I reckon pilot distraction during a pre-accident chain of events has a lot to answer for. I can't forget the bewitched DC-10 crash at Mt Erebus – a classic example of a line-up of pilot (and crew) distractions which finally resulted in the tragic loss of 257 lives. Distracted by the wish to allow his passengers to view the exquisite scenery, the captain traded the safety of height and descended into

The month of January heralds the arrival of inherent joyriding buddies and relatives – or maybe a flight home in the Cherokee is scheduled. It appears, by reading between the lines, that there remain a few of us who think three circuits alone will invigorate pilot competence and proficiency. So, off we go on the January cross-country, soon to discover that our long distance navigation skills and our altogether flight management abilities do not equate to the existing conditions or situation. **OOPs!** Think about this. An American air accident study completed in 1996 and based on 300 training accidents in the private domain disclosed that 255 (85%) crashes were directly connected to **shabby pilot skills.**

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Next Issue

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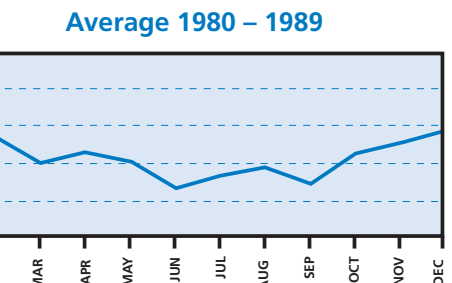
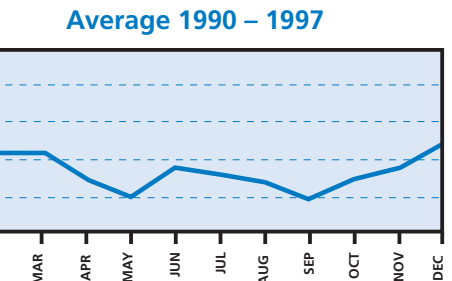
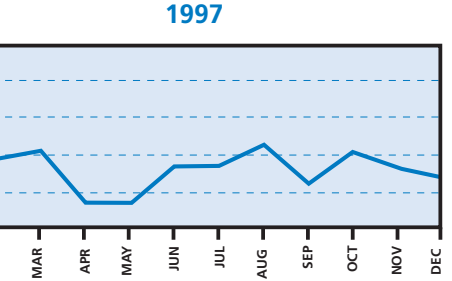
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Poor in-flight management made prominent inroads into my study. I settled for the notion that bungled in-flight management frequently became a measure of poor decision-making (momentarily off the planet) which ultimately invited disorientation and an unintentional breach of VFR safety parameters, including bad weather penetration.

A further breakdown of pilot error as a rampant contributing factor also exposed an uncannily increased proportion of questionable pre-flight preparation. I noted that nine (31%) of the 29 accidents involved strong indications of scant pre-flight preparation and planning. Hurried and feckless flight planning is a deadly cocktail and will surely lead to all of the virulent offshoots of a loss of situational awareness – another aviation buzz idiom which, frankly, means you've lost the plot. Convincing signs of the ignoble 'gotta get there' mentality – a mind-set which of course has no place in the cockpit – was noted in two accidents.

Incidentally, I originally presumed that January's climatic conditions might have provided a clue, but I subsequently dismissed this viewpoint. On closer analysis, this supported only my theory of suspect flight management and second-rate pre-flight readiness.

Modern pilot training developments, together with a throng of on-going excellent CAA pilot education initiatives (and learning from other people's mistakes) for numerous pilots seemingly does not form part of their safeguard mechanisms against potential misadventure. I am at once reminded of the actuality that the



devil owns more than a lion's share of New Zealand airspace – in-house gossip has it at greater than 80 percent – and the embuggerance is we don't know where it is!

In summary I felt I didn't reach my research objective (no hidden agents revealed) other than to authenticate known facts. It goes to prove, I suppose, that whenever you think all's going well – ball in the middle and everything in the slot – give some thought to the captain of the 'unsinkable' *Titanic*.

Anyway, I say again – pilot error was the most common factor and, therefore, perhaps I've merely reinvented the wheel. So there's nothing wondrous, extraordinary or outrageous – **OOPs** – about the aviation month of January.

And that's fact three. ■

IFR Pilot's Quiz

Question: Which of the following is correct with regard to terminating an IFR flight plan at an uncontrolled aerodrome?

- 30 minutes after the completion of the flight
- As soon as practicable on completion of the flight
- 15 minutes after the completion of the flight
- With the aerodrome in sight
- When you get home

Answer on page 8.

Currency, Type Ratings and the BFR

Becoming familiar with an aircraft through the type-rating process, and the maintenance of currency, are both extremely important aspects of aviation safety. The following article discusses pilot currency, type ratings and biennial flight reviews (BFRs) and provides guidance on maintaining proficiency in these areas.

Pilot Currency

There is nothing like being a current pilot – it provides a feeling of competency and satisfaction and will result in safer flying practices. An important part of holding a pilot licence is ensuring that you keep current with all aspects of the type of licence that you hold. The less often you fly, the more effort you will need to put in (especially if you have financial or time constraints to consider). You should remain familiar with your charts, the AIP, the Rules, flight planning procedures, and currency requirements – to name but a few.

If you do not fly very often, you should put plenty of thought into how you are going to keep current – especially if you plan to take passengers on cross-country flights. Even though, to exercise the full privileges of your licence, you need to complete only three pilot-in-command takeoffs and landings every 90 days and a BFR every two years, you must still ask yourself, **is this sufficient to remain safe?** The answer, in many cases, will probably be **no!**

A basic guide to maintaining safe flying currency is to aim to fly an hour once every two to three weeks (say 20 to 25 hours per year) as a minimum. Of course this is only an estimate, and ultimately you must log sufficient flying hours to feel totally competent about your abilities as a safe pilot. If you find that 20 to 25 hours per year is insufficient to maintain a satisfactory level of currency, and you can't afford any more, then some of your hours may need to be with an instructor who can help you 'brush up'. Remember that it is part of the **responsibility** of holding a pilot licence to make sure that you truly are 'up to speed' – especially for your passengers' sake. **Only you** will know if you truly are.

There are different types of flying currency that a pilot might have at any one time – local flight currency, training exercise currency, operational currency, and cross-country currency are examples. You might be proficient at circuit work and handling an aircraft but may not have completed a cross-country flight for some time. If this is the case, then you should be careful in selecting what type of flight you undertake away from home territory. A cross-country

flight down to Fiordland may not be a good idea if you have not had a lot of recent cross-country and mountain flying experience. This would apply even if you have been flying on a regular basis in your local area. Our advice is to choose a more modest and achievable trip before tackling the tougher exercise.

The same amount of caution should be applied to night currency too. Part 61 of the Civil Aviation Rules allows you to carry passengers at night provided that you hold a night rating, have completed three pilot-in-command takeoffs and landings at night in the previous 90 days, and are current by day or night on the aircraft you wish to fly at night (see rule 61.37(c) for further details). If you, or your instructor, feel that there is a significant difference between the aircraft that you wish to fly at night and the aircraft that you are current on at night, then you should probably have a dual check at night in that aircraft. Things can look quite different at night in an aircraft type that you are not totally familiar with.

Unless you are flying on a regular basis, it is best to confine most of your flying to one or two types of aircraft rather than trying to maintain many different type ratings. Being familiar on one sort of aircraft enables you to ensure a higher level of currency and, ultimately, safety.

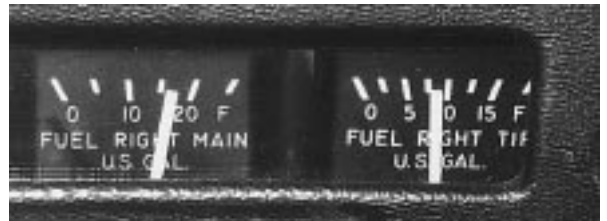
Type Ratings

A Cherokee Six (PA32-260) departed from a destination aerodrome for its home base with the wing-tip tanks filled to capacity (64 litres in each) while the main tanks had 26 litres each. The pilot had flown the aircraft to the destination aerodrome with the left tip tank selected and had then selected what was believed to be the right tip tank for the trip home. Pre-landing checks were completed two nautical miles from the home-base aerodrome. While on approach at 600 feet agl, the engine stopped without warning. Emergency checks were carried out by the pilot in an attempt to restart the engine. These included checking what the pilot believed to be the selection of the right tip tank. Unable to reach the runway, the

aircraft landed heavily in a paddock half a mile short of the runway. The pilot had selected the right inboard tank, mistaking it for the right tip tank. This incorrect selection of fuel tanks was found to be one of the accident causes.

In another example, a recently graduated PPL undertook a type rating on a PA32-260 prior to taking a full load of passengers on a short scenic flight. The PPL, whose flying experience was mostly on Cessna 152s, took several hours to complete the type rating. It comprised a review of the aircraft handling notes, completion of a technical knowledge sheet, and approximately two hours of dual instruction. The flying covered general aircraft handling exercises followed by circuits at maximum all-up weight.

At the end of the scenic flight, while on a left base turn, the aircraft engine stopped. The aircraft sustained substantial damage during the forced landing in a nearby paddock, and some of the occupants received moderate injuries. CAA investigation revealed that the accident had resulted from fuel starvation through mishandling of the fuel system.



These accidents highlight the importance of being totally familiar with an aircraft and its systems. There have been a number of accidents in New Zealand, similar to the ones mentioned above, in which insufficient familiarity with aircraft systems, or with handling characteristics, have led to an accident.

The process of issuing a thorough type rating must certainly play an important part in preventing such accidents or incidents. This is particularly true in the case of less experienced pilots who may not have the same level of general flying knowledge as their more experienced colleagues. It is important to ensure that type ratings are conducted comprehensively – and are tailored to the experience level of the pilot concerned.

Continued over...

Type-Rating Requirements

Aircraft type-rating requirements, as laid down in Part 61, state that to be eligible for an aircraft type rating the pilot must:

- Hold a current pilot licence.
- Demonstrate to an appropriately qualified instructor the ability to perform competently all normal, abnormal and emergency manoeuvres appropriate to the aircraft type for which the rating is required.
- Demonstrate to an appropriately qualified instructor a satisfactory technical knowledge of the aircraft type that the rating is required for.
- Be signed off in the pilot's logbook in a form that is acceptable to the Director. (In addition to this, pilots may elect to have their ratings printed on the back of their licences by sending the appropriate form and fee to the CAA.)

In addition to the above, CAA Advisory Circular AC61-1 outlines the minimum experience requirements for different type ratings. Some examples of these requirements are:

- For a single-engine aircraft below 5700 kg MCTOW, 30 minutes of dual instruction.
- For multi-engine aircraft below 5700 kg MCTOW, five hours for the initial issue and then one hour for each subsequent rating.

These are **minimum** experience requirements, and they will normally apply only to pilots converting between very similar aircraft, or to pilots who are relatively experienced. Several hours – or more – would be an average figure for the rest of us. The final figure will ultimately be determined by the instructor concerned, who will need to be satisfied that the individual pilot is competent.

Type-rating requirements can vary significantly from aircraft to aircraft too. Conversion time from a low-wing type of aircraft to a high-wing type, for example, may take longer if the pilot has not flown a high-wing before – and vice versa.

The old group-rating system was replaced in 1992 by the individual logbook rating system. The new system, which is governed by rule 61.55, requires each type rating to be conducted in accordance with Part 61 and Advisory Circular AC61-1 and to be signed off in the pilot's logbook

before the rating can become valid.

Under rule 61.55(c), pilots may elect to gain an additional type rating in an aircraft that is "... so similar as not to require any further conversion instruction". This will apply if the aircraft type concerned has no significant performance or handling differences. It is ultimately up to the instructor to determine whether and how much conversion training is necessary for any particular pilot.

It is important that instructors assess a pilot's individual needs, experience, and ability before embarking on an aircraft type rating. The pilot must be honest in letting the instructor know how competent they feel in the aircraft before the rating is signed off.



The following is a guide as to what to expect as part of the type-rating process:

- An aircraft technical knowledge sheet applicable to the aircraft concerned must be completed. This will include things like: flight manual documentation; location of the emergency equipment; fuel systems; operation of aircraft instruments and controls; and performance characteristics – including performance charts, normal operating speeds, operating limitations and a weight-and-balance calculation. The majority of this information can be found by consulting the aircraft Flight Manual, asking the instructor, or checking the aircraft. The primary aim of the technical knowledge sheet is to gain knowledge – it is **not** a test. It should be retained by the pilot in a safe place for further reference.
- A standard type-rating conversion onto an aircraft that does not have a variable pitch propeller (CSU) or retractable undercarriage, for example, may take several hours. The airborne portion will usually cover: the aircraft at the stall in different configurations; most aspects of climbing, descending and turning; forced landing from altitude; engine

failure after takeoff (especially the emergency procedures applicable to that aircraft); and all aspects of circuit work, including maximum performance takeoffs and landings at aerodromes of minimum length. These will enable the pilot to examine how the aircraft behaves in situations that they may encounter in their day-to-day flying.

- Type ratings for tailwheel aircraft, multi-engine aircraft, biplanes, aircraft with CSU or retractable undercarriage will normally take longer. Ratings on multi-engine or tailwheel aircraft generally require additional training until proficiency is gained – because of their greater complexity or the

greater potential for things to go wrong. The instructor must feel comfortable that the pilot can handle the aircraft in different situations before issuing the rating.

Before taking any passengers, it can be a useful exercise to invest in a modest amount of solo consolidation flying on the aircraft that you are newly rated on. This gives you the opportunity, while on your own, to see how the aircraft behaves and to become increasingly comfortable with it. Circuits in a moderate crosswind, for example, can improve those all-essential stick and rudder skills.

Type ratings can be re-validated by completing three solo (no passenger) takeoffs and landings in the applicable aircraft. If you have not flown that aircraft type for some time, then a short dual flight before conducting your three pilot-in-command takeoffs and landings is a good idea. If you are only just over the 90-day limit, then solo circuits (and any other kind of exercise) could be sufficient – provided that the conditions are within your personal limits. Note that if you have completed an issue flight test (eg, PPL or CPL) within the preceding 90 days, the three solo circuits are not required.

The BFR

The New Zealand biennial flight review, or BFR as it is usually known, is based on the American FAA system and is a requirement for all Part 61 licence holders every two years in order to exercise all the privileges of their pilot licence. It is intended to ensure that all pilots are assessed on a regular basis by an A or B Category instructor (apart from certain special applications). The instructor can not only gauge the flying proficiency of a pilot in a wide variety of emergency situations, but also can refresh their technical skills at the same time. The BFR will usually be tailored to the type of operation that the pilot is involved in. It should be noted that the BFR **does not** replace the type-rating requirement for recent experience within the last 90 days.

The syllabus for a BFR should be based on a flight test for the highest grade of licence that is required by the pilot to be kept current. For example, if you hold a CPL then the basis of your BFR will be conducted around the operational requirements of a CPL. This may include local knowledge and procedures that are specific to your type of operation. A slightly different emphasis may be placed on each successive BFR, so as to explore the different aspects of your commercial operation.

It is sensible to choose carefully the type in which you do your BFR. If, for example, you do the majority of your flying in a multi-engine or tailwheel aircraft, it is probably wise to have your BFR in the respective aircraft type. Such a decision is worth discussing with the instructor conducting the BFR so that the correct emphasis is applied during the review – BFR requirements will differ from individual to individual. The instructor (or you as the BFR candidate) may elect to conduct the BFR in a different aircraft each time to avoid a standardised format and provide the greatest safety benefit.

When your BFR is due, you need to start preparation several weeks before the due date – especially if you are not particularly current. Organise a dual refresher flight or two, and spend a few hours getting up to date with the documents. Your flying skills will improve, and you will feel more confident about taking the BFR.

Private Pilot BFR

A BFR for the Private Pilot should ensure that the majority of the Private Pilot flight test syllabus is covered. This is particularly important in the case of a PPL who does not fly regularly and may not be current with emergency procedures or new rules. The following are suggestions as to the likely content of a Private Pilot's BFR:

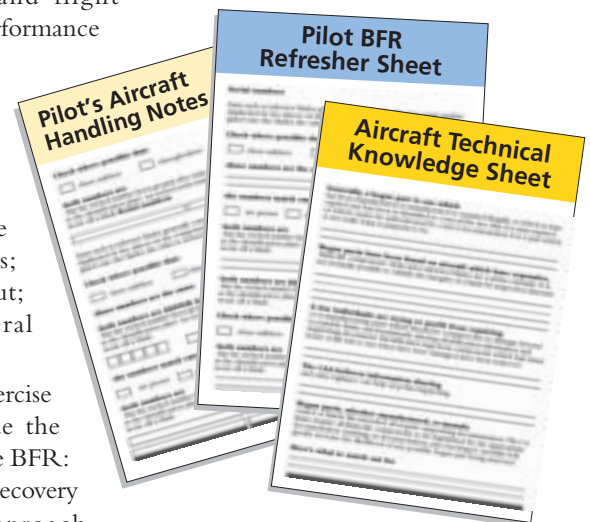
- The pilot completes a refresher questionnaire sheet which details information on: meteorological minima, eg, visibility requirements; interpretation of weather and AIP documents; fuel and flight planning requirements; performance charts; technical aspects of the aircraft; right-of-way rules; pilot currency requirements; and emergency procedures.
- Assessment should be made of pre-flight procedures; ground handling; lookout; radio work; and general piloting standards.
- Where appropriate, air exercise assessment should include the following as the basis of the BFR: engine failure after takeoff; recovery from a high or low approach and the subsequent overshoot; forced landing without power; advanced stalling exercises; turning; precautionary landing within a low-flying area; and general circuit work.
- Additional exercises could include: crosswind circuits; landings at aerodromes of minimum length; maximum performance takeoffs; and handling the aircraft in the bad visibility configuration.

These are all examples of skills you will be expected to be familiar with.

The BFR should conclude with a structured debrief by the instructor as to

the positive and negative aspects of the flight. The instructor can indicate areas with potential for improvement and provide clarification of any problems on the spot. Do not rush this process; take full advantage of your instructor's knowledge to clear up any grey areas.

Although the BFR is not a flight test, it should be regarded as a reasonably serious type of flight review – one which requires good preparation beforehand. The BFR should then become simple confirmation of a pilot's flying abilities and familiarity with procedures and relevant documents.



Your flight training organisation should alert you as to what to expect as a BFR candidate. If not, then ask them the specifics of what is involved. This will ensure that you know what you are aiming for and will allow you to prepare sufficiently.

Commercial Pilot BFR

A BFR for a Commercial Pilot will, of course, be conducted to a higher standard than that for a Private Pilot. The public expectation of a Commercial Pilot is that they will have undergone regular flight checks to the highest standard.

A Commercial Pilot BFR should follow a similar format to that discussed above, except that it will be tailored to specific commercial operational requirements.

Commercial pilot BFRs may be conducted in conjunction with an annual Flight Crew Competency Check as outlined in the CA Rules for certificated operators. This replaces the old Reg 76 Check and, if desired, should be requested by the pilot concerned. It is then up to the instructor or flight examiner's discretion as to whether they feel it is appropriate to that

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type of operation. The Flight Crew Competency Check must be agreed to beforehand, and generally it will consist of an operational flying check (outlined by the instructor/flying examiner before the flight) to the satisfaction of the instructor/flying examiner. The BFR and Flight Crew Competency Check must each be separately signed off in the pilot's logbook. Note that the examiner who conducts the Flight Crew Competency Check may sign off a BFR only if they hold a current A or B Category instructor rating (except in an airline situation, where a D Category instructor is able to conduct BFRs for pilots employed by the airline).

For a commercial operation, the BFR is designed to assess the pilot's general flying abilities and familiarity with emergency procedures and documentation. The Flight Crew Competency Check focuses on procedures that are more specific to the commercial operation. The latter check will usually involve flying at least one route segment and one or more landings at aerodromes representative of the type of operation; it will include all associated paper work.

If a pilot requires a six-monthly instrument rating check (in conjunction with their BFR) then the instructor or flight examiner may decide that several instrument approaches followed by air exercises such as stalling, turning, forced landings (for single-engine aircraft) followed by circuit work will suffice for the BFR portion of the flight. The decision to combine several assessments together depends on each individual situation and will ultimately rest with the flight examiner.

Summary

Pilot currency, type ratings and BFRs will always be an integral part of the aviation safety system. The less a pilot flies the more important they become. The present licensing system is designed as a lifetime licence package. To use the licence, Part 61 requires that pilots remain current, but it is still up to the individual

to make sure that they truly are 'up to speed' with all aspects of the flying that they wish to do. If you have any doubts about certain aspects of your flying abilities, then it may be useful to discuss them with an instructor; also, consider taking some refresher training.

Next time you are planning a flight, such as a rather ambitious type of cross-country, take a few moments to think whether or not your skills and level of currency match the task. ■

The currency bookmark is a useful reminder to determine when BFRs and medical checks are due. It also reminds you about the 90 day pilot-in-command currency requirements. It should be kept in your pilot logbook and with your licence as indicated. The bookmark can be obtained from most flying clubs or an Aviation Medical Assessor.



Tomahawk Postscript

After our article on the Piper Tomahawk in *Vector* (1997, Issue 3, page 13), we received some correspondence from Lew Day who was involved with the Piper Tomahawk when the type was first imported into New Zealand. There have been further reports in some aviation publications regarding further testing required by the FAA (Federal Aviation Administration), and we have waited until these were completed before providing a follow-up item.

Reader Comment

The following are extracts from Lew Day's letter:

"The Piper Tomahawk was introduced to New Zealand by the New Zealand Piper agents, Airwork (NZ) Ltd, in November 1978. Waitemata Aero Club purchased the first three aircraft that month and, because of demand, added a fourth to the fleet three

months later. All these aircraft had only the outboard flow strips."

"I was involved in the flight testing, prior to the issue of the C of A, of all the aircraft imported by Airwork between 1970 and 1988 and had a particular interest in the PA-38 as a replacement for the Airtourer. All these aircraft were tested to the limits imposed by the Aircraft Flight Manual, and the Tomahawks sold by the agents were tested for their handling characteristics, including the spin and spin recovery. The Tomahawk is absolutely conventional. If it was not so it would have been rejected as not conforming to the standard techniques required for adequate pilot training."

"At no time has it been found necessary to use other than standard technique for recovery. At no time did the aircraft display any adverse pitching moments which could have required precise timing in the initiation of the standard recovery action."

Query to Piper

We wrote to New Piper Aircraft requesting information about reports that further flight testing regarding some stall and spin characteristics was to be carried out.

We also asked:

"We would also appreciate an answer regarding the reason for the lack of a pause in Piper's spin recovery advice. As you will see in the article, we surmised that this was because, with the Tomahawk's T-tail configuration, elevator movement would not have the same blanketing effect on the rudder as with a conventional tailplane. However, since writing the article we have noted that exactly the same spin recovery instructions are given in the Piper Cherokee Flight Manual. Can you please elaborate on what blanketing you believe may take place in a Cherokee and in a Tomahawk. Are they different, or did the practical flight testing not confirm the blanketing theory, which is commonly advocated?"

Piper Reply

We received the following reply from Peter E. Peck, Executive Engineer, The New Piper Aircraft, Inc:

“First, we here at Piper would like to compliment you and your staff for a very fair unemotional assessment of the flight and handling characteristics of the PA-38-112 ‘Tomahawk’ aircraft. It is refreshing to read such a factual and informative article in an aviation publication and we commend you for it.

“As a result of the notoriety generated by previous articles, the NTSB decided to conduct a careful review of the original substantiation flight test report for the aircraft, which was conducted prior to it being certified in December 1977.

“Although this review revealed no anomalies in the test results, it was noted that no results were presented to show substantiation of the full flaps (34°) configuration for FAR 23.203 Turning Flight and Accelerated Stalls, while the flaps retracted tests were included in the report.

“We believe that this was an inadvertent oversight in that these test results were not included because, prior to Amendment 14 of FAR 23, full flap tests were not required, and the PA-38-112 was the first Piper aircraft to be certified after promulgation of Amendment 14.

“Accordingly, the NTSB recommended that these tests be carried out in order to ensure that this configuration did not create any

controllability problems, and Piper and the FAA agreed to conduct these tests.

“These tests, which were conducted in Vero Beach by Piper between 29 August and 6 September 1997 and independently by the FAA Atlanta Aircraft Certification Office on 16 September 1997, showed that the aircraft exhibited no adverse handling qualities and was completely controllable in all weight-CG configurations for the clean, intermediate and full flaps, turning flight and accelerated stalls.

“The PA-38-112 aircraft used for these tests was N9246T, S/N 38-78AO294, and a conformity inspection revealed that the rudder cable tensions were below the minimum allowed, and both elevators were found to have cracks in the skins, which had been repaired by stop drilling and welding. The elevators were replaced and the cable tensions were brought within tolerance prior to these tests. As a result of these findings, the FAA intends to provide advisory information to the flying community concerning the importance of properly maintaining aircraft used for stall and spin training.

“Regarding the spin recovery technique which does not require a pause between full opposite rudder and forward movement of the control wheel, please refer to page 4-25 of the ‘Tomahawk’ Pilot’s Operating Handbook, which indicates that the pause between control movement is equally effective but causes more altitude loss prior to recovery. This was verified during flight

testing, hence the ‘no pause’ technique is preferred.

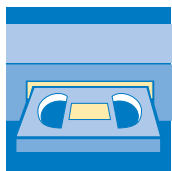
“I trust the foregoing information is acceptable.”

New Zealand Accident

Finally, in the previous article we stated that there were no known cases of Tomahawk stall-spin accidents in New Zealand. Further research has revealed one that involved a stall-spin event. The circumstances suggest no fault with the aeroplane.

In January 1986, after about 40 minutes of simulated instrument flying on a dual training flight, the instructor of the Piper Tomahawk took control and pointed out a local private airstrip to the student. An approach was made in the downwind direction, although it was apparent that a fresh northwest wind was blowing (windsock fully extended and wind estimated to be about 30 knots at the time of the accident). After a brief “touch-and-go” landing, on climbout with zero flap, the aircraft encountered moderate turbulence and a strong downdraught, causing loss of speed and height while flying into a valley ahead. Realising that the aircraft could not outclimb the terrain, the instructor commenced a left turn in turbulent conditions to fly out of the valley. During this turn the aircraft entered a spin, struck the ground and overturned.

The instructor and student suffered severe injuries. The aircraft was substantially damaged and soon after was taken off the register. ■



Videos

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

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”.

Seat Twist



I had noticed that there was a slight twist in the right-front seat-back of my PA28. It was most noticeable when you put some weight at the top of the seat-back when leaning over to either place or fetch something from the back seat. With a passenger in the seat, nothing seemed particularly out of the ordinary. The seat and seat-back moved with changes in load – but then they are mounted on rails and the front seats fold forward, so there will be some ‘give’.

A few days later I was cleaning the cabin, kneeling over on the walkway vacuuming, and a bolt-head rattled out from under the front-right seat. Where did that come from? Maintenance had been undertaken recently; had it been left or dropped? It may not even be from this aircraft? Fortunately a good search (and a torch is sometimes needed) turned up the rest of the bolt, the threaded part in the righthand base of the seat. It was the head of the shankless full-threaded bolt that is the seat rake adjuster on these PA28 seats. The bolt-head (which faces down) rests on a small lug on the base of the seat. The bolts (one on each side of the seat) can be wound in or out to change the front-seat rake angle. A check on the front-left seat also revealed a sheared head on one of the bolts. Perhaps the seat twist was less noticeable, as you tend to lean less on this seat getting in and out of a Warrior and don't lean across it as much.

The missing bolts were replaced at our maintenance organisation. This greatly improved the rigidity of the seat-backs. Discussing the incident with the engineer, he commented that the same system is used on the PA38 and that the bolts have been found to shear their heads in these aircraft too.

All this sounds minor, the replacement of a bolt. However, as pointed out by the engineer, with one bolt-head lost the load is transferred to other parts of the seat-back structure, which may be less able to withstand the load and which probably will distort the seat-back shape over time. Further, if the second bolt-head fails, there is little to stop the seat-back collapsing backwards – fully – going flat. That certainly could change your outlook. Most likely you will haul back on the yoke to check your fall and to pull yourself up. You will be well on the way into the classic pitch-up and stall.

I had a look at a few Cessna seat recline and adjustment mechanisms. They appear to be different and don't have this inverted bolt resting on a lug. I have looked in a number of PA28-151s and 161s and PA38s and found this system (a broken bolt in one other – remedied now). The system may be different in other Piper models. Equally, this simple system may be in other general aviation aircraft. If you find the adjustable seat in your aeroplane feels very loose in its back and appears to twist excessively, check for this type of adjuster and its serviceability. A bolt may just have headed off somewhere.

Ross St. George

Vector Comment

We suspect that most engineers inspect the seat's attachment (to the floor) and the seat belts fairly thoroughly. Some, however, may tend to gloss over those bits that are perceived as 'comfort only' items. ■

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Answer to IFR Pilot's Quiz from page 2.

Answer: As soon as practicable on completion of the flight – see rule 91.407. Watch for further information on this topic in a future issue of *Vector*.

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