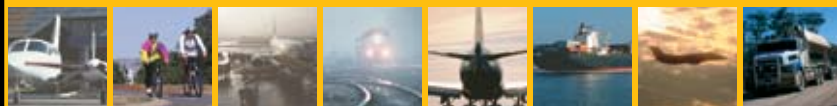




Australian Government

Australian Transport Safety Bureau

The Australian Air



Executive Director's Message

I am sure that readers know that the Metroliner aircraft accident at Lockhart River in north Queensland on 7 May was the fourth largest civilian aircraft accident since WW2. The two pilots and all 13 passengers perished. When the ATSB was notified of the accident we sent 9 investigators to Cairns that evening. The Emergency response



services reached the inaccessible site first and we managed to get three investigators in on Sunday afternoon—the day after the accident. They found both the cockpit voice recorder and the flight data recorder that day and these were carried to our Canberra laboratories for analysis. Our investigators worked on site for the following week mapping, documenting, and collecting evidence, in cooperation with others, including the Police DVI teams assisting the Queensland State Coroner.

In addition, we had people looking at both maintenance and company records at various locations, particularly Cairns and Brisbane, and worked with CASA to obtain those and also radar information out of Cairns. Unfortunately, there was no radar coverage in the accident area, but there is some CTAF audio that we are also looking at, as well as the Bureau of Meteorology data for the time of the flight, and the GPS approach.

Sadly, the cockpit voice recorder was found not to have recorded correctly, revealing only fragments of electronic pulses from earlier flights and we are seeking to establish why. Fortunately, the flight data recorder had good data. The ATSB's Preliminary factual report on the accident released on 3 June is available on our website.

Kym Bills, Executive Director

Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608

Telephone: 1800 621 372
Email: atsbinfo@atsb.gov.au
Website: www.atsb.gov.au

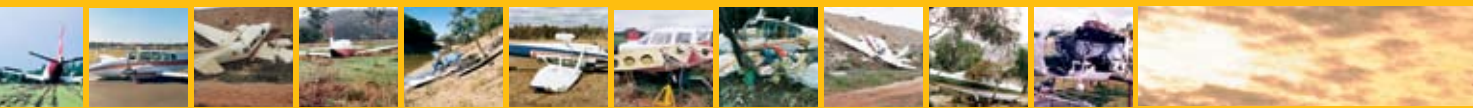
An Aviation Self Reporting Scheme (ASRS) form can be obtained from the ATSB website or by telephoning 1800 020 505.

Diploma of Transport Safety Investigation (TSI)

In 2002 the Australian Transport Safety Bureau (ATSB) was nationally accredited as a Registered Training Organisation (RTO). This status serves as the means to enable formalisation of the Bureau's minimum operational training requirements for all Transport Safety Investigators. Tertiary accreditation also enhances the ATSB's external credibility through the recognition of a formal qualification, the Diploma in Transport Safety Investigation. The TSI diploma is based on the Vocational Education and Training (VET) model and is a tailor made program purposely designed to produce 'an investigator in charge of a less complex transport safety investigation'. Trainees can expect to dedicate approximately 700 hours towards gaining the diploma, equating to approximately 12–18 months depending on progress through the following course components:

- **Recognised Current Competencies (RCC)/Recognised Prior Learning (RPL)** – The ATSB recruits experienced industry personnel (ie: in aviation terms, pilots, LAMEs, engineers, technical analysts, ATCs, cabin safety and human factor specialists) and these individuals bring a multitude of formal qualifications and skills. Therefore, it is necessary to establish which of these are relevant in context of the diploma, as this determines the workload, in terms of the following category.
- **Core Based Training** – This training is managed internally and is geared towards the liabilities/shortfalls identified through the RCC/RPL process and to specifically target those skills and knowledge required by our investigators including: human factors, coronial witness training, advanced OH&S (blood borne pathogens), media awareness, negotiating, interviewing, and technical courses in collecting, recording and evaluating evidence. Presently, there is mounting interest being generated by external agencies to participate in these courses. While some places are offered for OH&S and human factors training, the feasibility of offering external places for the full diploma is yet to be determined because of the on-the-job requirements including those noted below and the issue of whether it would detract from the ATSB's core investigation business. I have tasked our recently appointed training and development manager to remain cognisant of future such opportunities.
- **On-the-Job Training and Experience (OJT/OJE)** – To facilitate a safe working environment, investigators-in-training, initially attend job sites in the capacity as an understudy. There they are supported through a senior mentor program, with all formalised training conducted by either experienced diploma qualified personnel and/or trainers qualified in Certificate IV Training and Assessment. This training and experience represents a major element in finally determining the applicant's ability to satisfy all TSI diploma requirements.

One quarter of all ATSB investigators are now qualified with the diploma, with the remainder under enrolment. Gratifyingly, the October 2004 ICAO audit of the ATSB was very positive about the Diploma of Transport Safety Investigation. In 2006 the Bureau is hoping to launch an Advanced Diploma aimed at producing 'an investigator in charge of a more complex transport safety investigation' ie: a major accident type scenario. ■



Crash after takeoff at El Questro, Western Australia

ON 30 August 2004, shortly before 1200 WST, the pilot of a privately operated Cessna 421C Golden Eagle, registered HB-LRW, commenced his takeoff from runway 32 at El Questro Aeroplane Landing Area (ALA), Western Australia. Witnesses at the landing area reported that, shortly after lift off, the aircraft banked to the left before striking the trees to the side of the runway and impacting the ground. The aircraft was destroyed by the impact forces and post-impact fire. The pilot and passenger, the only aircraft occupants, were fatally injured.

The pilot was appropriately licensed and held the relevant aircraft and other endorsements for the flight. The last recorded refuel of the aircraft was the addition of 594 L of aviation gasoline at Broome on 27 August 2004. None of the pilots of the 18 other aircraft that also refuelled from that source on that day indicated having experienced problems with that fuel. The investigation team also quarantined a sample of that fuel for subsequent independent examination. That examination confirmed that the fuel was free from water and sediment, clear and bright, and conformed to the specification for Aviation Gasoline 100.

The pilot submitted a flight notification to Airservices Australia on the morning of the accident for a flight under the Visual Flight Rules from El Questro to Broome. The nominated endurance for that flight was five hours. That, together



with the estimated fuel remaining after the reported two hour flight from Broome to El Questro indicated that sufficient fuel was carried for the planned two hours 15 minutes flight to Broome.

Wind in the area was reported as being south-easterly at 5 to 10 knots at the time of takeoff. There were no dust devils or thermal activity reported in the vicinity of the runway at that time.

A charter pilot who was airborne in the area at the time of the accident reported that he did not hear a distress radio transmission from the pilot.

Inspection from the threshold of runway 32 to a point on the runway abeam the impact point revealed no evidence of any bird or other animal remains, gouges, scrapes or other abnormal ground marks, or detached aircraft items or components. In addition, there was no report by the witnesses to the takeoff, or evidence of an in-flight aircraft fire.

The aircraft came to rest about 106 m left of and abeam of a point about 888 m from the runway threshold. The general

location of the accident site is depicted at Figure 1. A severe post-impact fire consumed the majority of the aircraft and damaged the left engine. The right engine separated from the aircraft during the impact sequence and was located about 26 m from the main wreckage.

Disassembly and examination of the aircraft's engines failed to find any evidence of internal mechanical failure of either engine that would have prevented their normal operation prior to the accident. Technical examination of the propellers and propeller hubs indicated that both propellers were being driven by the engines during impact, and that both engines were delivering comparable amounts of power.

There was no evidence in the pilot's interim post mortem report to suggest that the pilot suffered any sudden illness or incapacitation that may have affected his ability to control the aircraft. At the time of this report, the pilot's final post mortem report was not available to the investigation team.

The above extract was drawn from the Interim Factual report into investigation BO/200403202. A full copy of the Interim Factual report is available on the ATSB website www.atsb.gov.au or from the Bureau on request. ■

Safety briefs

Taxiway confliction

Occurrence 200402622

On 2 July 2004 at about 1805 EST, a de Havilland DHC-8-315 (Dash 8) was taxiing to depart Sydney Airport on a scheduled fare-paying passenger flight to Williamtown, NSW. A Saab 340F had landed on runway 16 right and taxied from that runway via runway 25 and by turning left onto taxiway Bravo. The Surface Movement Controller (SMC) instructed the Saab to expedite. As both aircraft were about to enter the intersection of taxiways Golf and Charlie, the copilot of the Dash 8, seated on the right of the cockpit saw the Saab. He called for the PIC to stop. The PIC brought the Dash to an abrupt stop. The SMC was unaware of the situation until queried by the PIC of the Dash 8 regarding which aircraft had right of way.

A replay of the Surface Movement Radar (SMR) showed that the taxi speed of the Saab was 26 knots and the speed of the Dash 8 was 21 knots. The impression of both PICs was that the aircraft passed in very close proximity.

The investigation found that:

- other tasks may have distracted the SMC and limited his situational awareness
- the situational awareness of the pilots was reduced by the lack of specific traffic information on the other potentially conflicting aircraft
- the aircraft taxi speeds limited either crews' ability to react to a conflict in a known busy area of the airport
- the use of the term 'expedite' may have led to a fast taxi speed culture.

The Dash 8 operator reviewed their policy on the use of the company frequency during ground manoeuvring. The Saab operator reviewed procedures and issued two bulletins that amended the use of the company frequency during ground manoeuvring. The next Flight Operations Safety meeting will consider the requirement for a policy on monitoring aircraft groundspeed while taxiing. ■

Incorrect switch installation

Occurrence 200400998

On Monday, 22 March 2004, the pilot in command of the Fairchild Industries SA-227 aircraft, registered VH-HPE, operating a scheduled Regular Public Transport flight, reported that excessive force was required to maintain the nose of the aircraft down during departure from Sydney Airport. The trim selector was switched to the 'copilot' position and control was passed to the copilot, who was then able to trim the aircraft, and the flight continued to Taree, NSW. After landing, an examination by the crew revealed that the pilot in command's (left side) control yoke pitch trim switch was operating in the reverse sense from normal operation.



A subsequent engineering examination revealed that the pilot in command's pitch trim switch had been installed upside-down during maintenance to replace the left side control column pivot bearings.

The maintenance contractor and the aircraft operator conducted separate investigations into the trim switch misalignment and concluded that the only plausible scenario leading to the misalignment was that the engineers responsible for the pitch trim switch installation had installed the switch incorrectly. The discrepancy had not been detected during the installation and duplicate functional checks or the flight crew's pre-flight checks.

A number of procedural changes were made by the aircraft operator and the maintenance contractor to prevent a recurrence. ■

Incorrect remote control units

Occurrence 2004002287

At 1855 on 21 June 2004, two Boeing 717-200 aircraft, registered VH-VQB and VH-VQE, were being prepared for departure at adjacent gates 49 and 53 at Sydney Airport.

Both aircraft had been prepared for pushback and had remote control Power Push Units (PPU) positioned on the respective aircraft main landing gear. VH-VQB was in the final stages of preparation for departure with all ground service equipment clear of the aircraft, all passengers on-board and seated and door L1 open, with the cabin service manager completing documentation and two customer service officers located on the aerobridge.

VQE was ready for departure ahead of schedule and the flight crew received a pushback clearance. They then advised the ground crew that the aircraft was 'clear to push'. A pushback was commenced, however the PPU did not respond to the ground crew's command on the hand-held remote control unit to commence reversing. The ground crewmember, initially believing the remote control unit battery was discharged, replaced the battery and attempted a second pushback without success.

At the time the command to pushback was sent to the PPU at gate 53, VQB began to move rearwards at gate 49. The flight crew, sensing the unexpected movement, immediately applied the aircraft's brakes, however the aircraft had moved over a metre rearward. As the aircraft moved, the two cabin service officers in the aerobridge became unsteady on their feet and a flight attendant in the aircraft galley received a minor scratch on one arm.

The ground handling crew had inadvertently obtained the incorrect remote control units for their respective PPUs prior to the commencement of the pushback. ■

Failure of horizontal stabiliser actuator

Occurrence 200301304

On 13 March 2003, while on final approach during a training flight, the crew of a Lear 45 aircraft, registered VH-SQR, reported feeling a severe vibration through their respective control columns, followed by a rapid 10 to 15 degree nose-down pitch change. Attempts to manually trim the nose of the aircraft up failed, with both crew members required to pull back on the control columns in order to regain control of the aircraft.

A subsequent inspection by the operator's engineers revealed that the aircraft's horizontal stabiliser could be moved by hand, vertically, approximately four inches at the leading edge. On examination, the horizontal stabiliser actuator appeared normal, with all attachments in place. However, the actuator was found to have free movement of its shaft in and out of the actuator body. Further detailed examination indicated that the actuator's primary 'Acme screw' had failed. With this screw failed, the horizontal stabiliser load should have been retained through a secondary rod, however, the threaded retaining nut had unscrewed from the rod.

The US National Transportation Safety Board (NTSB) advised the ATSB that they were conducting an investigation into the failure of the horizontal stabiliser actuator, and the ATSB appointed an Accredited Representative to that investigation.

As a result of the incident, the US Federal Aviation Administration (FAA) issued emergency Airworthiness Directive (AD) 2003-06-51, on 20 March 2003, requiring operators to conduct an immediate inspection of Lear 45 aircraft horizontal stabiliser actuators and to remove from service any actuators that were the same part number as the failed one.

The Australian Civil Aviation Safety Authority issued AD 5/2003, on 21 March 2003, requiring all Australian Lear 45 operators to comply with the requirements of the FAA AD. Additionally, the actuator manufacturer completed a new actuator design and has since had the new actuator certified for fitment to all affected Lear 45 aircraft.

The US NTSB is yet to publish its final investigation report (number ENG03WA011). ■

Collision with ground

Occurrence 200501000

At about 1326 Eastern Summer Time on 7 March 2005, the pilot of a Cessna Aircraft Company 310R, registered VH-FIN, commenced the takeoff from runway 30 right at Tamworth on a flight to Scone, NSW. Shortly after takeoff the pilot broadcast to air traffic control that he was experiencing 'control difficulties'. Witnesses reported that the pilot continued a left turn towards a downwind position, where the aircraft was observed to descend in a steep nose-down attitude. The aircraft impacted the ground in a cleared paddock about 4 NM west-south-west of Tamworth airport, fatally injuring the pilot who was the sole occupant of the aircraft. The aircraft was destroyed by the impact forces and post-impact fire.



Photo similar to accident aircraft
Photo Copyright © Rafael Henrique Carelli

The wreckage trail extended over a distance of about 232 metres. Ground impact marks and other physical evidence indicated that the aircraft struck the ground in a slightly right wing low, 35 to 50 degrees nose down attitude and that both engines were developing significant power at the time of impact.

During the on-site examination of the wreckage, investigators located a tool that would normally not be expected to be carried on the aircraft. Whether that tool contributed to the accident in any way will be examined as part of the ongoing investigation, which will also include the examination of:

- a number of aircraft items and components that were recovered from the accident site
- the aircraft's maintenance history
- the aircraft systems and their potential impact on the development of the accident. ■

Failure of primary inverter

Occurrence 200403857

At 1151 EST, on 11 October 2004, while in cruise at FL230, the pilots of a DHC-8-315 aircraft, registered VH-SBV, operating a scheduled flight from Horn Island to Cairns, Queensland, noticed the presence of smoke in the flight deck, which was followed by a loud bang emanating from a panel behind the pilot in command's (PIC) seat.

At the same time, a number of warning lights illuminated, including the primary and auxiliary inverter annunciations. The PIC's electronic horizontal situation indicator, attitude director, altimeter and vertical speed indicator instruments lost electrical power, so control of the aircraft was handed over to the copilot.

Because of the presence of smoke, the pilots donned their oxygen masks, commenced an emergency descent and conducted 'Oxygen' and 'Fire and Smoke' drills. By the time those drills had been completed, the smoke had dissipated enough to allow the removal of the oxygen masks, and the aircraft was levelled at 10,000 feet.

Inspection of the panel behind the PIC's seat identified a problem with the primary inverter. After completing the appropriate emergency procedures listed in the Quick Reference Handbook, the primary inverter was isolated and the auxiliary inverter selected, however, the PIC's instruments did not resume operation.

As the smoke had dissipated rapidly from the flight deck and the primary inverter had been isolated, the crew elected to continue to Cairns where a normal approach and landing was carried out.

A subsequent examination by the operator's ground engineers confirmed that the primary inverter had failed creating a power spike that resulted in a number of circuit breakers (CB) tripping. The tripping of the auxiliary inverter CB prevented the restoration of electrical power to the PIC's instruments.

After resetting the auxiliary inverter CB and functionally testing the system, the aircraft was flown to Brisbane, under the provisions of the minimum equipment list, where the primary inverter was replaced and the aircraft was returned to service. ■