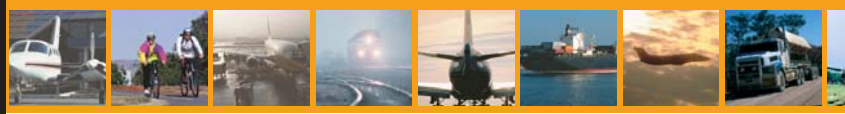
Australian Government
Australian Transport Safety Bureau

The Australian



Executive Director's Message

ATSB support to Indonesia for major accident investigation

You have no doubt noted the release of the final ATSB report on the Lockhart River accident and I commend it to your attention – there are many safety lessons.

Here, I overview ATSB's assistance to the Indonesian National Transportation Safety Committee (NTSC), especially with its investigation of the accident involving a Garuda Boeing 737-400 in Yogyakarta on 7 March 2007, in which one cabin crew member and 20 passengers died, including 5 Australians; with 2 Australians seriously injured, 2 receiving minor injuries and one uninjured.

An ATSB on-site team of three investigators worked in Yogyakarta and Jakarta between 8 and 18 March. A further four investigators and support staff worked on the aircraft's flight recorders in Canberra. Initial data from the flight data recorder was forwarded to the NTSC on 11 March, followed by a computer animation of FDR data on 16 March. Impact-related problems with the aircraft's cockpit voice recorder meant data could not be downloaded by the ATSB in Canberra so an ATSB investigator took the CVR data module to the manufacturer (Honeywell) in Seattle where the points in the memory module were reset and data successfully downloaded. Three Indonesian investigators transcribed the CVR data at the ATSB in Canberra between 22 and 24 March. The ATSB also helped the NTSC draft a preliminary report.

The NTSC has released this report to ICAO, the ATSB, and the NTSB under Annex 13. On 5 April, the NTSC authorised the ATSB to release the report to the Australian families of the accident victims and on 11 April, the NTSC publicly released a summary of the report, including recommendations, in the form of a media release.

The ATSB has a very good working relationship with the NTSC and has assisted them in the last couple of years with training and with CVR/FDR downloads and analysis. In addition to the Garuda accident, we have agreed to provide an accredited representative to assist with the 1 January 2007 Adam Air accident investigation. As resources permit, we will continue to respond to NTSC requests for assistance in the interests of future safety in our region.

Kym Bills, Executive Director

Final ATSB investi
Lockhart River 15-

On 4 April the ATSB's Executive Director released the Bureau's final 532 page report into the 15-fatality accident on 7 May 2005 involving a Fairchild SA227-DC Metro 23, registered VH-TFU, operated by Transair on an instrument flight rules regular public transport service from Bamaga to Cairns, with an intermediate stop at Lockhart River. There had been 3 factual reports, a research report and ten recommendations released in the interim. The final report included the results of detailed equipment, wreckage and recorder review and over 100 interviews and 25,000 pages of documentary analysis by a committed team of around a dozen investigators over nearly two years.

At 1143:39, the aircraft impacted terrain in the Iron Range National Park on the north-western slope of South Pap, a heavily timbered ridge, approximately 11 km northwest of the Lockhart River Aerodrome. It was destroyed by the impact forces and an intense, fuel-fed, post-impact fire and was not survivable. Weather conditions in the Lockhart River area were poor and necessitated the conduct of an instrument approach procedure for an intended landing at the aerodrome. The cloud base was probably between 500 ft and 1,000 ft above mean sea level and the terrain to the west of the aerodrome, beneath the runway 12 RNAV (GNSS) approach, was probably obscured by cloud.

As the copilot was making the radio broadcasts during the approach, it is very likely that the 40-year old pilot in command (PIC) was the handling pilot. The crew commenced the Lockhart River Runway 12 RNAV (GNSS) approach, even though the crew were aware that the 21 year old copilot did not have the appropriate endorsement and had limited experience to conduct this type of instrument approach. A non-directional beacon approach was also available at Lockhart River, and both pilots were endorsed for that approach. Despite the weather and copilot inexperience, the PIC used descent and approach speeds and a rate of descent greater than specified for the aircraft in the Transair Operations Manual, and exceeding those appropriate for establishing a stabilised approach.

During the approach, instead of a final approach speed of 117-130 kts, the aircraft was averaging about 175 kts. Instead of descending at no more than 1000 feet per minute, the aircraft was descending at about 1700 feet per minute. This did not meet the recommended criteria for a stabilised approach. The aircraft was also about 800 feet below the segment minimum safe altitude. The pilot in command had a history of fast flying, including without properly endorsed crew, and had been surprised by high terrain using this same approach ten days before when flying with a different copilot.

The ATSB assessed 19 'contributing safety factors' for which it had sufficient evidence to conclude that without the factor, the accident would probably not have occurred, or another contributing factor would

gation report on -fatality accident

probably not have occurred or existed. Ten of these involved the crew and most directly led to the accident. While the investigation was complicated by an inoperative cockpit voice recorder, no witnesses, and the extent of destruction of the aircraft, it determined that the crew probably experienced a very high workload during the approach and probably lost situational awareness about the aircraft's position along the approach path.

In addition to the substantive crew actions and local conditions that contributed to the accident, the investigation identified 7 contributing safety factors relating to Transair. Transair's processes for supervising the standard of flight operations at the Cairns base had significant limitations, such as not using an independent approved check pilot to review operations, reliance on passive measures to detect problems, and no defined processes for selecting and monitoring the performance of the base manager. In addition, Transair's standard operating procedures for conducting instrument approaches had significant limitations, such as not providing clear guidance on approach speeds, not providing guidance for when to select aircraft configuration changes during an approach, no clear criteria for a stabilised approach, and no standardised phraseology for challenging safety-critical decisions and actions by other crew members. Transair's organisational structure, and the limited responsibilities given to non-management personnel, resulted in high work demands on the Transair chief pilot. This resulted in a lack of independent evaluation of training and checking, and created disincentives and restricted opportunities within Transair to report safety concerns with management decision making.

The investigation also identified two contributing safety factors that related to the regulatory oversight of Transair. The ATSB concluded that CASA did not provide sufficient guidance to its inspectors to enable them to effectively and consistently evaluate several key aspects of operator's management systems. These aspects included evaluating organisational structure and staff resources, evaluating the suitability of key personnel, evaluating organisational change, and evaluating risk management processes. CASA also did not require operators to conduct structured and/or comprehensive risk assessments, or conduct such assessments itself, when evaluating applications for the initial issue or subsequent variation of an Air Operator's Certificate.

The investigation also identified 21 other safety factors which did not meet the definition of a contributing safety factor or which could not be as clearly linked to the accident because of lack of evidence, but which were still considered to be important to communicate in an investigation report with a focus on future safety. In addition to some aspects of Transair's processes and regulatory oversight activities, these safety factors related, among other things, to the possibility of poor intra-cockpit communication, instrument approach design, instrument approach chart presentation, and other regulatory requirements.

This investigation identified important learning opportunities for pilots, operators and regulatory agencies to improve future aviation safety and to seek to ensure such an accident never happens again. During the course of the investigation, the ATSB issued 10 safety recommendations and encouraged other safety action. Safety action has been taken by several organisations to address the safety issues identified during this investigation. A number of additional safety recommendations were issued by the ATSB, including seven recommendations to CASA on its regulatory oversight activities and regulatory requirements. Recommendations on aspects of instrument approach charts were also issued to Airservices and Jeppesen. The ATSB did not issue recommendations regarding the serious safety issues of the operator because Transair had surrendered its Air Operator's Certificate on 4 December 2006 and ceased to operate. ■

Safety briefs

Cracked window

Occurrence 200506298

On 2 December 2005, a Boeing Company B737-7Q8 aircraft, registered VH-VBC, was being operated on a scheduled passenger flight from Townsville to Brisbane Qld. While the aircraft was passing flight level 370 on climb, the crew heard a 'bang', which was closely followed by the annunciation of a Window Overheat master caution. After becoming aware that the outer layer of the pilot in command's L1 window was cracked, the crew followed the checklist for window damage. As a result, at about 2106 Eastern Standard Time, a cabin altitude warning horn sounded. The sounding of the warning horn was the normal result of the crew's implementation of the checklist for window damage. However, the flight crew believed that the aircraft was depressurising as a result of the window damage and responded to the cabin altitude warning by carrying out an emergency descent from 33,000 ft to 10,000 ft.

During the descent, the crew closed the valve that controlled the outflow of air from the aircraft. The flight crew soon realised that the aircraft was not depressurising, but pressurising, and opened the outflow valve. The combined action of the crew and the automatic opening of the safety relief valves reduced the cabin pressure at a rate greater than that which passengers normally experience. As a result, 11 passengers sustained minor injuries.

Following a company investigation, the operator retrained the flight crew involved in the incident, audited its check and training system and modified the simulator programme to include operational issues identified in this incident.

The aircraft manufacturer has modified the checklist for window damage to minimise the possibility of a cabin altitude warning occurring when the checklist is used.

The operator, in conjunction with the manufacturer, is still investigating the cause of the window breakages. ■

Breakdown of separation

Occurrence 200504338

On 31 August 2005, the crew of a Fairchild Industries Inc SA227–DC (Metro) aircraft had been issued a clearance for a visual approach to runway 14 at Brisbane Airport. At about the same time, the crew of a Boeing Company 717–200 (717) aircraft had been issued a take-off clearance from runway 01. The crew of the Metro commenced a go-around from runway 14 at about the same time the 717 became airborne from runway 01. The 717 crossed about 625 m in front of, and 580 ft above, the Metro. There was a breakdown of separation.

The Metro's descent to Brisbane had been restricted by another aircraft, which placed it above the normal descent profile. The aerodrome controller misjudged the position of the Metro, which resulted in the incorrect application of separation standards and inadequate consideration to the likelihood that the crew of the Metro would undertake a go-around.

After the Metro crew commenced the go-around, the controller was unable to visually separate the aircraft. The controller had not provided traffic information to the crew of either aircraft, nor was he required to do so. The controller attempted to make the Metro crew aware of the 717, but did not provide the information in the form of a safety alert as required by the Manual of Air Traffic Services.

Without prior knowledge of the 717, the crew of the Metro found it difficult to identify the correct aircraft, as the 717 was initially below their level and masked by background lighting.

As a result of previous occurrences, the ATSB had issued a safety recommendation to Airservices Australia in October 2006 in relation to the provision of relevant traffic information, to enhance pilot situational awareness. ■

Smoke event

Occurrence 200606215

On 19 October 2006, at about 0635 Eastern Standard Time the crew of a de Havilland Canada DHC 8-200 aircraft, registered VH-TQX, departed from Melbourne Airport, Vic on a scheduled flight to Wollongong NSW. At about 0645, as the aircraft was climbing through flight level 140, the pilot in command (PIC) detected smoke in the aircraft. Soon afterwards a smoke detector warning sounded in the aircraft toilet and the flight and cabin crew observed smoke haze. The flight crew reported the situation to air traffic control (ATC) then diverted the aircraft to Melbourne and carried out the appropriate recall and checklist actions. The aircraft landed in Melbourne on runway 16 at 0658. There were no reported passenger or crew injuries.

The manufacturer's examination of the engine showed that oil had leaked from several compressor bearings into the low pressure compressor of the engine. The high temperature of the compressed air and the engine components caused the oil to vaporize, contaminating the air extracted from that engine section to the aircraft cabin. The manufacturer had previously issued three service bulletins recommending engine modifications pertinent to this occurrence. Compliance with the bulletins was optional. However, the operator had already modified about 90% of the affected engines in its fleet at the time of the incident. The operator has planned to modify the remaining engines at the next period of scheduled or unscheduled maintenance.

The crew's timely assessment and response to the in-flight emergency reduced the likelihood of an extended exposure to the fumes by the passengers and crew. Also, the initiation of an emergency phase by air traffic control ensured that appropriate services were available to assist the crew after the aircraft had landed.

The engine manufacturer has undertaken to update the Workscope Planning Guide for the PW 123D engine to improve its resistance to internal oil leakage. ■

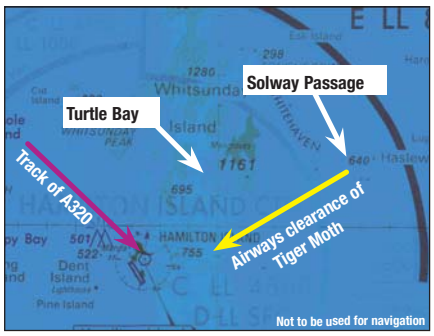
Air–ground communications

Occurrence 200604360

On 29 July 2006 at approximately 0917 Eastern Standard Time, an Airbus, A320-232 (A320) aircraft, operating under the instrument flight rules (IFR), was on a scheduled passenger service from Sydney, NSW, to Hamilton Island, Qld. The crew was conducting a runway 14 very high frequency omni-directional radio range (VOR) instrument approach to land at Hamilton Island Airport. At that time, a de Havilland Aircraft Pty Ltd DH-82A Tiger Moth (Tiger Moth) aircraft, operating under the visual flight rules (VFR), was seen to be near the A320's approach path to the north-west of Hamilton Island. The pilot of the Tiger Moth had not complied with a previous instruction to remain east of the eastern tip of Hamilton Island, which was well to the east of the instrument approach path.

The Hamilton Island aerodrome controller (ADC) issued clearances and instructions to the pilot of the Tiger Moth and to the pilot of the A320 to facilitate traffic management in accordance with published procedures. He was not required to apply a separation standard between an aircraft operating under the IFR and another aircraft operating under the VFR in class D airspace. He was required to provide traffic information to the pilots of both aircraft in class D airspace.

Extract from the Whitsunday Visual Terminal Chart (VTC) depicting the location of Turtle Bay, Solway Passage and the approximate tracks of the A320 and the Tiger Moth



However, the aerodrome controller did not provide traffic information to the pilots of either aircraft in accordance with class D procedures. The pilot of the Tiger Moth did not comply with the air traffic control instructions. The provision of traffic information may have assisted the pilot of the Tiger Moth with situational awareness and helped to ensure that he did not proceed towards the A320 as it approached Hamilton Island. ■

Ageing aircraft and flight safety

Aviation Safety Research Report

This report examined the relationship between ageing aircraft and flight safety, to determine the chronological age of the Australian aircraft fleet, and to review current and future directions for the management of ageing aircraft.

Age can be managed by retiring the aircraft and purchasing a newer aircraft or through adequately maintaining ageing aircraft through additional and specific maintenance. This requires cooperation between regulators, manufactures, maintainers, operators, and owners. Continuing airworthiness programmes and Supplementary Inspection Programmes are methods of ensuring adequate maintenance. Ageing of an aircraft can be a safety issue, but adequate maintenance can mitigate the consequences of ageing. Current and future maintenance programmes help to reduce the safety risk associated with ageing aircraft, but only if the operators adhere to the programmes.

In Australia, the average age of fleet of turbofan aircraft is low, and has been decreasing. Multi-engine turbofan aircraft with a maximum take-off weight between 50,001 and 100,000 kg had the lowest average age in 2005 at just 6 years. This was the only aircraft category whose average age decreased over the period 1995 to 2005. The turbofan aircraft with a maximum take-off weight of more than 100,000 kg had an average age of 11 years in 2005. The high-capacity turbofan aircraft receive extensive continuing airworthiness support from the manufacturers. The low age and extensive continuing airworthiness support provide a double defence to ensure the safety of the Australian multi-engine turbofan aircraft fleet.

The piston engine fixed-wing aircraft fleet, by contrast, had the highest average age at 30 years. These aircraft often do not receive the same level of continuing airworthiness support from the manufacturer as the turbofan aircraft. In Australia, multi-engine piston aircraft are often used in regular public transport and charter operations, and therefore the high average age needs to be considered in relation to their safe operation in passenger services. ■

Engine power loss

Occurrence 200601688

On 5 April 2006, the pilot of an amateur-built Lancair 360 aircraft, registered VH-ZNZ, was conducting circuits at Bankstown Airport, NSW. It was the aircraft's first flight since being repaired after a landing accident in 2003.

Following an overflight and a touch-and-go, the pilot conducted another touch-and-go and shortly after lift-off, at an altitude estimated by witnesses to be between 100 ft and 400 ft, the engine was heard to malfunction. Almost immediately, while still not above 500 ft, the aircraft rolled into a steep right turn. Engine power was heard to return, but sounded intermittent. After turning approximately 90 degrees, the aircraft rolled out of the turn momentarily to about wings level, before the turn steepened again to the right. The aircraft was observed to roll further to the right and descend steeply. The aircraft impacted a taxiway, the pilot was fatally injured and the aircraft destroyed.

The investigation found that the engine power loss was probably due to interruptions of fuel flow to the engine, but could not conclusively determine the reason. The aircraft stalled at a height insufficient to allow the pilot to recover.

The investigation identified a number of safety issues related to stall warning, management of incomplete engine power loss after takeoff, pilot transition training and the provision of information to purchasers of amateur-built aircraft.

Following the occurrence, the Civil Aviation Safety Authority and Sport Aircraft Association of Australia implemented a number of safety actions. As a result of this and other occurrences the Australian Transport Safety Bureau initiated a broader investigation into loss of control following engine power loss after takeoff. ■