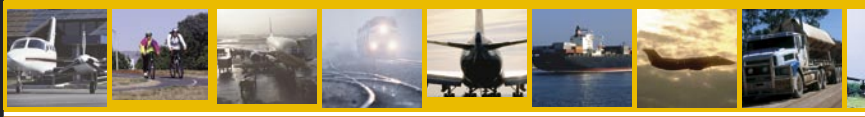
Australian Government
Australian Transport Safety Bureau

# The Australian Air



The ATSB makes a significant contribution to the safety of the Australian aviation industry and travelling public through investigation, analysis and open reporting of civil aviation accidents, incidents and safety deficiencies.

It performs air safety functions in accordance with the provisions of Annex 13 to the Convention on International Civil Aviation (Chicago Convention 1944) as incorporated in the Transport Safety Investigation Act 2003. The Act contains the ATSB's authority to investigate air safety occurrences and safety deficiencies.

Investigations commenced on or before 30 June 2003, are conducted in accordance with Part 2A of the Air Navigation Act 1920.

Investigations commenced on or after 1 July 2003, are conducted in accordance with the Transport Safety Investigation Act 2003 (TSI Act).

The ATSB is an operationally independent bureau within the Federal Department of Transport and Regional Services. ATSB investigations are independent of bodies, including regulators that may need to be investigated in determining causal factors leading to an accident or incident. ATSB is a multi-modal bureau with safety responsibilities in road, rail and sea transport in addition to aviation.

The Australian Air Safety Investigator is a regular four-page feature in Flight Safety Australia produced with editorial indepen-dence by the ATSB. It aims to keep the industry informed of the latest findings and issues in air safety from the bureau's perspective.

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

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

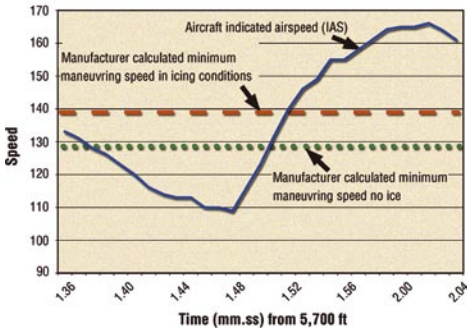
**An Aviation Self Reporting Scheme (ASRS) form can be obtained from the ATSB website or by telephoning 1800 020 505.**

## Near crash from icing prompts call for better stall warning

The twin-turboprop cleared the ground by about 112 feet as the pilots recovered from the stall. They then climbed to a safe altitude and a few moments later completed an uneventful landing.

The incident underscores the continuing hazard of in-flight icing, the need for aircrews to be extremely conscious of the danger posed by exposure to icing conditions, and the need for greater progress in the industry overall to improve training and equipment for coping with in-flight icing.

**Recorded Aircraft Speed & Target Speeds**




As captured by the flight data recorder, the airspeed prior to stall was significantly below the minimums recommended for both icing and non-icing conditions. Source: ATSB

As the saying goes, a turboprop aircraft flying in heavy icing conditions can become an icicle enroute to becoming a hailstone.

The incident involved an icing-induced stall – actually two stalls in rapid succession – of a July 28, 2002, Hazelton Airlines flight from Sydney to Bathurst, Australia. The early night flight of the Saab 340 with two pilots and 30 passengers came within a hairsbreadth of ending in disaster. Indeed, the case might not ever have come to light had not a passenger, advised of the seriousness of the situation by the passenger and experienced pilot sitting next to him, later submitted a confidential report of the frightening event to the Australian Transport Safety Bureau (ATSB). This account galvanized the agency into action. The ATSB's report of investigation was issued Jan. 28. The event was classified as a serious incident, defined as one where an accident nearly occurred.

The pilot-in-command (PIC) of the flight reported a 'wing drop' on the approach into Bathurst to the chief pilot the next morning but attributed it to turbulence, not icing. The chief pilot asked for a written report, which the PIC submitted four days later. The matter would have gone no further without the passenger's letter to the authorities.

What emerges from the ATSB report is the need for improved preparedness for icing encounters. In-flight icing continues to catch aircrews by surprise, and basic design and warning systems may not be adequate to alert crews to impending danger. ■

This is an extract from Air Safety Week Vol. 18 No. 9 reprinted with permission of PBI Media.LLC.
A full report of the serious incident mentioned in this article is available on the ATSB website **www.atsb.gov.au** or from the Bureau on request.

# Aviation Self Reporting Scheme

Following an amendment to the *Civil Aviation Act 1988* and associated regulations, a new voluntary and confidential reporting scheme introduced by the Government, entitled the Aviation Self Reporting Scheme (ASRS) began operation on 21 February 2004. Within the ATSB the ASRS has replaced the Confidential Aviation Incident Reporting (CAIR) system. With the introduction of the ASRS, it was decided to end the CAIR scheme in the context of an excellent level of mandatory reporting to the ATSB and the establishment of confidential reporting schemes by operators as part of their safety management systems. CAIR reports are no longer accepted by the ATSB and the online CAIR reporting form has been removed from the ATSB website.

The enabling legislation for the ASRS is the *Civil Aviation Amendment Act 2003*. The *Civil Aviation Safety Amendment Regulations 2004* provide the structure for the voluntary reporting aspect of the scheme. The regulations nominate the Executive Director of the ATSB and delegates as the administrators of the ASRS for voluntary reporting. Details of the *Civil Aviation Amendment Act 2003* and the Civil Aviation Safety Amendment Regulations 2004 are available on the ATSB website **www.atsb.gov.au**

Under the ASRS, subject to the exceptions detailed below, the holder of a civil aviation authorisation may report a contravention of the *Civil Aviation Regulations 1988* (CAR) and the *Civil Aviation Safety Regulations 1998* (CASR) committed by the holder. The regulations do not permit the ATSB to disclose the identity of a reporter who has submitted an 'eligible' report under the ASRS, unless the reporter consents to the disclosure. Third party reporting is not permitted under the ASRS. Confidential third party reports can be submitted to CASA on the Hotline 1800 074737 or to the confidential reporting systems maintained by operators.

To be eligible under the ASRS, a report must be in writing and be about the reporter's own contravention of a CAR or CASR, and must be submitted no later than 10 days after the contravention and before CASA issues an infringement or 'show cause' notice. A reporting form is available on the ATSB website. It is currently available in a PDF format that can be printed off, completed and submitted in hard copy. In the near future, the reporting form will become available in a secure online reporting format.

Upon receipt of a report, the Manager ASRS will check it for eligibility. Once declared eligible, the report in de-identified form, will be entered into the ASRS database, which will allocate a unique number. The Manager will then supply the reporter with a receipt quoting the unique number and a brief summary of the details of the contravention. The reporter's original report will be returned with the receipt. All that will be retained by the ATSB is the de-identified report in the database. A de-identified report of the contravention may be supplied to CASA or to other offices within the ATSB if the contravention is assessed as having wider implications for safety. More specifically, the de-identified reports may be used to:

- strengthen the foundation of aviation human factors research;
- identify deficiencies and problems in the Australian aviation safety system; and
- provide data for planning and improvement to the Australian aviation safety system.

Should CASA take administrative action, the holder can then produce the receipt issued by the ASRS which gives him/her protection from CASA action. Protection from administrative action covers protection from CASA using the reported contravention to vary, suspend or cancel a civil aviation authorisation. If an infringement notice is issued, the reporter is not required to pay the penalty in the infringement notice and the notice is taken to be withdrawn.

The authorisation holder can receive protection once every five years.

Contraventions of the regulations that are not reportable under the ASRS are:

- a contravention of the regulations that is deliberate or fraudulent;
- a contravention of the regulations that causes or contributes to an accident or to a serious incident (whether before or after the contravention is reported); and
- a contravention of any *Civil Aviation Regulations 1988* 282, subregulation 288(2), 298A, 298B, 298C, 301, 302 and subregulation 305(1A); this information is printed on the reverse side of the ASRS reporting form.

It should also be noted that a report submitted under the ASRS does not satisfy the reporting obligations under the *Transport Safety Investigation Act 2003* for Immediately Reportable Matters or Routine Reportable Matters. Accidents and incidents must be reported to the Executive Director of Transport Safety Investigation under the ATSB's mandatory reporting scheme.

For general inquiries, contact the Manager ASRS on 1800 020 505 or email **asrs@atsb.gov.au**

For specific inquiries relating to obtaining protection from administrative action at CASA, contact the Manager of Enforcement and Investigations at CASA on 131 757. ■

# Safety briefs

## Fumes in the cabin and on flight deck

Occurrence 200205865

The British Aerospace 146-100A was being prepared for a regular public transport service. As the copilot boarded the aircraft to conduct pre-flight checks he detected strong fumes in the cabin and the flight deck and noted that the auxiliary power unit (APU) was supplying bleed air to one of the aircraft's two airconditioning packs.

Maintenance engineers were requested to investigate the source of the fumes and subsequently discovered an oil leak in the APU generator drive adaptor pad. The APU was isolated from the airconditioning system in accordance with the terms of the aircraft's Minimum Equipment List. The engineers operated both packs using engine air until they were satisfied that there were no fumes. The aircraft was then released for service.

The copilot and the two cabin crew were affected by the strong fumes, became unwell, and were removed from flight duty. In accordance with company standard practise they underwent medical examinations. The pilot in command was exposed to the fumes for a short time only and was not affected.

The pilot in command and a replacement crew subsequently operated the scheduled service. The cabin crew reported a slight smell of fumes toward the rear of the aircraft during the first sector. On the return sector, both cabin crew reported feeling unwell, with symptoms consistent with fumes inhalation.

Subsequent inspection revealed oil wetness in the number-3 engine high-pressure compressor, the result of a worn number-1 bearing seal. ■

## Collision with ground

Occurrence 200206005

The Lancair, registered VH-CIV, was undergoing a flight test program following construction by the owner. During an earlier test flight, the aircraft had entered a stall, and rolled 45 degrees right and left during the recovery. On the accident flight the aircraft was planned to enter a stall. During the flight, the aircraft entered a stall at a height of approximately 6,000 ft. The aircraft rolled at the initiation of the stall and continued to roll as it descended rapidly at an angle of approximately 40 degrees to the horizontal. The aircraft accelerated to approximately 150 knots, with low engine power. Power was increased shortly before impacting the ground with wings level at a pitch angle of 40 degrees nose down. The 2 occupants were fatally injured.

The test pilot and the owner/builder were on board the aircraft at the time of the accident. The aircraft was built under the experimental designation, and was based on a Lancair IV-T kit plane. The design had been modified during construction. There was no evidence of any risk assessment process associated with design changes to assess the safety implication of the changes. There was no risk assessment process for the planning and conduct of the flight test program. Such an assessment could have enabled the safety implications of any hazards to be considered prior to subsequent tests.

The aircraft was equipped with an electronic flight instrumentation system. The aircraft's flight path was retrieved from data stored in the system. ■

## Smoke on the flight deck

Occurrence 200203030

The British Aerospace BAe 146 was being operated on a regular public transport service when, approximately 5 minutes after take-off, the flight crew detected smoke on the flight deck. They donned their oxygen masks in accordance with the emergency checklists that dealt with smoke, fumes or fire and made a PAN transmission to air traffic control, requesting a return to the departure airport. During the descent, the pilot in command briefed the cabin crew, alerting them to the possibility of a cabin evacuation.

Initially believing that the electrical system was the source of the smoke, the crew commenced the emergency checklist for Electrical Smoke, Fumes or Fire of Unknown Origin. As the aircraft was close to the departure aerodrome and the crew's priority was to land as soon as possible, that checklist was not completed.

The rescue and fire fighting services (RFFS) attended as the aircraft landed, without further incident, 20 minutes after take-off. The crew stopped the aircraft on the taxiway and RFFS personnel inspected the electronics bay in an attempt to trace the source of the smoke. Nothing abnormal was observed.

Maintenance personnel inspected the aircraft and established that the smoke and fumes in the cockpit were due to contaminated bleed air from the number-1 engine. The defective engine was removed from the aircraft several days later and was returned to the engine manufacturer for overhaul. The overhaul procedure revealed that the engine's number-2 forward and aft carbon seals had heavy carbon build-up and were leaking oil. The manufacturer's report stated that the engine's number-4 carbon seal also showed evidence of oil leakage. ■

## Faulty emergency pressurisation valve

Occurrence 200205216

Shortly after take off from Gawler SA, the crew of the Cessna 441 Conquest heard a loud air noise. The pilot in command recognised this as the emergency pressurisation system operating. The pressurisation selector switch was checked and found to be in the BOTH position. Selection was made between LEFT and RIGHT, however the air noise continued and there was no activation of the emergency pressurisation warning light. At this point the crew elected not to proceed to Essendon but to divert to Adelaide, where engineering staff were available.

Subsequently, a passenger noticed that the air by his feet was getting hot and advised the crew. Light grey smoke was noticed by the co-pilot in the mid cabin area. The crew conducted the emergency checklist for smoke removal and donned their oxygen masks as a precaution. The storm window was opened to assist with removal of smoke from the aircraft as it was stinging the co-pilot's eyes.

The pilot declared a PAN and, at this point, the aircraft was 2 km abeam Parafield. The crew elected to divert to Parafield, the nearest airfield where emergency services were available. An uneventful landing was carried out and no injuries were reported.

An engineering examination of the aircraft found that the activation of the emergency pressurisation system was initiated by a faulty emergency pressurisation valve. It was also found that, in the process of fitting new side wall trim carpet to the aircraft, the edge of the carpet had not been trimmed around the rear conditioned air duct. This duct supplies air for the emergency pressurisation system and the faulty emergency pressurisation valve allowed hot air to flow unmetered into the cabin. The carpet covering the duct had been exposed to excessive heat, which led to the fumes and smoke in the cabin.

The faulty emergency pressurisation valve was replaced, the carpet trimmed and the aircraft was returned to service. ■

## Failure of number 3 engine

Occurrence 200200646

Approximately one hour after departing Sydney on a regular passenger transport flight to Bangkok, Thailand, the Boeing 747-436 aircraft, registration G-BNLD, sustained the failure of the right inboard (number-three) engine, necessitating a return to Sydney airport where an uneventful one-engine inoperative landing

was made.

Failure of the number-three engine resulted from the fracture and liberation of a single first-stage low-pressure compressor (fan) blade. The blade failed through the lower aerofoil section, immediately adjacent to the dovetail connection with the rotor disk. While the initial blade impact was fully contained by the fan casing, many fragments of the fractured blade and its damaged neighbours punctured the intake cowling or escaped forward of the nacelle, producing damage to the wing, control surfaces and the fuselage. Imbalance forces generated by the blade loss produced extensive damage to the engine accessory components and disrupted the primary load-bearing path between the engine fan case and the thrust reverser assembly.

Laboratory examination of the retained root section of the failed blade established that fatigue cracking had initiated and propagated from a pre-existing defect at the blade centreline. The defect was characterised as a 'lack of bond' feature at the interface between the two sandwiched titanium alloy panels used to form the blade. Fatigue cracking had initiated from the upper edge of the defect and propagated under operationally induced bending and centrifugal loads.

The lack of bond defect had formed during manufacture of the blade in 1991. ■

## Landing gear malfunction

Occurrence 200301185

The pilot of a Cessna 310R made a night departure from Gove, NT, at 1900 CST for Groote Eylandt, NT. After takeoff the pilot noticed two unusual thumps near the end of the landing gear retraction cycle. Normal landing gear up indications were observed and there were no unusual handling characteristics during the flight to Groote Eylandt.

The pilot reported that on arrival in the circuit area he selected the landing gear down. The landing gear operated, but the left main landing gear down light did not illuminate at the end of the cycle. A number of attempts, including use of the hand crank and aircraft manoeuvres, were made to extend the landing gear without success.

After consultation with a pilot on the ground and briefing the passengers, the pilot made an approach to runway 28 with the gear selected up and the flaps down. While on final approach the pilot released his emergency exit and unlatched the cabin door.

The aircraft made a smooth touchdown and slid on the runway. The passengers exited over the right wing and moved away from the aircraft. There was no fire but the propellers and underbelly of the aircraft were damaged.

Inspection of the aircraft by engineering personnel revealed that the rod end on the outer end of the left main gear inboard push-pull tube had separated, effectively disconnecting the left main gear assembly from the actuating mechanism. Laboratory examination by the ATSB revealed that rod end separation had occurred under predominantly tensile forces after fracturing through one side of the eye section due to fatigue.

The Civil Aviation Safety Authority has undertaken to assess the Australian fleet implications of the failure. They have also undertaken to develop advisory documentation or corrective actions as required, to address any safety of existing fleet issues that may be identified. ■