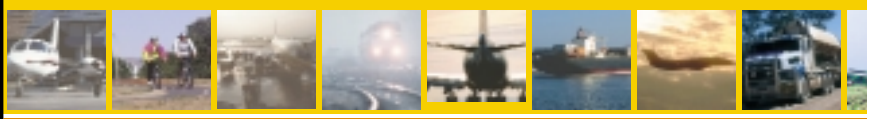
ATSB
Australian Transport Safety Bureau

The Australian Air Saf



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 Part 2A of the *Air Navigation Act 1920*. Part 2A contains the ATSB's authority to investigate air safety occurrences and safety deficiencies.

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 six-page feature in *Flight Safety Australia* produced with editorial independence by the ATSB. It aims to keep the industry informed of the latest findings and issues in air safety from the bureau's perspective.

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A Confidential Aviation Incident Reporting (CAIR) form can be obtained from the ATSB website or by telephoning 1800 020 505.

Engine flame-out — Shoulder harness failed on impact

Occurrence 200104604

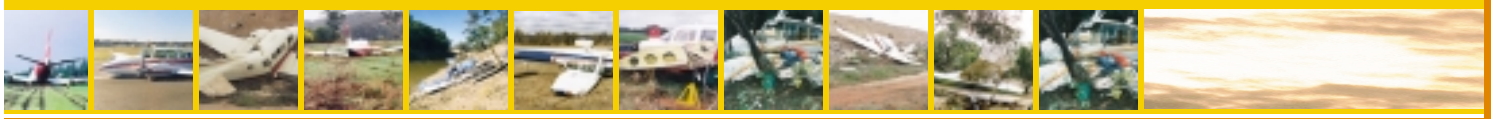
The Bell Jetranger 206B-(III) helicopter was engaged in aerial firefighting operations utilising an external water bucket and staging out of a nearby national park campground. The pilot reported that he started flying at approximately 0750 hours after completing a pre-flight check of the helicopter, which included draining the fuel sump, inspecting the fuel, and confirming 106 litres or 27.9 United States Gallons (USG) of total indicated fuel. At approximately 0825 hours, while engaged in water bucket operations, he discussed his fuel status with other company pilots on a common radio frequency and noted 38 litres (10 USG) of indicated fuel remaining. He finished a swath run of the fire area, dropping water and then decided to complete one more swath run before returning to refuel.

Approaching the fire line, the helicopter entered a left turn at approximately 200-ft above ground level (AGL). The pilot reported that the helicopter was buffeted by strong turbulence, which caused the helicopter to yaw left and go out of trim. He reported that the engine power then began surging and, subsequently, an engine flameout occurred. He continued the left turn, jettisoned the water and initiated a power-off autorotation to a heavily wooded area.

The pilot's left shoulder harness had broken and separated at a point just forward of and below the pilot's shoulder. The pilot's left shoulder harness was sent for testing by an independent belt and harness testing and repairs organisation. The webbing was identified as MIL-T-50368 Type IV, 2 inch Nylon Webbing, rated at 2,000 pounds strength. The rated assembly strength of the harness assembly was 1,500 pounds. Testing revealed that the webbing failed at a value of 391 pounds, or less than 20 per cent of the original strength of the material. Factors contributing to the loss of original strength were ageing related to ultraviolet light exposure, abrasion damage and contamination by turbine oil.

There was no requirement to confirm compliance to minimum performance standards of shoulder or seat belt harnesses while in service, or to specifically identify shoulder harnesses.

The investigation determined that fuel supply to the helicopter engine was interrupted, resulting in engine surging and subsequent flameout.



Recently completed investigations

As reports into aviation safety occurrences are finalised they are made publicly available through the ATSB website.

Published January–Febuary 2003

Occ. no.	Occ. date	Released	Location	Aircraft	Issues
200200377	16 Feb 02	27 Feb 03	2km SW Williamtown NSW	de havilland DH82A	Loss of control
200202442	28 Feb 02	26 Feb 03	Western Tiers, Tas.	Hughes 369E	Engine power loss
200202709	13 Jun 02	25 Feb 03	22km east of Canberra VOR	Dash 8 & B737	Loss of separation standards
200202385	25 May 02	29 Jan 03	Cairns Aerodrome, Qld	Cessna 172 & boeing 747	Loss of separation standards
200200094	31 Jan 02	23 Jan 03	111 NNE Pumas IFR	Boeing (3)	Loss of separation standards
200200047	17 Jan 02	22 Jan 03	93km SE Melb. Aerodrome, Vic	Beech Duchness	Inadequate pre-flight preparation
200200885	9 Mar 02	22 Jan 03	11km SE of Cairns, Qld	Cessna 340A	Fuel flow fluctuations
200202656	5 Jun 02	6 Jan 03	Lake Evella Aerodrome NT	Bell Helicopter Jetranger	Engine failure
200202896	24 Jun 02	20 Feb 03	13km SE Tamworth VOR, NSW	Aerostar & Airtrainer	Loss of separation standards

What is the Australian Transport Safety Bureau?

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal body that investigates, analyses and reports on transport safety. The ATSB is not part of the Civil Aviation Safety Authority (CASA). The ATSB is Australia's prime agency for the independent investigation of civil aviation accidents, incidents and safety deficiences. To report an Aviation, Marine or Rail accident telephone ATSB (toll-free, 24 hours): **1800 011 034.**

Safety briefs

Engine Failure

Occurrence 200202656

The pilot of the Bell 206 helicopter had been tasked with conducting a survey operation in the Dhoyndji area of the Northern Territory. The pilot departed Dhoyndji at approximately 1150 Central Standard Time (CST) and tracked towards the southwest to commence the survey work. After landing and completing ground survey work for approximately an hour, the helicopter was then flown in a northeasterly direction towards the Mitchell Ranges. The surrounding terrain, over which the helicopter was flying, was generally flat and lightly treed. The tree spacing was such that landing areas were not readily apparent.

At 1330 a refuelling party noted that the helicopter was overdue for a scheduled refuelling stop and its SARTIME had expired. AusSAR assumed responsibility for search coordination and the wreckage of the helicopter was found the following day. A sole survivor was rescued and four persons were fatally injured in the accident. The survivor reported that, as the pilot searched for a landing area in the Mitchell Ranges, he heard a single `beep' and shortly after heard continuous 'beeping' in his headphones.

A wreckage examination revealed that the helicopter appeared to have been in an autorotational descent when the advancing main rotor blade impacted a tree. The helicopter then impacted the ground on its left side, and shortly after an intense post impact fire consumed the wreckage, completely destroying the engine accessory gearbox.

The survivor later identified the beeping as that of the engine out audio warning tone. The investigation was unable to determine the cause of the engine failure due to the fire damage to the accessory gearbox.

Impact with floodlight

Occurrence 200201100

The pilot, the sole occupant of the Cessna 210 aircraft, was conducting a charter positioning flight from Groote Eylandt to Numbulwar.

Witnesses reported that shortly after the aircraft took off from runway 10, it diverged to the right of the runway and in level flight at about 20 ft above the ground tracked towards the operator's ticketing office. The aircraft subsequently struck a floodlight, a VHF aerial and two palm trees. It then hit the ground approximately 150 m beyond the aerial and was destroyed by fire and impact forces. Although the pilot was able to exit the aircraft unaided, he later died from injuries received during the accident. Post-mortem and toxicological examination did not identify any factor, which may have impaired the pilot's ability to operate the aircraft safely.

At the time of the accident, the automatic weather station at the airport recorded the wind as 9 kts, gusting to 15 kts, from 100 degrees magnetic. Witnesses reported that the weather was generally fine with scattered cloud.

The investigation was unable to establish why the aircraft diverged from the runway heading immediately after take-off.

Intermittent electrical connection

Occurrence 200105173

During initial climb, the right propeller of the DHC-8-315 (Dash 8) aircraft auto-feathered. The flight crew retarded the right engine power lever, declared a PAN (radio code indicating uncertainty or alert) condition, and completed an uneventful single engine return to Sydney airport.

The aircraft was fitted with two Pratt and Whitney Canada PW123E engines. The flight data recorder (FDR) indicated that the right engine over-torqued to 120 per cent for 7 seconds after the propeller feathered. The FDR also indicated that the left engine over-torqued to 117 per cent for 20 seconds. The engine manufacturer's transient over-torque limits were not exceeded.

Maintenance personnel found that a loose connection of the right engine torque signal conditioning unit (TSCU) connector pins resulted in an intermittent electrical connection. The TSCU was replaced as a precaution, and the connector was cleaned and reseated. Following a flight test, the aircraft was returned to service.

Propeller auto-feathering:

The propeller auto-feather system, when selected, was designed to automatically feather the propeller during take-off, if the engine torque decreased below about 22 per cent rated torque. Interlock features in the auto-feather logic and control circuits provided arming control and prevented auto-feather of the operating propeller, once the auto-feather sequence for one of the propellers was initiated. The system provided for relaying a 'power uptrim' (engine power increase) signal to the operating engine.

Loss of separation standards

Occurrence 200202896

The pilot of a Ted Smith 601B (Aerostar) had been issued with a clearance by the Tamworth aerodrome controller (ADC) to 'track east of the New England highway until intercepting final runway 30R' at Tamworth and, subsequently, to 'report established east of the highway'. The voice recording of the occurrence showed that the clearance issued by the ADC to the pilot of the Aerostar clearly stated the route to be flown by that pilot. The pilot correctly read-back the clearance and reported established east of the highway but did not remain east of the highway.

Tamworth Air Traffic Control (ATC) provided a non-radar, or procedural control, service to aircraft operating within the Tamworth control area and control zone. Controllers used non-radar information to establish and maintain procedural separation standards. The controller intended to establish a horizontal separation standard using a 1 NM buffer to the track or position of the Aerostar relative to the New England highway that runs approximately south from Tamworth township and which crossed the inbound track of the Aerostar approximately 12 NM south-east of the aerodrome.

The pilot of the Aerostar was operating under the instrument flight rules (IFR) and later reported that he would have preferred to track with reference to his instruments, via IFR tracking points. That pilot reported that his workload at the time of the occurrence was high due to the combined effects of the sun in his eyes, the visual tracking instructions issued by the ADC and because he was unfamiliar with the aerodrome.

The pilot of the Aerostar had a responsibility to advise the ADC that he was either uncertain about the clearance he had been issued, or that he was unable to proceed in accordance with the clearance issued. The ADC could then have issued an alternative clearance. Such timely notification is particularly important in a procedural environment where controllers rely on the integrity of the information provided by pilots to ensure the safe, orderly and expeditious flow of air traffic.

Inadequate pre-flight preparation

Occurrence 200105446

The pilot of the Cessna 210 declared a MAYDAY and stated that he had lost engine power and was attempting a landing on a road. A short time later, the aircraft impacted heavily in a left wing low, nose-down attitude on lightly wooded scrub ground to the south of the road. The pilot received fatal injuries. The three passengers were removed from the aircraft by emergency services personnel and transported to hospital with serious injuries.

The afternoon before the flight, the operator requested fuel for the aircraft (160L in each of two tanks) but later amended the requirement to fill the fuel tanks to a new quantity of 120L in each tank. The trip fuel log found in the aircraft revealed that the pilot had entered the incorrect fuel total with annotations of 160L per fuel tank instead of the actual 120L per fuel tank.

The wreckage, engine and component examinations found no evidence of pre-existing mechanical defects, with the aircraft or its systems, that would have prevented normal aircraft operation prior to the accident.

Because of the initial fuel total error, the pilot would have expected to have 40L more remaining in each tank at the time the engine lost power.

In the absence of evidence of a mechanical failure leading to engine loss of power, the most likely cause of the engine loss of power was associated with fuel supply starvation or interruption.

Verification of the actual fuel quantity during pre-flight inspection would have alerted the pilot to the amended state of fuel quantity on board the accident aircraft. CASA produced an Advisory Circular in September 2001 on fuel planning as guidance for operators and pilots to help ensure correct pre-flight planning procedures and that aircraft carry sufficient fuel to safely complete each flight.

Fractured high pressure duct

Occurrence 200105701

The Boeing 767-300ER aircraft had departed Sydney for Honolulu on a scheduled passenger service. While on climb through flight level 105, the left engine fire warning light illuminated. The crew carried out the fire drill, shutting down the engine and discharging the engines' fire bottle number-1. Fire bottle number-2 was discharged shortly after due to the reactivation of the left engine fire warning. The fire warning lights continued to fluctuate on and off.

Air traffic control was advised of the emergency and issued a clearance for the aircraft to return to Sydney. After landing at Sydney, rescue and fire fighting services followed the aircraft to the parking area but were not required.

An examination by the operator revealed that a high pressure duct (Wye-Air Cooling Part No 1456M55G03) had fractured transversely through the shorter of two stub-sections. High-pressure, high-temperature air that had escaped from the cracked duct, impinged on wiring to the engine fire detection loop. The insulation of the wires was damaged and the wires disrupted. The duct that ruptured was part of the engine's stage 11 cooling system. Air is ducted from stage 11 of the high pressure compressor to cool the stage 2 high pressure turbine nozzles.

Examination of the duct by the ATSB determined that the duct rupture was a result of fatigue cracking consistent with high-cycle, vibratory loads. The crack initiated at the base of a reinforcing strap brazed to the duct neck. There was evidence of a mis-alignment of approximately 2 degrees in the connection of the fractured stub section to the adjoining section. There was no evidence of material or manufacturing defects.

Confidential Aviation Incident Reporting

THE CAIR system is an additional means of reporting aviation safety concerns available for people who believe that they cannot express their concerns to colleagues. While protecting a reporter's identity, CAIR can pass de-identified information to agencies that can take appropriate remedial action; this can include referring the information to ATSB for investigation. If you have a safety concern but are unsure of how to proceed, please do not hesitate to discuss the matter on 1800 020505.

John Robbins

Manager CAIR

Obese passengers and airline safety (CAIR 200206016)

A mother and her children were travelling economy class. The mother had been seated separate from the children and next to an extremely obese male passenger. The male passenger's obesity affected the mother's seating comfort, but her principal concern was that he was seated between her seat and the aircraft aisle. In the event of his incapacity in an emergency evacuation, she could have been trapped in her seat, as he was so fat that climbing over him would have been very difficult and he was too heavy to move.

CAIR Note: In discussion, the reporter stated that this was not the first occasion on which a family member had been seated next to an extremely obese passenger. On the previous occasion, a flight attendant had to move the obese passenger for the meal service, as there was insufficient room to lower the tray table in the passenger's allocated seat. The reporter expressed concern that the obese passenger could have become a serious obstruction in an emergency evacuation.

This report raises interesting legal issues. If the airline refused to carry a passenger on the grounds of obesity without legally-enforceable safety legislation to support the refusal, would the airline be liable under the Anti-Discrimination Act?

Recent information has been received indicating that CASA legal opinion is that an obese passenger who requires an extension seat belt can be classified as a handicapped person, as the need for an extension seat belt means that the passenger requires more assistance than a normal passenger. Requirements for carriage of handicapped persons are detailed in CAO 20.16.15. Paragraph 15.2(b) states that 'the operator shall ensure that handicapped persons are not seated in an aircraft where they could in any way obstruct or hinder access to any emergency exit by other persons on the aircraft'. Does 15.2(b) cover the case of an incapacitated obese person seated in an aisle seat obstructing or hindering access by passengers seated in the centre and window seats to the aisle during an emergency evacuation?

Response from CASA: The Authority has considered the issues raised. It is of the view that the carriage of obese persons on board an aircraft presents safety concerns only to the extent that some such persons might have mobility significantly below the norm, and thereby interfere with the rapid evacuation of the aircraft in an emergency.

It is possible that obese passengers who have reduced mobility might be characterised as handicapped for the purposes of the application of subsection 15 of Civil Aviation Order 20.16.3. Under that subsection, it is up to the aircraft operator to establish procedures to determine whether any particular person is handicapped, and to adopt appropriate risk-mitigation procedures for the carriage of those persons.

Naturally, such procedures need to be compliant with all legislation applying to the provision of transport services, including anti-discrimination legislation such as the *Commonwealth Disability Discrimination Act 1992*. The Authority does not express any view on the particular operator's procedures in this regard.

Response from operator: Currently there is no legislation requirement for the seating of obese passengers with the exception of exit row seating.

Should the CASA legal opinion be translated into a change in legislation the company will still have to comply with the Anti-Discrimination Act.

Changes to QNH settings under NAS (CAIR 200205402)

The area QNH for 15 November 2002 (noted at 1100 WST) for areas 60 & 61 (WA) was:

Area 60: SW of a line joining Jurien Bay/Dowerin/Pingelly 1003, NE of a line joining Yalgoo/Narembeen 1011, Rest 1007.

Area 61: W of a line joining Yeelirrie/Mount Day 1011, Rest 1013.

With the pending NAS changes to area QNH settings, the following scenario could occur.

Aircraft 1 departs Jandakot for Cunderdin, sets QNH 1003 (Local QNH at Jandakot).

Aircraft 2 departs Merredin for Jandakot, sets QNH 1011 (Area QNH this area, so local QNH is assumed to be the same)

Just west of Cunderdin, these aircraft would pass, and they could still have their original QNH settings, as they are both within 100 NM of the departure points. They would pass with an 8 hPa difference in their QNH settings, which equates to 240 ft.

ATC assumes an SSR derived level to be within tolerance if it is within 200 ft of reported. The minimum separation between these two aircraft should be 500ft, but given this scenario could be very close to zero.

Response from CASA: Using the example of the CAIR Report, CASA notes that aircraft one would use Jandalot Local QNH from the Automatic Terminal Information Service, pre and post National Airspace System (NAS) implementation. Aircraft two would use Merredin Local QNH, if known, or otherwise use the aerodrome elevation,

pre and post NAS. The Local QNH for Merredin in not known. CASA believes that the CAIR reporter makes the incorrect assumption that Area QNH and Local QNH in the Merredin area are the same.

CASA notes that, pre NAS, the system of altimeter settings for flights covering a large geographical area could have resulted in a pilot crossing over five or more Area QNH zones without changing altimeter settings since top of climb. Under the NAS, a pilot is required to use Local QNH within 100 NM of the aerodrome or use the current AREA QNH setting.

The CAIR reporter also claims the ATC assumes a secondary Surveillance Radar (SSR) derived level to be within tolerance if it is within 200 feet of the reported level. This statement is correct but has no bearing on the situation. SSR altitude information (Mode C) is transmitted to ATC equipment based on the standard setting of 1013.2 hpa. ATC equipment then correct this information based on a predefined automatic QNH sensor that is normally co-located with the radar.

Response from Airservices Australia: Prior to the implementation of the NAS revised altimetry procedures on November 28th, there was currently no requirements for VFR aircraft to change their altimeter setting once it was initially set for the flight. The scenario outlined in the CAIR Report is a situation that could have occurred prior to the NAS changes, as opposed to being a result of the changes.

The revised NAS altimetry procedures that have been introduced have actually decreased the likelihood of this situation occurring, in that, VFR aircraft are now required to revise their altimeter setting if the flight is longer than 100 NM.

Distribution of AIP Supplement

(CAIR 200204866)

I question the distribution system for AIP supplements, in particular H43/02 which referred to Military Exercise 'Southern Thunder', 21-25 October 2002. This supplement was distributed only to AIP holders. As a PPL holder who does not subscribe to AIP, I did not receive the supplement. I fly regularly and scrupulously self-brief using NAIPS. The current NAIPS information did indicate the activation of R976 and R977 as per H43/02. A check of the Airservices web page that links to AIP Sups and AIC (www.airservices.gov.au/pilotcentre/SpecialpilotOps/AIPSupsAICs.htm) revealed no reference to H43/02. This information could be found on another page buried within the Airservices website (www.airservices.gov.au/pilotcentre/ais/sup/sum.pdf). However, there were no links or indications concerning where to go to find H43/02. I think it is reasonable to expect a web page titled 'AIP Supps and AIC' to contain all relevant information. Only thorough diligence would have led me to take the further step of researching H43/02. Military exercises are rare in Victoria, adding to my indifference towards obscure references in the NAIPS briefing material.

I am horrified to think I could undertake a flight while not being able to access ALL relevant information, up front, by my primary briefing method.

I encountered two pilots (one operating IFR, one operating VFR) who were intending to go through the restricted areas as they had no knowledge of the area's activity. The IFR pilot spent 30 minutes on the ground while messages were passed to and from Melbourne Centre about why he couldn't proceed as planned to Mangalore. The pilot complained bitterly, and mentioned several times he had all current NOTAM material. Clearly, the elusive H43/02, was not part of that material. The amount of coordination, between the pilot and Melbourne Centre, imposed a significant workload on local ATS staff. The VFR pilot on a training flight to the area was totally unaware of H43/02.

I have encountered many pilots who are ignorant of current NOTAMs. There is no excuse for this, but it only reinforces my belief that there are many pilots out there blissfully unaware of H43/02, and in this case quite understandably.

The appropriate officer in Airservices was reported as saying that if you don't subscribe to AIP, then you can obtain the information from the website. When queried about the incompleteness of the Airservices web page (www.airservices.gov.au/pilotcentre/SpecialpilotOps/AIPSupsAICs.htm) the officer reportedly asserted that if you subscribed then you would know about www.airservices.gov.au/pilotcentre/ais/sup/sum.pdf. Not very helpful.

Response from Airservices Australia: In accordance with CAR 233, paragraph (1) (h) the pilot is responsible for obtaining all the appropriate operational information for the flight. For its part, Airservices Australia is responsible for creating and distributing aeronautical information to its customers and to make a profit to fund these activities (Airservices Act refers). It is not responsible for ensuring that pilots comply with CAR 233 – that is the role of CASA.

However, in the interests of safety and within the limits of its power, Airservices Australia provides limited 'free of charge' mechanisms for those individuals who act outside of the regulatory framework; subsequently, for most of 2002, AIP SUP & AIC have been distributing by subscription or AVFAX & web site. Simultaneously, there has been another 'trial and evaluation' site utilised for obtaining customer feedback on our new on-line initiatives.

Unfortunately, the CAIR reporter operated in the belief that all AIP SUP & AIC have been available on the web site. This was not a correct understanding. Those AIP SUP distributed by subscription were not necessarily made available on the web site, as those pilots 'in-the-system' were already deemed to have received the information by mail.

The confusion caused by this transitional issue are now eliminated by the lifting of the trial status of the on-line documentation, the consolidation of all current AIP SUP & AIC onto the site, and the issuance of an explanatory AIC (H6/02).

The CAIR reporter mentions that he does not subscribe to the Airservices Australia AIP/SUP/AIC, but perceives a safety issue with Airservices Australia rather than with his information provider. This curious circumstance must stem from the lack of regulations relating to other approved AIP providers.

The CAIR reporter also states, 'I have encountered many pilots who are ignorant of current NOTAMs'. This other disconcerting issue must stem from a lack of education and a disregard for the purpose of the law.

ATSB is part of the Commonwealth Department of Transport & Regional Services