Australian Government
Australian Transport Safety Bureau

Antenna failure involving Beechcraft King Air B200, VH-EEL

55 km west of Bankstown Airport, New South Wales, on 18 June 2025

ATSB Transport Safety Report
Aviation Occurrence Investigation (Short)
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Cover photo: Jet Aviation

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Acknowledgement of Country and Traditional Owners

The Australian Transport Safety Bureau acknowledges the traditional owners of country throughout Australia, and their continuing connection to land, sea and community. We pay our respects to them and their cultures, and to elders both past and present.

Investigation summary

What happened

On 18 June 2025, a Beechcraft King Air B200, registered VH-EEL, was on descent into Bankstown Airport, New South Wales, on a passenger transport flight with the pilot and 4 passengers on board when the pilot heard a whistling noise followed by the sound of an impact coming from the rear of the aircraft. There were no abnormal indications and the aircraft was flying normally, so the pilot continued the flight.

Shortly after, the pilot was unable to reach air traffic control via radio and switched to the aircraft's alternative radio. Communication was re-established and the aircraft landed safely. An external inspection of the aircraft found that the VHF antenna on top of the fuselage was missing, and the vertical stabiliser was damaged.

What the ATSB found

While the top of the antenna was not recovered, the aluminium antenna base showed evidence of moisture ingress. This resulted in the antenna failing and separating from the aircraft. The exact failure mechanism could not be determined – moisture could have been absorbed by the composite skin of the antenna, reducing its strength. Alternatively, observed corrosion could have weakened the bond between structural components within the antenna, reducing stiffness and allowing cracks to develop.

Safety message

While it is not clear whether pre-existing damage was observable during antenna inspections, this occurrence is a useful reminder on the importance of vigilance while conducting routine maintenance. In addition, it serves to demonstrate the value of redundancy in safety-critical systems.

The investigation

The ATSB scopes its investigations based on many factors, including the level of safety benefit likely to be obtained from an investigation and the associated resources required. For this occurrence, the ATSB conducted a limited-scope investigation in order to produce a short investigation report, and allow for greater industry awareness of findings that affect safety and potential learning opportunities.

The occurrence

On the afternoon of 18 June 2025, a Beechcraft King Air B200, registered VH-EEL, departed from Dubbo Airport, New South Wales, on a passenger transport flight to Bankstown Airport. The flight was operated by CJ Aerospace with the pilot and 4 passengers on board. It was a clear day and the aircraft was flying in visual meteorological conditions.

At approximately 1523, the aircraft was about 30 NM (55 km) from Bankstown Airport and descending through 11,000 ft when the pilot heard a whistling noise coming from the back of the aircraft. After a few seconds, the pilot reported hearing the sound of an impact towards the rear of the aircraft. The aircraft's airspeed was approximately 280 kt at the time. There were no abnormal indications in the cockpit and the aircraft was flying normally, so the pilot continued with the flight.

The aircraft had been previously cleared by air traffic control (ATC) to descend to 5,000 ft. However, after reaching this altitude it had not been cleared for further descent, which the pilot noted to be unusual. The pilot conducted a radio check with ATC but received no response. The pilot switched the aircraft's active VHF radio from COM 1 to COM 2, and contact with ATC was subsequently re-established. The rest of the approach and landing proceeded without incident and the aircraft landed at Bankstown Airport at 1534.

After landing, the pilot conducted an external inspection of the aircraft and found that the VHF antenna on top of the fuselage was missing, and the vertical stabiliser was damaged (Figure 1). Further information on the damage is in *Aircraft information* and *Antenna examination.*

Figure 1: Damage to the vertical stabiliser

Source: Jet Aviation

Context

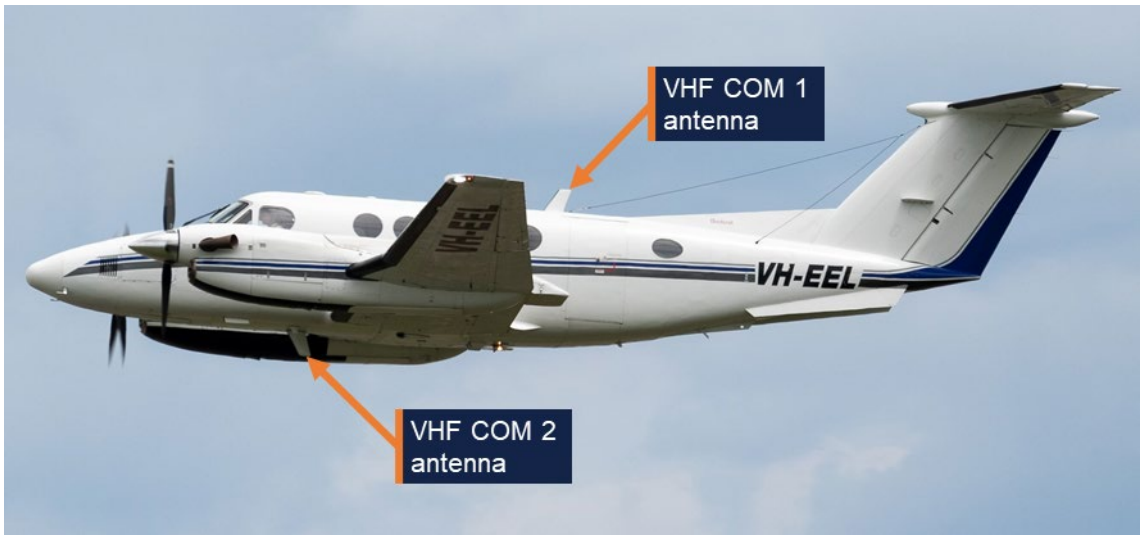
Pilot information

The pilot held a Commercial Pilot (Aeroplane) Licence, issued in December 2019, with a multi-engine aeroplane instrument rating. At the time of the occurrence, the pilot had approximately 1,980 hours total flying experience, of which 140 hours were accrued on the King Air B200.

Aircraft information

The Beechcraft King Air B200 is a pressurised, low-wing, twin turbine-engine aircraft. It has 2 VHF antennas: COM 1 is fitted on top of the fuselage, and COM 2 is underneath the fuselage (Figure 2). VH-EEL was manufactured in the United States in 2000 and registered in Australia in the same year. CJ Aerospace had been the registered operator of the aircraft since July 2021.

Figure 2: VHF antennas on VH-EEL



Source: CQ Plane Spotting

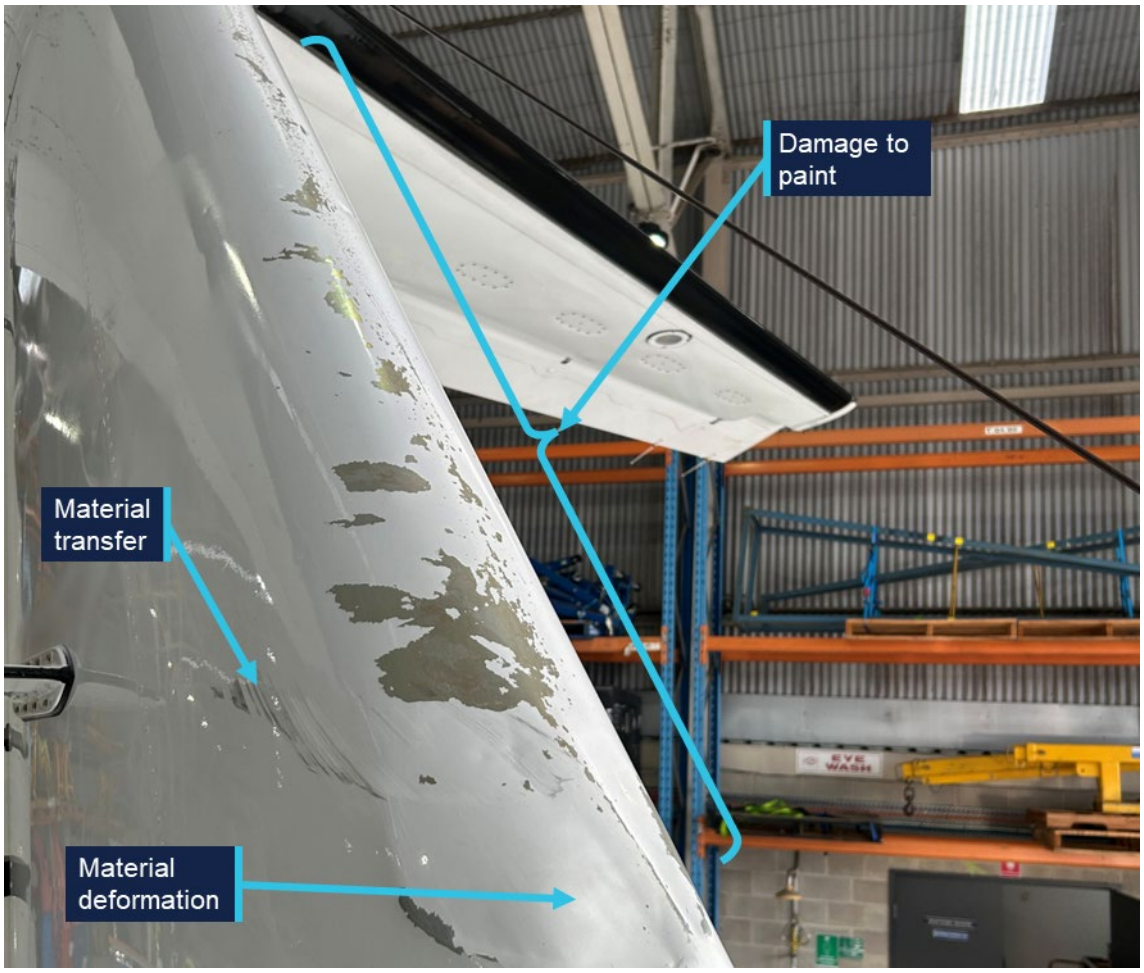
Aircraft examination

Following the occurrence, the aircraft was sent to a maintenance facility for examination and repair. The examination (not attended by the ATSB) identified that the leading edge of the vertical stabiliser had experienced deformation, and there was damage to the skin and paint on various parts of the empennage (Figure 3 and Figure 4). There also appeared to be some transfer of black material, possibly paint or rubber, onto the right side of the vertical stabiliser. The base of the antenna was still secured to the fuselage by 6 fasteners, but the glass fibre skin of the antenna had failed around each of the fasteners and separated from the aircraft (Figure 5).

Figure 3: Damage on the front of the empennage

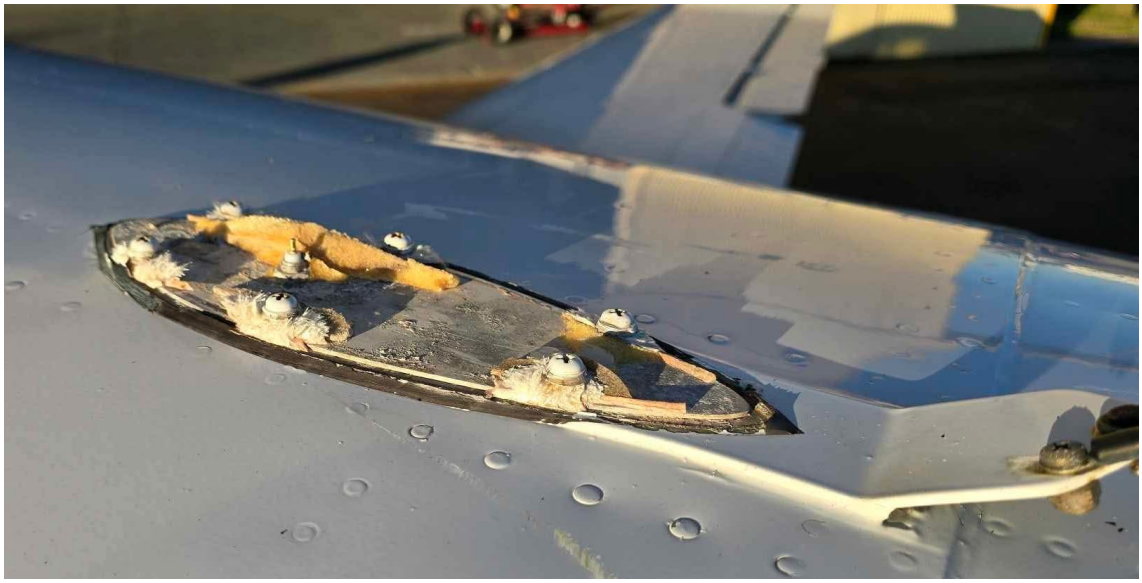
Source: Jet Aviation, annotated by the ATSB

Figure 4: Damage on the right side of the empennage



Source: Jet Aviation, annotated by the ATSB

Figure 5: The antenna base still secured to VH-EEL



Source: Jet Aviation

Antenna examination

The detached antenna was not located. The antenna base was examined at the ATSB's engineering facility in Canberra. The manufacturer's label indicated that it was manufactured by the Trivec-Avant corporation. The part number was 18-40-01 and the serial number was 11514. The antenna was not original to the aircraft, and its installation date could not be determined. The Trivec-Avant corporation ceased operation in about 2011, and no technical drawings or other details could be obtained for the antenna. However, images of an antenna with the same part number were sourced online (Figure 6). It comprised a base and upper structure with an internal electrical antenna.

Figure 6: Exemplar VHF COM antenna

Source: majorjunque (eBay)

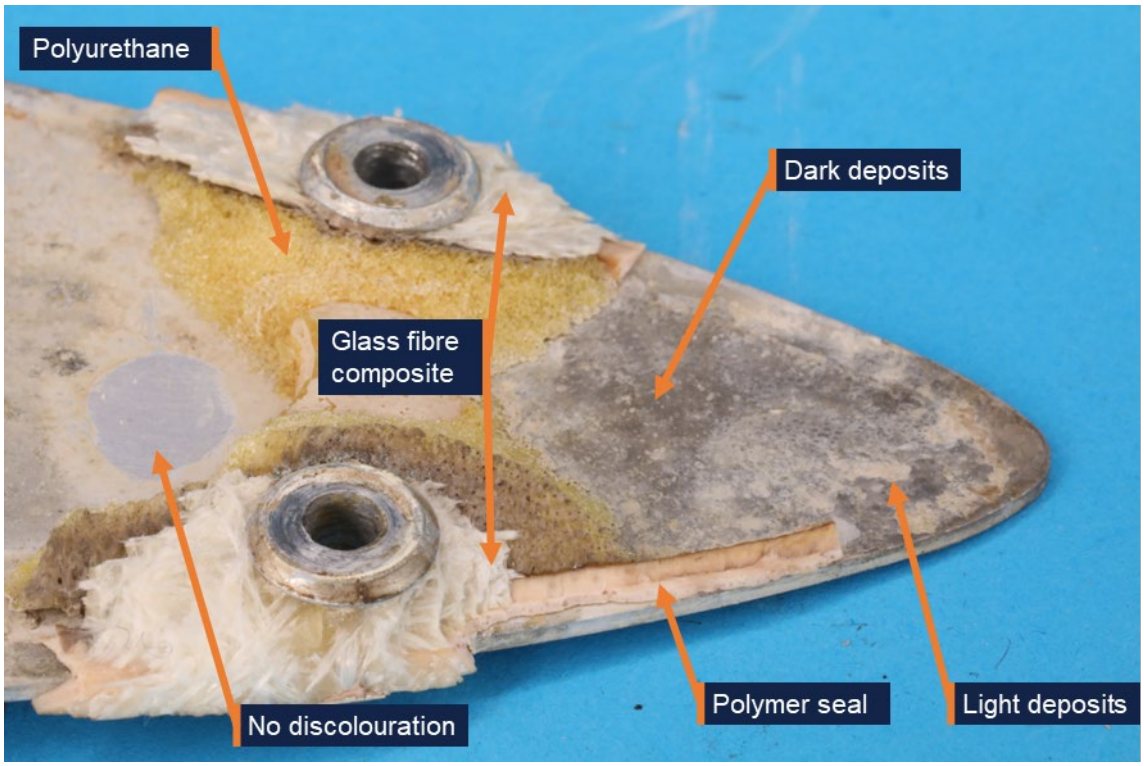
The antenna base from VH-EEL was an aluminium plate with 6 holes for fasteners and a central coaxial connection for the internal electrical antenna (Figure 7). A yellow foam adhered to the top face of the antenna was likely an expanding polyurethane product that was injected into the antenna during its construction in order to increase rigidity (Figure 8). Some fractured glass fibre composite material was observed around each of the fasteners. Fragments of a polymer seal were observed around the edges of the antenna base.

Figure 7: Antenna base from the aircraft

Source: ATSB

Both surfaces of the plate showed discoloration in several locations, identified as deposits on the surface of the metal (Figure 8). The deposits varied in colour. Samples of the dark-coloured and light-coloured deposits were scraped from the antenna using a plastic spatula and analysed for elemental composition using energy-dispersive X-ray spectroscopy (EDS). EDS analysis found that the composition of the light and dark deposits was very similar. Both predominantly contained aluminium, oxygen, and a smaller quantity of chlorine. The presence of chlorine indicated that the plate was exposed to salt water, resulting in corrosion of the aluminium plate, forming aluminium oxide.

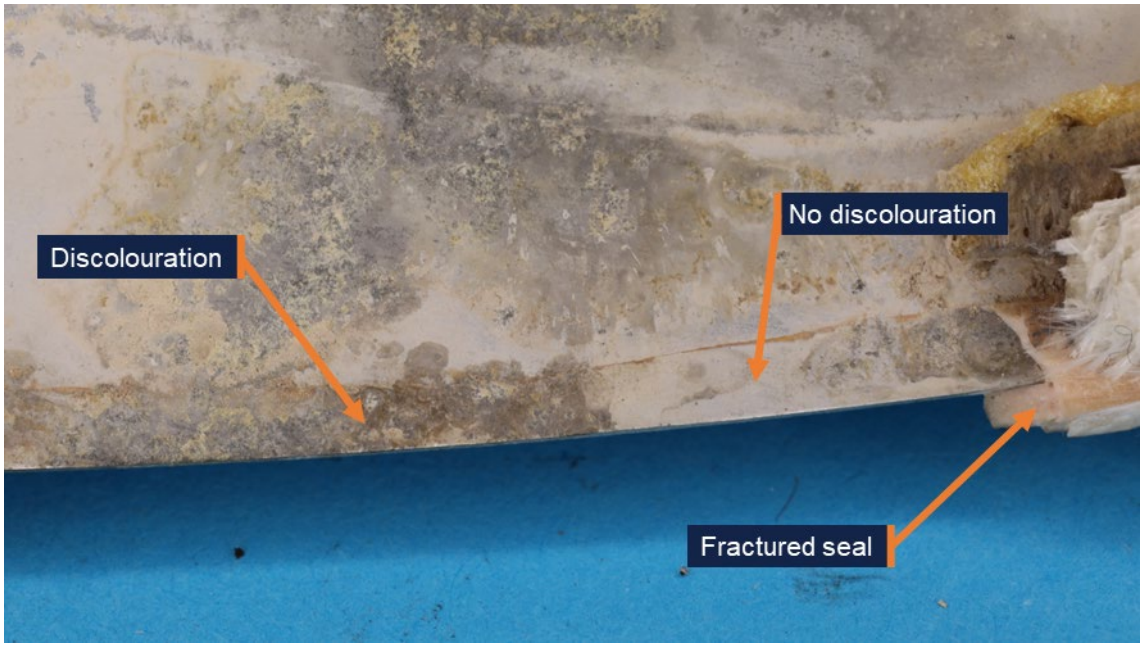
Figure 8: Aft end of the antenna base, top face



Source: ATSB

The discolouration was not uniformly distributed over the base, and there were some regions, such as the one shown in Figure 8, where there was no evidence of deposits or discolouration. Similarly, while much of the base's edge was discoloured, there were some regions underneath the polymer seal that appeared relatively unaffected (Figure 9).

Figure 9: Discolouration under the polymer seal, at the edge of the top face



Source: ATSB

Aircraft maintenance

The aircraft was maintained under a 4-phase inspection program over 800 flight hours or 24 calendar months. Each phase of routine maintenance was conducted sequentially every 200 hours. Inspection of the VHF antennas was conducted in Phase 3. The inspection required personnel to:

> …inspect all external antennas for leading edge erosion and condition of base seals.

This was last performed on 18 October 2024 with no relevant findings recorded.

The aircraft manufacturer provided guidelines for corrosion control inspections, which were optional and to be used depending on the operating environment. Regarding antennas, the inspection stated the following:

> ANTENNAS - Inspect antenna bases for proper sealing. Inspect antenna leading edges for severe erosion.

These inspections were also last carried out on 18 October 2024 with no relevant findings recorded.

Neither inspection specified whether antenna removal was necessary.

Similar occurrences

The aircraft manufacturer could not identify any previous instances of antenna separation in flight, but noted that ‘while it is rare, it is not unknown for antennas to crack at the fastener holes’.

Safety analysis

Based on the aluminium oxide and chlorine found on the surface of the VHF antenna base – a part of the antenna that should be fully enclosed and sealed – the antenna failed in flight due to pre-existing damage resulting from corrosion. The corrosion was almost certainly due to moisture ingress into the unit.

Since most of the antenna was not recovered, there was no way to determine the pathway through which moisture entered the antenna. Most of the seal surrounding the base had separated with the top half of the antenna. There was evidence of moisture under the seal in some regions, while some parts of the seal appeared to have prevented corrosion. The moisture under the seal could indicate a point of ingress, but it is possible that all the corrosion observed under the seals was due to moisture already inside the antenna, rather than evidence that the seal had been compromised.

Beyond the fact that the antenna cracked around the 6 fastener holes, the exact failure mechanism could not be determined. It is possible that corrosion weakened the bond between the polyurethane core and the base or skin of the antenna. This would have reduced the stiffness of the unit, allowing cracks to develop as it flexed during service. Alternatively, moisture could have been absorbed by the glass fibre composite skin, reducing its strength and increasing susceptibility to cracking.

Without an understanding of the mechanisms that led to moisture entering the antenna and the subsequent in-flight separation, it is not possible to determine whether any damage would have been externally visible during the relevant inspection 8 months

before the occurrence. Cracking around the fastener holes might not have commenced at that point. Alternatively, damage could have been too small to detect or obscured by the paint.

One alternative possibility to pre-existing damage could not be entirely ruled out: a birdstrike or collision with a remotely piloted aircraft (RPA) could have resulted in antenna separation. However, very few birdstrikes occur above 10,000 ft, and most RPAs are not certified to fly that high. No in-flight RPA loss was reported. There was also no visual evidence of a birdstrike, and any contact with bird or RPA would likely have resulted in a loud bang precipitating the occurrence, rather than a whistling sound followed by the sound of an impact.

Findings

ATSB investigation report findings focus on safety factors (that is, events and conditions that increase risk). Safety factors include ‘contributing factors’ and ‘other factors that increased risk’ (that is, factors that did not meet the definition of a contributing factor for this occurrence but were still considered important to include in the report for the purpose of increasing awareness and enhancing safety). In addition ‘other findings’ may be included to provide important information about topics other than safety factors.

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

From the evidence available, the following findings are made with respect to the antenna failure involving Beechcraft King Air B200, VH-EEL, 55 km west of Bankstown Airport, New South Wales, on 18 June 2025.

Contributing factors

- During flight, pre-existing damage due to moisture ingress resulted in the VHF COM 1 antenna failing and separating from the aircraft.

General details

Occurrence details

Date and time:	18 June 2025 – 1523 EST	
Occurrence class:	Incident	
Occurrence categories:	Avionics / Flight instruments, Objects falling from aircraft	
Location:	55 km 270 degrees from Bankstown Airport	
	Latitude: 33.9230° S	Longitude: 150.3935° E

Aircraft details

Manufacturer and model:	Raytheon Aircraft Company B200	
Registration:	VH-EEL	
Operator:	C J Aerospace Pty Ltd	
Serial number:	BB-1697	
Type of operation:	Part 135 Australian air transport operations - Smaller aeroplanes-Standard Part 135	
Activity:	Commercial air transport-Non-scheduled-Passenger transport charters	
Departure:	Dubbo Airport, New South Wales	
Destination:	Bankstown Airport, New South Wales	
Persons on board:	Crew – 1	Passengers – 4
Injuries:	Crew – Nil	Passengers – Nil
Aircraft damage:	Minor	

Sources and submissions

Sources of information

The sources of information during the investigation included:

- the pilot
- CJ Aerospace
- Textron Aviation (Beechcraft)
- the aircraft maintenance organisation
- the maintenance organisation that examined the aircraft following the occurrence
- Civil Aviation Safety Authority
- Flightradar24.

Submissions

Under section 26 of the *Transport Safety Investigation Act 2003*, the ATSB may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. That section allows a person receiving a draft report to make submissions to the ATSB about the draft report.

A draft of this report was provided to the following directly involved parties:

- the pilot
- CJ Aerospace
- the aircraft maintenance organisation
- Civil Aviation Safety Authority
- Textron Aviation (Beechcraft)
- National Transportation Safety Board (United States).

There were no submissions received.

About the ATSB

The **Australian Transport Safety Bureau** is the national transport safety investigator. Established by the *Transport Safety Investigation Act 2003* (TSI Act), the ATSB is an independent statutory agency of the Australian Government and is governed by a Commission. The ATSB is entirely separate from transport regulators, policy makers and service providers.

The ATSB's function is to improve transport safety in aviation, rail and shipping through:

- the independent investigation of transport accidents and other safety occurrences
- safety data recording, analysis, and research
- influencing safety action.

The ATSB prioritises investigations that have the potential to deliver the greatest public benefit through improvements to transport safety.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and Regulations and, where applicable, international agreements.

Purpose of safety investigations

The objective of a safety investigation is to enhance transport safety. This is done through:

- identifying safety issues and facilitating safety action to address those issues
- providing information about occurrences and their associated safety factors to facilitate learning within the transport industry.

It is not a function of the ATSB to apportion blame or provide a means for determining liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings.

At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

The ATSB does not investigate for the purpose of taking administrative, regulatory or criminal action.

About ATSB reports

ATSB occurrence investigation reports are organised with regard to international standards or instruments, as applicable, and with ATSB procedures and guidelines.

An explanation of ATSB terminology used in this report is available on the ATSB website.