

Australian Government Australian Transport Safety Bureau

Loss of control and collision with water involving Cessna 210 VH-EFB

160 km south-west of Darwin, Northern Territory | 1 April 2013



Investigation

ATSB Transport Safety Report

Aviation Occurrence Investigation AO-2013-063 Final – 7 November 2013 Cover photo: Occupant of aircraft in same area as VH-EFB at the time of the occurrence.

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Addendum

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Safety summary

What happened

On the morning of 1 April 2013, the pilot of a Cessna 210 was one of a group intending to fly various light aircraft under the visual flight rules from Bullo River homestead to Emkaytee, a private airstrip near Darwin, Northern Territory. Low cloud delayed all of the departures from Bullo River and the aviation forecasts and weather radar images accessed by the group via the internet indicated isolated thunderstorms, low cloud, and rain in the intended area of operation. Some improvement was forecast after 1130 local time.

Weather in area of accident



Source: Bureau of Meteorology

By lunchtime the weather had lifted at Bullo River and the pilots observed that the weather radar images were indicating an improvement en route. All of the pilots departed between 1300 and 1500, some electing to track via the coast and the rest tracking as required more or less on the direct track. The pilot of the Cessna 210 departed at about 1415 with three passengers to track via the coast.

The pilots in the group were communicating by radio on a discrete frequency and the Cessna 210 pilot was heard to report at about 1510 that he was approaching Cape Ford and the weather ahead was gloomy, or words to that effect. That was the last radio transmission from the pilot.

When the aircraft did not arrive at Emkaytee a search was initiated. Bodies and a small amount of wreckage were found on the southern shoreline of Anson Bay, about 10 km south-east of Cape Ford. There were no survivors.

What the ATSB found

During the flight from Bullo River to Emkaytee, the pilot continued to track along the planned coastal route towards a thunderstorm, probably encountering conditions such as low cloud, reduced visibility and turbulence, and as a result of one or more of those factors the aircraft descended and collided with water.

Safety message

Tracking visually via a coastal route in marginal weather conditions can be advantageous in terms of ease of navigation and absence of elevated terrain, but can also increase the risk of spatial disorientation in the context of drastically reduced visibility exacerbated by a lack of surface definition when over water.

In situations where significant weather is forecast or otherwise expected, pilots are encouraged to access the Bureau of Meteorology detailed weather briefings (via the phone number on the area forecast) to assist with understanding the conditions at the time as well as the immediate trend.

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The occurrence

On 28 and 29 March 2013, a group of pilots flew various light aircraft from Emkaytee airstrip (near Darwin) southward to Bullo River homestead in the Northern Territory. On board the aircraft for the private flights were family members and friends travelling as a group to Bullo River to stay over the Easter long weekend for recreational and social activities.

The flights on both days were conducted under the Visual Flight Rules (VFR) and were affected by areas of low cloud and reduced visibility such that the pilots diverted to the west towards the coast to avoid the higher ground and weather on the direct track. On the second day of the outbound flights, the pilot of the lead aircraft in the group encountered bad weather in the Bullo River area and diverted to Palumpa (Nganmarriyanga) airstrip, 123 km to the north of Bullo River. Weather information was shared via radio among the other pilots in the group and they all decided to land at Palumpa also. After a wait of an hour or so on the ground, the pilots ascertained that the weather in the Bullo River area had improved. The pilots departed in turn and tracked initially westward of the direct track to arrive at Bullo River without further delay.

The return flights were arranged for the morning of 1 April 2013. However, when the pilots assessed the weather in the morning they found there was low cloud on the hills surrounding the Bullo River airstrip and the forecast weather en route was considered unfavourable for VFR operations. The pilots also had access to weather radar images from the internet that confirmed the adverse weather pattern. It was agreed among the pilots that the departures would be delayed. The option of staying another night was readily available.

During the morning the group packed up and some engaged in recreational activities until lunchtime when there was another opportunity for the pilots to reassess the weather as a group. It was apparent that the weather had improved at Bullo River and the weather radar imagery was indicating better conditions inland of the coast (Figure 1 shows the weather radar image available at 1205 Central Standard Time¹ – it was not necessarily the actual image the pilots viewed). The forecast weather for Darwin showed an improvement in the afternoon with a subsequent deterioration by evening. There was discussion about the best track to take with the person with the most local knowledge recommending a coastal track via Wadeye and Dundee Beach to avoid the higher terrain on the direct track. All of the pilots seemed comfortable with departure that afternoon and were aware that they could return to Bullo River to overnight if required.

Although in a group and sharing information, the pilots were making their own operational decisions. One of the pilots, operating the only Cessna 210 (registered VH-EFB) in the group, was reported to have based his pre-flight planning on the coastal track. Two other pilots planned to track coastal for weather or sightseeing reasons, while the other pilots generally waited until they assessed the weather airborne.

All of the aircraft were refuelled to full tanks and the aircraft readied for departure. The Cessna 210 pilot was observed to conduct a daily inspection including a check for water in the fuel tanks. Pilots departed once their aircraft and passengers were ready.

The Cessna 210, with the pilot and three family members on board, was the third aircraft to depart. Some of the other pilots watched or heard the take-off, which appeared normal in all respects. The time was about 1415. All of the pilots had departed by 1500.

¹ Central Standard Time (CST) was Coordinated Universal Time (UTC) + 9.5 hours.



Figure 1: Weather radar image as of 1205 (nominal coastal track and direct track overlaid) Copyright: Image by Bureau of Meteorology. For related Warnings, see www.born.gov.au

Once all the aircraft were established on their respective tracks the pilots advised their positions and intentions on a discrete radio frequency to facilitate separation from each other and share weather information. The pilots who had not planned to track coastal unless required found that the weather on the direct track was generally suitable for visual flight.

At about the halfway point the pilots encountered an area of low cloud and rain in storms that stretched from Cape Ford south-east towards the inland direct track, a distance of about 100 km. As they came up to the area the pilots on the direct track diverted slightly to the east (right of track) to get around the cloud mass. Those pilots broadcast their intentions and reported the existence of good visibility and cloud base to the east (right of track) and ahead of the stormy weather.

Of the three aircraft on the coastal track, two pilots tracked inland in response to the weather they could see and the broadcasts from other pilots. One of these pilots manoeuvred around the weather and established himself on the direct track. The other pilot found a gap though the storms by tracking inland of the coast and continued onto the mouth of the Daly River, then resumed a coastal track in relatively clear conditions.

At some point the pilot of the Cessna 210 broadcast his position and intentions. This radio call, on the discrete frequency used by the group, was heard by a number of the other pilots at about 1510. Communications made on that frequency were not recorded, but the general consensus

Source: Bureau of Meteorology and ATSB

was that the pilot reported approaching Cape Ford at 500 ft and that the weather ahead was gloomy, or words to that effect. The pilot did not sound distressed and at the time no importance was attached to the call. However, that was the last time anyone heard from the Cessna 210.

The other aircraft in the group continued on their respective tracks to Emkaytee with a small diversion required due to a small storm about 50 km before the destination. After arrival of all the other aircraft the pilots realised that the Cessna 210 had not arrived. The search and rescue authorities were notified and some pilots from the group departed in a few aircraft to search the area where the pilot last reported and to check the airstrips in the area.

Searching in the Cape Ford area was not possible due to continuing storm activity, and fading light forced the return of the search aircraft. The searching resumed the next morning until some bodies and a small amount of wreckage from the aircraft were found on the southern part of Anson Bay, about 10 km south-east of Cape Ford. There were no survivors.

No more sightings of aircraft wreckage were made until October 2013, when wreckage was sighted in Anson Bay at low tide, about 2 km from the southern shoreline where debris had been found. Northern Territory police attended the site and collected information that confirmed that the wreckage was VH-EFB.

Context

Pilot information

The Cessna 210 pilot was appropriately qualified for the flight under the Visual Flight Rules (VFR) as planned. The pilot did not hold an instrument rating and it was likely that the pilot's only instrument flying experience was during the 3-hour instrument instruction required for a private pilot licence, conducted at least 3 years prior to the accident.

The Cessna 210 pilot had owned the aircraft for just over 12 months and had done about 300 hours flying in the aircraft in that time. That flying comprised mostly cross-country flights for business reasons over a period that included two wet seasons in the northern part of Australia. The pilot was known as a cautious pilot who took minimal risks in regard to weather.

The Cessna 210 pilot was one of the pilots who flew from Emkaytee to Bullo River on the Thursday and again on the Friday. The pilots in the group reported that the Cessna 210 pilot had acted responsibly over the weekend and had gone to bed at a reasonable time the evening before the accident. On the day of the accident the Cessna 210 pilot engaged in discussions about the weather and did not express any pressing need to complete the flight that day.

Aircraft information

The previous owner of the aircraft reported that it was reliable, relatively fast, and was sensitive in pitch (tendency for the nose to diverge up or down), which meant that the aircraft could lose height rapidly in a turn. Another pilot who was familiar with the aircraft considered it to be reliable with the only recent maintenance issue being a hydraulic oil leak that had affected the retractable landing gear. The aircraft's maintenance records gave no indication of any defects and no pattern of recurring unserviceability.

In addition to the flight instruments required for VFR-category operations, the aircraft was equipped with an attitude indicator, vertical speed indicator, and directional indicator. It is likely that those instruments were functional, but the aircraft was not certified for flight in instrument meteorological conditions.

The aircraft was also equipped with an autopilot that provided lateral control (essentially wing levelling) with heading hold, but no pitch control (nose up/down) or altitude hold as provided by some autopilots. There was no indication that the autopilot was not serviceable.

The pilot was reported to have used a portable Global Positioning System (GPS) receiver for navigation information in preference to a second GPS receiver that was mounted in the aircraft's instrument panel. There were no reports of GPS outages during their flights from the other pilots in the group.

Based on a nominal coastal track with no diversions and the aircraft's normal performance, the flight to Emkaytee should have taken less than 2 hours. The Cessna 210 was reportedly refuelled to full tanks before departing from Bullo River, providing enough useable fuel for a maximum flight time of 5.5 hours. The fuel on board would have given the pilot up to 3 additional hours of flight time without drawing on reserve fuel.²

² Civil Aviation Advisory Publication (CAAP) 234-1 Guidelines for Aircraft Fuel Requirements indicated that VFR flights in aeroplanes such as the C210 should carry 45 minutes of fixed fuel reserve.

Meteorological information

Pilot briefing material

The aviation forecast applicable to the area between Bullo River and Darwin was issued by the Bureau of Meteorology at 0634 with validity until 2000. In that area, isolated thunderstorms, scattered showers, and areas of rain were expected throughout the forecast period. Areas of low cloud and drizzle were also expected over land until 1130. In rain, visibility would be reduced to between 2,000 m and 500 m depending on the intensity of any showers. On the bottom of the forecast was a phone number from which a more detailed weather briefing from a duty forecaster was available.

An aerodrome forecast was not available for Bullo River. The forecast for Port Keats aerodrome at Wadeye, particularly relevant to the coastal track, was for low cloud and rain with an easing of the low cloud after 1130. In addition, sustained periods of thunderstorms with associated wind gusts, low cloud and rain, were expected throughout the day.

While an aerodrome forecast was not available for Emkaytee, the forecast for nearby Darwin Airport is a useful reference. At Darwin, intermittent periods of wind gusts, low cloud and rain were forecast from 0930 to 1530. From 1530 onwards, there was 30 per cent probability of sustained periods of thunderstorms with associated wind gusts, low cloud and rain.

Other meteorological information

The Bureau of Meteorology advised that on the day of the accident a low pressure system was located in Joseph Bonaparte Gulf, west of Wadeye. On the eastern flank of the system, converging low level winds and a moist unstable atmosphere contributed to persistent thunderstorms in the Cape Ford/Anson Bay area, north of Wadeye. This activity is evident in the weather radar images at 1205 in Figure 1, and later in Figures 2 and 3.

Weather radar detects rainfall and where rain is identified renders the area in colour proportional to intensity. It should be noted that the greater the distance from the radar, the higher the minimum height at which the radar can detect weather. This means that the rainfall showing up in the Cape Ford/Anson Bay area is at a height of least 10,000 ft and therefore may not represent any rainfall emanating from lower cloud.





Source: Bureau of Meteorology and ATSB

A false-colour infrared satellite image (Figure 3) is an enhancement of the basic greyscale infrared satellite image and provides information on the temperature of the underlying surface or cloud. Post-image processing for this type of image applies colour ranges to the cold end of the temperature scale, to highlight the deep atmospheric convection typically associated with thunderstorms.

Figure 3: False-colour infrared satellite image at 1500, about the time of the accident (nominal coastal track and direct track overlaid by ATSB with the likely accident site area circled)



Source: Bureau of Meteorology

The other pilots in the group flying from Bullo River to Emkaytee reported cloud and rain in areas that correlated to the radar and satellite imagery. Some of the aircraft occupants photographed the cloud formations and rain associated with the storms in the vicinity of Cape Ford (Figures 4 and 5).

Figure 4: View from an aircraft in the group as the pilot navigated between storms about 40 km south-east of Cape Ford



Source: Aircraft occupant

Figure 5: View from another aircraft in the group as the pilot navigated around the storms about 80 km south-east of Cape Ford



Source: Aircraft occupant

Wreckage information

April 2013

During the search a small amount of wreckage was recovered from various locations along the southern shoreline of Anson Bay to the south-east of Cape Ford. No significant aircraft structure or major assemblies such as engine or propeller were found at that stage.

The bulk of the recovered wreckage comprised light items from the cabin interior along with a small amount of baggage and the pilot's flight bag. A number of aeronautical charts and operational documents were still in the damaged flight bag. Life jackets were found, unused, in supplier packaging.

Only two aircraft components were available for examination. A push/pull tube, most likely from the wing flap system, had sustained significant damage consistent with overstress. Fragments of the battery case, which comprised no more than 20 per cent of the whole, showed no evidence of any material or electrical anomalies.

October 2013

The wreckage found in October 2013 was spread over a few hundred metres (Figure 6). The airframe was extensively fragmented with elements of the wings, fuselage, and seats identified. The engine and propeller, separated from the rest of the wreckage, were damaged but largely complete. As a result of the fragmentation, submersion, and tidal action, there was little additional information available.

Figure 6: Aircraft wreckage in October 2013



Source: Northern Territory Police, Fire and Emergency Services

Other occurrences

A search of the ATSB database for occurrences involving a VFR pilot encountering instrument meteorological conditions in the 10 years prior to the accident yielded 139 occurrences. Of these, nine were fatal.

One of the fatal accidents occurred on 17 November 2007 when the pilot of a Cessna 337, registered VH-CHU, was tracking along the coast from Moorabbin, Victoria to Merimbula, New South Wales. In its investigation into this occurrence, the ATSB found that while manoeuvring over water at low level in conditions of reduced visibility, the pilot probably became spatially disorientated and inadvertently descended into the water. The investigation report on this occurrence, number AO-2007-061, is available at www.atsb.gov.au.

Safety analysis

Introduction

In the absence of any information from the pilot after the radio transmission approaching Cape Ford, and without substantial wreckage to examine, there was limited evidence available with which to determine the factors that contributed to the fatal collision with water. From the evidence that is available this analysis will determine the most likely factor(s) in the occurrence and identify any safety factors or other information that may be able to be applied to their operations by other pilots to reduce risk.

Collision with water

It is evident from the fragmentation and distortion of the items recovered from the aircraft that there was a high degree of force involved in the collision with the water. Without knowing any specific details, that type of impact is almost certainly related to an inadvertent descent into the water. Such a descent invariably results from pilot unawareness of an aircraft's trajectory towards the water or pilot inability to alter that trajectory.

For a pilot who is trained and qualified for flight under the Visual Flight Rules (VFR) only, the primary method of perceiving an aircraft's trajectory is by reference to the natural horizon and the ground or water. A secondary method for a VFR pilot (in abnormal situations and with suitable aircraft instrumentation) is by reference to flight instruments. In this occurrence, the aircraft was equipped with the necessary instruments for basic instrument flying, but the pilot did not hold an instrument rating and was not experienced in instrument flying. Given this context, it is unlikely that the pilot would have been able to maintain control of the aircraft solely by reference to instruments.

Another method of aircraft control in low visibility is to utilise an autopilot if available. The Cessna 210 was equipped with an autopilot that was probably serviceable but essentially limited to levelling the wings without any altitude-keeping capability. Therefore, the autopilot was not capable of providing effective protection from an inadvertent descent and the wing-levelling function would probably be compromised by any severe turbulence.

Given the pilot's report approaching Cape Ford, the thunderstorm in that area and the bodies and wreckage being found in adjacent Anson Bay, the Cessna 210 pilot probably encountered low cloud, rain and some degree of turbulence. In that situation, with the horizon obscured, the pilot would have been reliant on what he could see of the ground or water in the immediate area of the aircraft. At some point the aircraft was over water and due to a combination of a relatively featureless surface and reduced visibility the pilot was at a high risk of becoming spatially disoriented. Assuming this occurred, the Cessna 210 would have developed a trajectory towards the water, probably without the pilot realising that the aircraft was descending from its low cruise height.

The other possibility is that pilot was aware of a descent towards the water but was unable to sufficiently control the aircraft. In the context of the occurrence, with no indication of any mechanical problem with the aircraft and no pilot-incapacitation risk factors, such loss of control would presumably be associated with severe turbulence generated by the thunderstorm. This might have overwhelmed the pilot's control inputs or, in combination with sufficient aircraft speed, overstressed the aircraft to the extent that it sustained an in-flight break-up.

Based on the available information, it is apparent that the Cessna 210 pilot continued to track along the coast towards a thunderstorm and probably encountered low cloud, reduced visibility and possibly severe turbulence. As a result of one or more of those factors, the pilot inadvertently allowed the aircraft to descend and collide with water.

Managing weather risk

Once the Cessna 210 pilot was within the area influenced by the thunderstorm he was at a high risk of spatial disorientation or otherwise losing control. Based on the other pilots' information and official weather assessments, this would have been a visibly threatening weather formation. It is not clear why the pilot decided to continue on the coastal track when the other pilots in the group were reporting suitable weather conditions on or about the direct track, and other pilots who were initially on the coastal track were diverting inland.

In relation to managing the risk of weather generally, the Cessna 210 pilot had operational experience in two north Australian wet seasons and had demonstrated an aversion to flying in weather conditions that may have been unsuitable for VFR. On the flights to Bullo River on the Thursday and Friday before the accident, the pilot diverted around weather and on the Friday landed at an alternate airstrip to wait for the weather to improve.

On the day of the accident the pilot had access to the relevant aviation forecasts, weather imagery, and advice from pilots with local experience. Although successive radar images showed the weather improving inland but persisting in the Cape Ford area, the pilot was likely influenced by local experience and his own experience on the recent flights to Bullo River to plan via the coastal track as a conservative response to the threat of en route weather. Along with the other pilots in the group, the Cessna 210 pilot departed Bullo River with ample fuel for diversions and an onboard global positioning system for navigational orientation. There is no evidence of sub-standard planning or reckless decision making.

One information source not consulted by the pilots in the group was the duty forecaster at the Bureau of Meteorology. This person, based at Darwin in this case, was contactable via the phone number on the area forecast. The forecaster was able to supplement the forecast and weather reports with analysis of the immediate situation and any trend. This service is not utilised much by private pilots but it is available to all aviators. A more detailed briefing might not have made any difference in this case, but the bureau did report that they were aware at the time that the system over Cape Ford was regenerating in the same location and was likely to be an ongoing threat.

Once the flight was underway the pilot needed to regularly reassess the weather situation with regard to the view outside the cockpit and any other available information such as pilot reports. Without being on the Cessna 210 track at the same time it is not possible to fully appreciate the pilot's view of the weather on the approach to Cape Ford. That said, there doesn't seem to have been any impediment to a course reversal but the pilot didn't take it or decided to take it too late.

Tracking visually via a coastal route in marginal weather conditions can be advantageous in terms of ease of navigation and absence of elevated terrain, but can also increase the risk of spatial disorientation in the context of drastically reduced visibility exacerbated by a lack of surface definition when over water.

In situations where significant weather is forecast or otherwise expected, pilots are encouraged to access the Bureau of Meteorology detailed weather briefings (via the phone number on the area forecast) to assist with understanding the conditions at the time as well as the immediate trend.

Findings

From the evidence available, the following findings are made with respect to the collision with water involving Cessna 210, registered VH-EFB, that occurred approximately 160 km south-east of Darwin, Northern Territory on 1 April 2013. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

Contributing factor

• During the flight from Bullo River to Emkaytee, the pilot continued to track along the planned coastal route towards a thunderstorm, probably encountering conditions such as low cloud, reduced visibility and turbulence, and as a result of one or more of those factors the aircraft descended and collided with water.

General details

Occurrence details

Date and time:	1 April 2013 – Approximately 1515 CST		
Occurrence category:	Accident		
Primary occurrence type:	Collision with water		
Location:	Latitude: 13° 31.26' S	Longitude: 129° 59.57' E	

Pilot details

Licence details:	Private Pilot (Aeroplane) Licence, issued April 2010	
Endorsements:	Manual Propeller Pitch Control; Retractable Undercarriage; Single Engine Aeroplanes less than 5,700 kg Maximum Take-off Weight	
Ratings:	Nil	
Medical Certificate:	Class 2, valid to October 2013	
Aeronautical experience:	Approximately 500 hours	
Last flight review:	February 2012	

Aircraft details

Manufacturer and model:	Cessna Aircraft Company C210H		
Year of manufacture:	1967		
Registration:	VH-EFB		
Operator:	Private		
Serial number:	21058966		
Total Time In Service	5,022 hours (as of last 100-hour inspection, October 2012)		
Type of operation:	Private		
Persons on board:	Crew – 1	Passengers – 3	
Injuries:	Crew – 1 (fatal)	Passengers – 3 (fatal)	
Damage:	Destroyed		

Sources and submissions

Sources of information

The sources of information during the investigation included the:

- other pilots in the group
- Bureau of Meteorology (BoM)
- Civil Aviation Safety Authority (CASA).

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003* (the Act), the Australian Transport Safety Bureau (ATSB) may provide a draft report, on a confidential basis, to any person whom the ATSB considers appropriate. Section 26 (1) (a) of the Act 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 some of the other pilots in the group returning to Emkaytee that afternoon, the BoM and CASA. Submissions were received from the BoM and CASA. The submissions were reviewed and where considered appropriate, the text of the report was amended accordingly.

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

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

Purpose of safety investigations

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine 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.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.

Australian Transport Safety Bureau

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