





PACDEFF & AAvPA 2025

Montague Street Bridge
South Melbourne



- Montague Street Light Rail Bridge, South Melbourne
- Inner urban, close to a major off-ramp of the M1 motorway
- Heavy commuter and industrial traffic
- Clearance of just three metres (9.84 feet) between the road surface and the lowest part of the bridge

Safety & Organisational Accountability

Montague Street Bus Accident

February 2016



- On 22 February 2016, a bus from Ballarat (a regional city 110 km from Melbourne) struck the bridge while travelling at 56 km/h (35 mph) in a 60 km/h zone.
- The bus, 3.8 metres high, was carrying 14 passengers, 11 of whom were taken to hospital, with six of those seriously injured.
- The bus driver, who was also from Ballarat, stated that he had been confused while driving in a very busy and unfamiliar inner urban area and didn't notice warning signs in the lead up to the bridge.
- The bus driver was charged by police and in December 2018 he was incarcerated for five years and three months after a jury found him guilty of negligently causing serious injury.



(Image: Jason South)

Montague Street Bus Accident

Trial October 2018



- At the bus driver's trial, the bus company's founder testified that the driver had been "let down by the company" in not advising him of driving conditions in the area.
- The sentencing judge rejected these assertions, stating that it was "astonishing" that the driver did not see the bridge, telling him:
"Three passengers saw the bridge. How you did not is astonishing."
"Why you were so grossly inattentive is unknown to me".
- The judge concluded:
"Employers cannot be blamed for the obvious failings of employees".



(Images: Jason South)



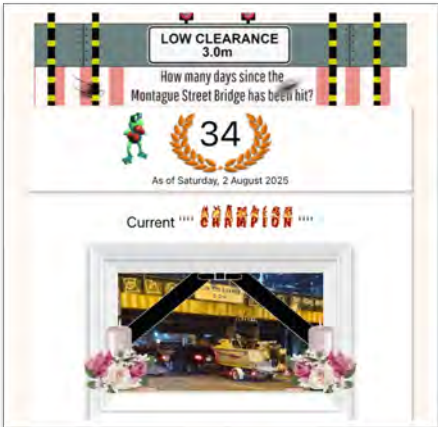
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The Infamous Montague Street Bridge

South Melbourne

<https://howmanydaysincemontaguestreetbridgehasbeenhit.com>

- The Montague Street Bridge is so notorious that it has its own website, which records strikes on the bridge by various vehicles and how many days have passed since it was last hit.
- On average the bridge is struck once every 43.3 days, with a median of 26.5 days between strikes
- In 2016 the bridge was struck by vehicles 11 times, including this bus crash. In 2022 it was struck 15 times.
- So far 2025 has been a good year with only six hits.
- As of this morning it is currently 44 days since the bridge was last hit...





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Montague Street Bus Accident

Driver released October 2019

- In October 2019, after serving more than 300 days of his sentence, an appeals court ordered the driver to be released after it found he had suffered a “miscarriage of justice”



(Image: ABC News)

(Image: Joe Armao)

Safety & Organisational Accountability



Air New Zealand TE901 Mt Erebus, Antarctica 28 November 1979



At about 08:30 NZDT on 28 November 1979 Air NZ Flight TE901 departed Auckland for an 11-hour return sightseeing flight to Antarctica.

The McDonnell-Douglas DC-10 flight was scheduled to arrive over Antarctica between 12:00 and 13:00 NZST, and from around midday it had ongoing contact with the US Navy's ATC centre at McMurdo Station, and the 'Ice Tower' at nearby Williams Field.

At 12:45 NZST the crew advised Mac Centre

that the aircraft was at 6,000 to 2,000 ft (610 m) in VMC.

This was the final communication.

Four minutes and 42 seconds after 12:50 NZST, the aircraft crashed into the snow of Mt Erebus, killing all 257 people on board.

After several hours of radio silence, it became obvious that there was a problem. The aircraft didn't return to the base. Operation Overdue was launched.



PARF TWO RZYXZB 4152 UNCLAS RZYXZB/RZF REP NEW ZEALAND CHRISTCHURCH NZ 0000P (Message received from McMurdo Base just after midnight on 29 November)

BT UNCLAS //RZ5001//RRPR-3 Pinnacle/0910

1. INCIDENT: OVERDUE COMMERCIAL AIRCRAFT OVER CONTINENTAL ANTARCTICA.
 2. REFERENCE: 281032Z NOV 79
 3. LOCATIONS: VICINITY OF MCMURDO STATION, ANTARCTICA. ESTIMATED POSITION: THREE EIGHT NAUTICAL MILES THREE NORTH OF MCMURDO.

4. REP DATA:
 A. 20-03 LOCATED WRECKAGE AIR NEW ZEALAND FLT NZ 901 AT FAWG RIDGE, ROSS ISLAND, ANTARCTICA (77 DEG 26 MIN S 157 DEG 27 MIN E) AT 081000Z. INITIAL REPORT INDICATES NO APPARENT SURVIVORS. PLAN FIELD DRAFTY IN SV W/O ASDP.
 B. RESOURCES W/IN, W/IN AND O/A OF THIS INCIDENT SHOULD REAR P/IAL, P/IL, AND D/IC.
 C. B/OP/RES
 D. PROBE/EL BEING DEVELOPED AS EVENTS UNFOLD, WILL P/UD ASAP.
 E. SUBSEQUENT REPORTS TO BE RELEASED UPON COMPLETION NEXT SAR EFFORT MILESTONES.

BT

(Image: Archives New Zealand)



Air New Zealand TE901 Mt Erebus, Antarctica 28 November 1979



After arriving in the vicinity of Ross Island the flight crew descended below the official MSA for the flight, as other sightseeing flights before them had done, attempting to provide the best view for passengers.

They did so in the probable belief that they were about 27 miles to the west of the mountain.

In fact, they were at 1,500 ft at 2,000 ft.

The navigation coordinates for the flight were incorrect. Unfortunately, the flight crew were

not aware of the error until they entered up McMurdo Sound, which was inconsistent with their briefing.

The aircraft was flying at an altitude of 12,448 ft Mt Erebus

at the time of the accident.

The flight crew were not aware of the coordinates.



(Erebus crash trail in snow. Image: © R B Thomson, Antarctica NZ Pictorial Collection)



FIGURE 4




(Fuselage of DC-10. Image © G Varcoe, Antarctica NZ Pictorial Collection)

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Air New Zealand TE901


Mt Erebus, Antarctica
28 November 1979



'Probable Cause':

"The decision of the captain to continue the flight at low level toward an area of poor surface and horizon definition when the crew was not certain of their position and the subsequently inability to detect the rising terrain which intercepted the aircraft's flight path."

NZ MoT Aircraft Accident Investigation Report
30 May 1980



A quick investigation is not necessarily a good investigation.
Under pressure: Intense political, shareholder, societal, media scrutiny

This view of the crash site, looking downhill through the wreckage of Air New Zealand Flight TE901 towards the Lewis Bay sea ice, shows a maze of body location flags. Photograph taken by Colin Monteath of the Antarctic Division in December 1979. (Image: Archives New Zealand)

Safety & Organisational Accountability

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Air New Zealand TE901

Mt Erebus, Antarctica
28 November 1979



Captain Gordon Vette:


At the time of the accident, he was a Flight Instructor and Check and Training Captain on the DC-10 at AirNZ

Former engineering apprentice

Former RNZAF Flying Instructor

Pilot with Air New Zealand since 1958

He became concerned at the speed with which the accident investigation seemed to be moving towards 'pilot error' as the cause.



Vette was convinced that the crew must have been misled by a visual illusion

He commenced research into visual illusions including the Whiteout phenomena

Consulted with world experts, including Professor Ross Day at Monash University, an expert in perception and visual illusions

Pressure from Vette and others led to the formation of a Royal Commission into the accident

(Image: The Vette Family)

Safety & Organisational Accountability

Air New Zealand TE901

Mt Erebus, Antarctica
28 November 1979



Captain Gordon Vette:

The accident was a consequence of:

- a). the crew's mindset after the route qualification briefing;*
- b). the unnotified change in navigation coordinates; and*
- c). the sector whiteout conditions
(on which they had not been adequately briefed);*

Evidence to the Royal Commission of Inquiry
July 1980

DC-10 wreckage: Koru in snow.
Image: © Antarctica NZ Pictorial Collection



(Memorial cross, Mt Erebus.
Image: Archives New Zealand)

Air New Zealand TE901

Mt Erebus, Antarctica
28 November 1979



Justice Peter Mahon:

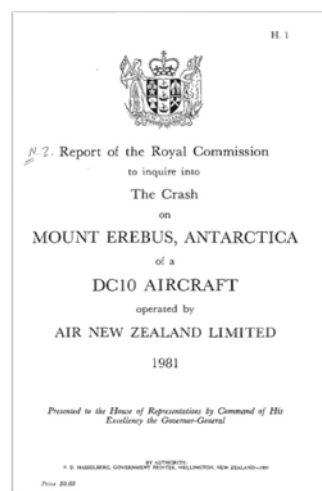
"The occurrence of any accident is normally due to the existence of a variety of factors." [In this case there were 10 factors]

"If any one of these 10 factors had not existed, then there would have been no disaster".

"... the single dominant and effective cause of the disaster was the mistake made by those airline officials who programmed the aircraft to fly directly at Mt Erebus and omitted to tell the aircrew.

That mistake is directly attributable, not so much to the persons who made it, but to the incompetent administrative airline procedures which made the mistake possible."

"In my opinion, neither Captain Collins nor First Officer Cassin nor the flight engineers made any error which contributed to the disaster, and were not responsible for its occurrence."



Report of the Royal Commission, April 1981

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Air New Zealand TE901

Mt Erebus, Antarctica
28 November 1979



Justice Peter Mahon:

"The airline witnesses who appeared before me were intent, as I have indicated before, upon establishing pilot error as the effective cause of the accident."

"...the palpably false sections of evidence which I heard could not have been the result of mistake, or faulty recollection. They originated, I am compelled to say, in a pre-determined plan of deception.

They were very clearly part of an attempt to conceal a series of disastrous administrative blunders and so ... I am forced reluctantly to say that I had to listen to *an orchestrated litany of lies.*"



Report of the Royal Commission of Inquiry
April 1981



An Organisational
Accident

Report of the Royal Commission, April 1981

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Another watershed accident: Embraer EMB-120 Brasilia In-flight Structural Break-up Eagle Lake, TX 11 Sept 1991



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Embraer EMB-120 In-flight Structural Break-up Eagle Lake, TX 11 Sept 1991



- Commercial flight from Laredo to Houston, TX.
- Flight distance of about 300 miles with a scheduled flight time of about 90 minutes
- Departed LRD at 09:09 am CDT
- The aircraft was on descent from FL240, passing through 11,500 ft at about 10:03 am CDT, when it experienced a sudden structural breakup and crashed in a cornfield near Eagle Lake, Texas.
- **14 fatalities**
(2 pilots, 1 cabin crew & 11 pax).



Image: NTSB

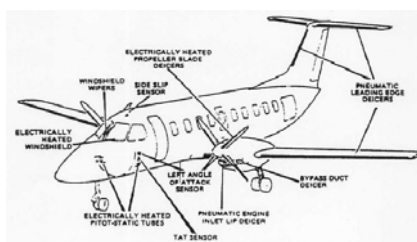
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Embraer EMB-120 In-flight Structural Break-up Eagle Lake, TX 11 Sept 1991



- Overnight maintenance was scheduled for the night before the accident, including removal and replacement of de-icing boots on the leading edge of the horizontal stabilizer.
- The work was conducted across two shifts. An inspector on the first shift, deciding to assist, removed the 47 screws from the upper surface of the right side of the horizontal stabiliser, then crawled over to the left side to do the same.
- After the shift change, the next supervisor decided that his crew would complete work on the right leading-edge assembly only, leaving work on the left side for a later date.
- No additional work was done on the left side of the stabiliser, with the second shift maintenance crew apparently unaware that the left side upper surface screws had been removed.
- During the accident investigation it was found that the 47 left side screws were missing from the aircraft wreckage, and no trace of the missing screws was ever found.



Safety & Organisational Accountability

NTSB Probable Cause



NTSB Final Report July 1992

- "The failure of Continental Express maintenance and inspection personnel to adhere to proper maintenance and quality assurance procedures for the airplane's horizontal stabilizer deice boots that led to the sudden in-flight loss of the partially secured left horizontal stabilizer leading edge and the immediate severe nose-down pitchover and breakup of the airplane.
- Contributing to the cause of the accident was the failure of Continental Express management to ensure compliance with the approved maintenance procedures, and the failure of FAA surveillance to detect and verify compliance with approved procedures."

John K. Lauber



- PhD in Neuropsychology (Ohio State University)
- US Navy Research Psychologist
- Chief of the Aeronautical Human Factors Research Office, NASA Ames
 - NASA/MAC CRM conferences 1979 & 1986
- Member, NTSB 1985-1994
 - Two terms, appointed by Presidents Reagan & Bush
- VP Safety & Compliance, Delta Airlines
- SVP and Chief Product Safety Officer, Airbus SAS, Toulouse



Images: JK Lauber



Systemic contributing factors

John K. Lauber filed a dissenting statement in the NTSB report:

- "I am perplexed by the majority decision [of the NTSB Board] that the actions of Continental Express senior management were not [determined to be] causal in this accident.
- The multitude of lapses and failures committed by many employees of Continental Express ... is not consistent with the notion that the accident resulted from isolated, as opposed to systemic, factors
- It is clear ... that the series of failures which led directly to the accident were not the result of an aberration, but rather resulted from the normal, accepted way of doing business at Continental Express. ...



- By permitting ... deviations to occur on a continuing basis, senior management created a work environment in which a string of failures, such as occurred the night before the accident, became probable."

John K. Lauber
Member, NTSB, 21 July 1992



Lauber's Probable Causes

Lauber believed the probable causes should read as follows:

"The National Transportation Safety Board determines that the probable causes of this accident were:

- 1) The failure of Continental Express management to establish a corporate culture which encouraged and enforced adherence to approved maintenance and quality assurance procedures, and
- 2) the consequent string of failures by Continental Express maintenance and inspection personnel to follow approved procedures for the replacement of the horizontal stabilizer deice boots.

Contributing to the accident was the inadequate surveillance by the FAA of the Continental Express maintenance and quality assurance programs."

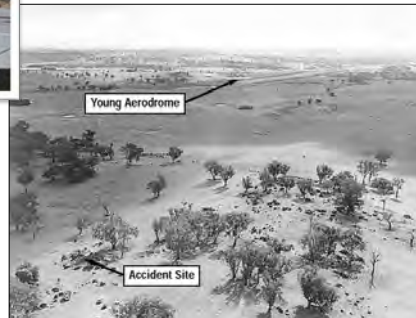
John K. Lauber
Member, NTSB, 21 July 1992

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Monarch Airlines
Piper PA31-350 Navajo Chieftain VH-NDU
CFIT at Young, NSW
11 June 1993



Monarch Airlines flight OB301
Departed SYD at 17:38 Friday evening
On arrival at NGA: Low cloud, very dark
Visual circling approach (3rd?)
Inoperative autopilot / HSI (Horizontal Situation Indicator)
The aircraft struck trees and crashed at about 19:18
Seven fatalities (2 flight crew, 5 pax)



- **BASI Report:**
 - *Organisational failures were identified relating to management of the airline by the company, and the regulation and licensing of its operations by the Civil Aviation Authority.*
- Bureau of Air Safety Investigation
July 1994*

Images: BASI

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Sinking of
HMNZS Manawanui
Samoa, 6 October 2024




Image: RNZ Navy


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Sinking of HMNZS Manawanui

Samoa, 6 October 2024



- HMNZS Manawanui was a dive and hydrographic vessel of the Royal New Zealand Navy (RNZN). It had previously served as a civilian survey vessel in the Norwegian oil and gas industry.
- The ship was purchased for the RNZN in 2018 and commissioned on 7 June 2019.
- HMNZS Manawanui entered operational service in early 2020 and undertook multiple deployments in the Pacific.
- HMNZS Manawanui sank on 6 OCT 2024 after running aground while surveying a reef off the coast of Samoa.
- All 75 people aboard were evacuated and rescued.




Images taken by Profile Boats, who were involved in rescuing crew of NZ Navy Ship HMNZS Manawanui. (Source: Profile Boats)

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Sinking of HMNZS Manawanui

Samoa, 6 October 2024

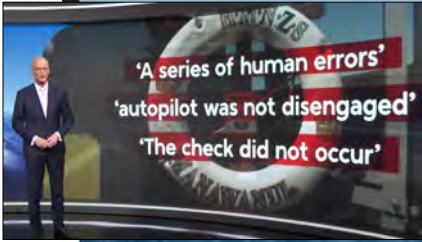


Navy: Human error caused Manawanui sinking, disciplinary process to follow

By News Reporters | November 29, 2024

The sinking of the HMNZS Manawanui off the coast of Samoa in October was the result of a "series of human errors", an interim Court of Inquiry report has found.

29 November 2024




In short:
Crew failed to disengage the autopilot and neglected proper manual control checks, leading to the grounding of HMNZS Manawanui.
All 75 aboard were evacuated safely.

What's next?
Disciplinary actions are underway as officials address training and operational flaws.


Images taken by Profile Boats, who were involved in rescuing crew of NZ Navy Ship HMNZS Manawanui. (Source: Profile Boats)

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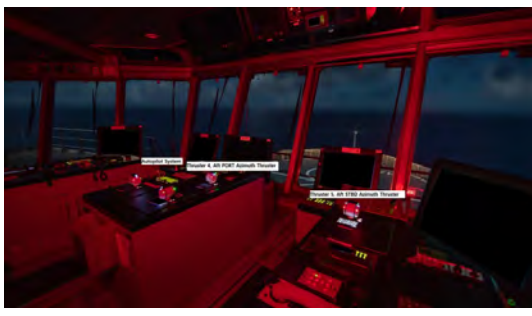


Sinking of HMNZS Manawanui

Interim Report, 29 November 2024




- “The direct cause of the grounding has been determined as **a series of human errors** which meant the ship’s autopilot was not disengaged when it should have been,” Rear Admiral Golding said.
- “The crew did not realise Manawanui remained in autopilot and ... mistakenly believed its failure to respond to direction changes was the result of a thruster control failure.
- “Having mistakenly assessed a thruster control failure, standard procedures **should have prompted ship’s crew to check** that the ship was under manual control rather than in autopilot. This check did not occur.”




(Image: NZ Defence Force)

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Sinking of HMNZS Manawanui

Final Report, 31 March 2025



COURT OF INQUIRY


assembled by

RADM Garin Golding, RNZN
Chief of Navy

For the purpose of collecting and recording evidence on the circumstances that resulted in the loss of HMNZS MANAWANUI off Upolu, Samoa, on 6 October 2024

Crew mistakes caused the sinking of a New Zealand navy ship off Samoan coast, inquiry finds

Disasters, Accidents and Emergency Incidents
Fri 29 Nov



The HMNZS Manawanui listing after it struck a reef in Samoa waters. (© Tom Isted)

Cause of the grounding

21. The direct cause of the grounding has been determined as a series of human errors in that the Ship was put on a heading towards land and the autopilot mode was not disengaged to enable the Ship to turn in an easterly direction. Remaining in autopilot resulted in the Ship maintaining a course of 340° toward land, until grounding and eventually stranding.


COI Final Report: 31 March 2025

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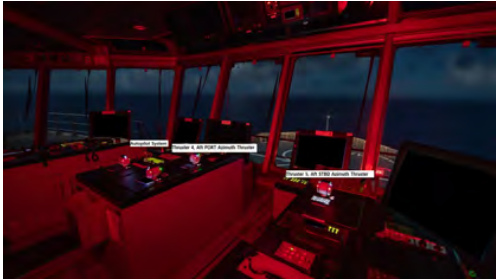
Sinking of HMNZS Manawanui

Final Report, 31 March 2025



Contributing Factors:

- Training and experience;
- Military hydrographic planning;
- Orders, Instructions and Procedures;
- Operational Risk Management;
- Force generation incomplete (for task);
- Operational release / seaworthiness;
- Supervision (understanding of task / SA);
- Violations (from extant OIPs);
- Haste (Time pressure);
- Leadership;
- Distraction/interruption; and
- Hollowness (personnel gaps).




(Image: NZ Defence Force)


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Accountability?



- Montague Street sentencing judge:
 - "why you were so grossly inattentive is unknown to me".*
 - "employers cannot be blamed for the obvious failings of employees".*
- Mt Erebus Chief Investigator:
 - "The decision of the captain to continue the flight ... when uncertain ... and subsequently inability to detect the rising terrain" (Pilot error)*
- Continental Express Management"
 - This accident happened "because of a failure on the part of the mechanics and inspectors who performed the work to adhere to approved procedures".*
- HMNZS Manawanui Interim Report:
 - "The direct cause of the grounding ... a series of human errors which meant the ship's autopilot was not disengaged when it should have been."*



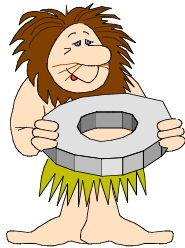
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Myth: People are the problem

Human error contribution to accidents estimated at between 70-100% for most well-defended, hazardous technologies



Hardly surprising since people

- Design
- Build
- Operate
- Maintain
- Manage
- Finance
- Regulate these systems...

Remember the 'flip-side'...

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Reality: Our people *create* safety




Safety & Organisational Accountability



Commercial Aviation Safety



- In 2024 the aviation industry successfully transported 5 billion passengers worldwide on over 40 million flights
- There was one fatal accident every 5.8 million flight sectors*
 - 40.6 million flights (~12% below 2019), 7 fatal hull loss accidents**, 251 fatalities
 - Overall accident rate = 1.13 per million flight sectors (5-year rolling avg rate = 1.25)
- To put this in perspective:
 - About 77 departures every minute
 - One fatal accident about every 52 days
 - 251 fatalities across five billion passenger journeys
 - Fatality risk = 0.06 per million sectors***



* Includes all commercial air transport ops (jet & turboprop)
 ** Most accidents were tail strikes or runway excursions


*** You would have to fly once every day for 49,246 years before experiencing a 100% fatal aircraft accident

Source:
 IATA Safety Overview, 61st Edition
 IATA Accident Classification Task Force, February 2025



Safety & Organisational Accountability



Our people (workers) create operational safety



- Front line workers contribute more to safety than any elaborate equipment or processes
 - **Creating safety every day:**
 - Managing / correcting / dealing with anomalies, ensuring that our system is both safe and effective (productive)
 - **Sometimes 'saving the day':**
 - QF32 / Hudson River / Gimli Glider / etc [but most of these stories go untold]
 - **When that doesn't happen / things do not go to plan, we need to find out why**
 - Systemic approach
 - Systematic processes
 - We will be telling a story: Must be evidence-based
 - So that we as an organisation / system can focus on control and prevention




Safety & Organisational Accountability

Jumperkine Rail Fatality

Collision between Freight Trains 7MP5 and 2K66
At Jumperkine, WA, 24 December 2019



The collision occurred at about 02:00 am on 24 December 2019.

7MP5 was a driver only operation travelling towards Perth in the same direction as 2K66 but about 28 km behind.

2K66 was stopped to allow a freight train travelling in the opposite direction to pass.

At about 01:56 7MP5 passed a signal set at **Caution** and three minutes later passed another signal set at **Stop** (Signal Passed at Danger ~ SPAD).

At that point 7MP5 was travelling at a speed of 72 km/h and was about 800 m from the rear of 2K66.

Emergency braking was applied about 175 m from the rear of 2K66, reducing the impact speed to 41 km/h, but too late to avoid a collision.

The driver of 7MP5 sustained fatal injuries.

Figure 5: Accident site, lead locomotive of 7MP5 and last wagon of 2K66 post collision



The image shows damage to rolling stock from train 7MP5 and last wagon on train 2K66 post collision. Source: Western Australia Police, annotated by the ATSB

Source: Australian Transport Safety Bureau

Jumperkine Rail Fatality

Jumperkine, WA, 24 December 2019



- The ATSB Investigation concluded:
 - The driver of 7MP5 was almost certainly unaware of the SPAD and did not commence emergency braking until it was too late to avoid a collision.
 - Evidence strongly indicated that the performance of the driver (of 7MP5) was adversely impaired by fatigue.
 - There were several factors related to PN's fatigue management processes that increased risk.
 - The PN safety system relied on a single driver correctly observing and responding to signals at all times, including during the WOCL [window of circadian low] (when fatigue risk is greatest).

ATSB

Source: Australian Transport Safety Bureau

- In December 2021, ONRSR (the national rail safety regulator) commenced prosecution of PN, laying four charges alleging that PN had contravened sections of *Rail Safety National Law* in relation to train crew fatigue risk management processes.





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Jumperkine Rail Fatality

Jumperkine, WA, 24 December 2019



- In May 2023, an Enforceable Voluntary Undertaking (EVU) was entered into by the train operator Pacific National (PN) and ONRSR.
- The EVU was developed an alternative to prosecution of PN for contravention of the *Rail Safety National Law*.
- PN agreed to six major rail safety enhancement commitments within the EVU:
 - 1) Human Factors / Fatigue Risk Management
 - 2) Physical Health and Wellbeing (Train drivers)
 - 3) Rail Industry Safety Conference
 - 4) Meeting with RIM (accredited rail infrastructure manager)
 - 5) Emerging Technology Trial (PN network)
 - 6) Emerging Technology Trial (UK RSSB)
- The purpose of the EVU is to address risks that ONRSR found were contributory
- The project has a 36-month timeline and is on schedule to be completed in May 2026
- Total cost of the project to Pacific National will exceed AUD \$3.1 million





Restorative justice in action?

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Thank you



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