



**Australian Government**

**Australian Transport Safety Bureau**

# Near miss with rail safety worker by trains 89-K and 88-C

Near Redfern, New South Wales, on 8 September 2018

**ATSB Transport Safety Report**

Rail Occurrence Investigation

RO-2018-021

Final – 30 June 2020

This investigation was conducted under the *Transport Safety Investigation Act 2003* (Commonwealth) by the Office of Transport Safety Investigations (NSW) on behalf of the Australian Transport Safety Bureau in accordance with the Collaboration Agreement.

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#### Addendum

Page	Change	Date

# Safety summary

## What happened

On 8 September 2018, a rail safety worker (RSW) was nearly struck by two trains within the airport tunnel, near Redfern, New South Wales. The RSW left their worksite in the Eastern Suburbs Railway (ESR) tunnel at Platform 11, Redfern, to find a toilet. In attempting to find a toilet, the RSW entered an adjacent worksite on the concourse level at Redfern Station. The RSW was then directed by a worker through the worksite and on to Lawson Street, Redfern. The RSW utilised the public toilets at the station but, was prevented from returning to his worksite due to the concourse level worksite. In attempting to return to the worksite, the RSW entered the danger zone at Platform 10, Redfern, before walking towards Central Station. On arriving at the entrance to the airport tunnel, the RSW mistakenly entered the tunnel in the belief he could return to his worksite.

While in the tunnel, the RSW reported hearing a train approaching, moved clear of the track and clung to the wall of the tunnel just before train 89-K passed his location. Train 89-K came to an emergency stop. After the near miss with 89-K, the RSW quickly exited the tunnel and crossed in the path of a second train 88-C near the mouth of the Up side of the tunnel. Following the near misses, the RSW returned to Redfern Station via the same path and exited the station by the stairs at the Erskineville end of Platform 10. The RSW located the maintenance entrance to the Eastern Suburbs Railway tunnel and completed this shift without reporting the incident until the afternoon.

## What the ATSB found

The ATSB found that the RSW had not been briefed on the concourse level worksite or the requirement to access Redfern Station from Marian Street before commencing work. The RSW entered Redfern Station from the Eastern Suburbs Railway tunnel without receiving or seeking a project site induction and left the protected area to find a toilet. The RSW attempted to return to his worksite believing he could locate the entrance from the city side of Redfern, and entered the airport tunnel, which was live at the time.

Following the near misses with 89-K and 88-C, the RSW returned to Redfern and entered the worksite undetected after locating the entrance off Marian Street. The RSW signed the project site induction record sheet, indicating he received an induction when he was not present.

## What's been done as a result

The rail safety worker was removed from safe working duties by Sydney Trains following this incident and placed on restricted duties.

Sydney Trains advised that they acknowledge the safety issue and will follow their business processes to address the safety issue. Additionally, they advised a number of briefings were conducted following the occurrence to communicate lessons learned with the workgroup.

## Safety message

This incident highlights the importance of planning and controlling worksites within the rail corridor, in particular, when working within tunnels and at platforms where access can be from multiple locations.

Workers must ensure that they receive the required safety briefing prior to undertaking work or entering a new work area, and seek further information if required prior to starting work. Workers are also advised to stop and find a safe place in the event they become lost or separated from their work group. Workers should also report incidents in a timely manner.

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# The occurrence

## What happened

On the morning of 8 September 2018, a project (Job No.336) to partially replace the railway sleepers within the Eastern Suburbs Railway (ESR) was being undertaken between 1.150 km<sup>1</sup> and 1.450 km at Redfern Platform 11. Assisting with this project were two groups of Signal Electricians providing support to the work group and protecting signalling equipment during the work.

At 0800,<sup>2</sup> a group of signal electricians consisting of a Signal Electrician (RSW)<sup>3</sup> and Team Leader (T/L) received a worksite protection pre-work briefing from the Protection Officer (PO) for the project. The brief was conducted near the hi-rail take off pad<sup>4</sup> located at 2.867 km near Erskineville. The section of track was within the protection of a Local Possession Authority (LPA)<sup>5</sup> between Bondi Junction and Hurstville.

Following the briefing, the RSW and T/L walked along the Illawarra Relief Up<sup>6</sup> within the ESR tunnel, suppressing train stops and checking signalling equipment along the way, before arriving at Redfern Platform 11. At 0840, the RSW left the worksite at Platform 11 and entered an adjacent worksite on the concourse level to find a toilet. This adjacent worksite was part of the Redfern Station entry upgrade at Lawson Street on the concourse level. A worker in the Redfern Station worksite directed the RSW through the area and on to Lawson Street. The RSW re-entered Redfern Station and utilised the public toilets at the station until 0856.

The RSW was unable to return to Platform 11 via the same path taken, due to the concourse level worksite. At approximately 0857, the RSW entered the danger zone at the city end of Redfern Platform 10 at 1.213 km. The RSW walked in an Up direction, attempting to locate the portal<sup>7</sup> of the ESR tunnel to return to the worksite. The RSW walked approximately 550 m along live track and access roads, before entering what they believed was the ESR portal. In fact, the RSW had entered the portal of the Airport Line (APL) tunnel at 0.626 km. The RSW walked in a Down direction in the tunnel believing that they could return to their worksite.

At 0906, train 89-K consisting of an eight-car Waratah departed Central, bound for Macarthur via the APL. Shortly after entering the APL tunnel, the driver of 89-K saw a person in high-visibility clothing in the Down four-foot<sup>8</sup> approximately 120 m inside the tunnel. The front-of-train closed circuit television (CCTV) footage from 89-K showed the RSW jumping clear of the track and clinging to the cable troughing on the tunnel wall, three seconds before the train passed at approximately 45 km/h. The driver of 89-K made an emergency brake application and the train came to a complete stop at 0907. The driver then reported a near miss to the area controller.

Following the near miss with 89-K, the RSW ran in an Up direction, between the wall of the tunnel and stationary train. On arriving at the rear car of 89-K, the RSW crossed the Down track and on to the Up track of the APL and in front of the approaching Up service 88-C. The driver of 88-C

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<sup>1</sup> The kilometre distance is measured from Platform 1, Central Station, Sydney, New South Wales.

<sup>2</sup> Times shown in 24 hour time as Australian Eastern Standard Time (AEST).

<sup>3</sup> The involved individual was a Signal Electrician and is referred to as the rail safety worker (RSW) for the remainder of this report.

<sup>4</sup> A hi-rail take off pad consists of a raised platform, to allow track vehicles to drive on to the track before lowering the rail wheels.

<sup>5</sup> See planning and protecting worksites in the rail corridor pg.5.

<sup>6</sup> The Up track refers to the direction of travel for trains heading towards Sydney, the Down track refers to trains heading away from Sydney.

<sup>7</sup> The portal refers to the entrance of a tunnel.

<sup>8</sup> See rail corridor pg.3.

made an emergency brake application and halted the train at 0908. The driver of 88-C also reported a near miss to the area controller.

The area controller began warning trains in the area of a possible trespasser as the identity of the person was unknown. Warnings to trains of trespassers ceased at 0933 after no further sightings were made.

At 0915, the RSW returned to Redfern Platform 10 and exited the country end of the platform via the stairs to Marian Street. The RSW then located an entrance to access the ESR through an old maintenance depot located off Marian Street.

The RSW completed the remainder of his rostered shift at 1500 without advising of the near misses. Following this, the RSW sought medical treatment for a hand injury. The RSW reportedly cut his hand when he slipped and fell in the four-foot, before jumping clear of train 89-K and onto the cable troughing.

At 1645, the RSW reported the incident to the Shift Manager (SM) at the Rail Management Centre (RMC). Post-incident drug and alcohol testing was not possible due to the late reporting of the incident. Additionally, the RSW was at home at the time of reporting.

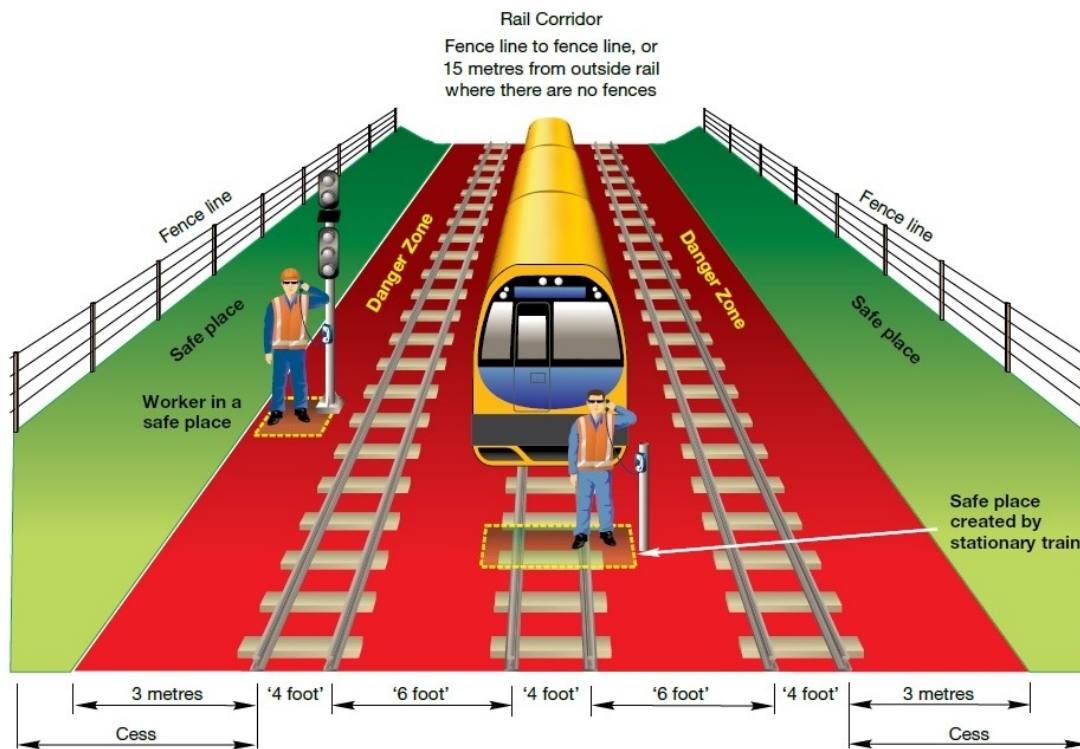
# Context

## Rail corridor

There are a number of terms used within the rail industry to describe the different areas within the rail corridor (Figure 1), these are:<sup>9</sup>

- Danger zone, any area within 3 m horizontally and either above or below this area, unless constantly in a safe place.
- Safe place, an area where a worker or their equipment cannot be struck by rail traffic. A safe place can be created within the danger zone, through the use of recognised protection arrangements.
- Four-foot (4 ft), the spacing between the two railway tracks is referred to as the 4ft based on the railway gauge of 4 ft 8.5" (1435mm).
- Six-foot (6 ft), the spacing between two sets of tracks.
- Cess, this is the area between the outer most rail and the fence line or 15 m in non-fenced areas.

**Figure 1: Rail corridor diagram**



The figure shows two workers within the danger zone using recognised protection arrangements to create a safe place.  
Source: Sydney Trains

<sup>9</sup> Rail Industry Safety Induction Handbook, Sydney Trains

## Incident locations

### **Redfern Station**

Redfern Station is located at 1.204 km and consists of twelve platforms, which service both Sydney Trains and NSW Trains services. Platforms 11 and 12 are the only underground platforms at Redfern, with these platforms forming part of the ESR.

At the time of the occurrence, Platforms 11 and 12 were closed to the public due to the partial re-sleepering project at Platform 11. Additionally, a project to redesign the station entrance on the corner of Gibbons and Lawson Street was underway. Barriers were erected near the top of the stairs and escalators to prevent access to this worksite from the ESR.

Access to Platform 11 and 12 was via a disused maintenance depot off Marian Street, Redfern. To access the toilets from the ESR, a worker needed to exit Platform 11 using the stairs and enter the office area of the disused maintenance depot. These toilets were the designated toilets for both worksites at Redfern.

### **Eastern Suburbs Railway**

The construction of the ESR was completed in 1979, with the railway running between Erskineville and Bondi Junction. This railway primarily consists of underground tunnels with some short sections of viaducts. There were a number of construction methods used during the construction the ESR tunnel, resulting in different tunnel profiles along the length of the tunnel.<sup>10</sup> Between Erskineville and Redfern, the tunnel was constructed using cut and cover technique,<sup>11</sup> giving this section a square shape. The remainder of the tunnel is a horseshoe arch-shaped and formed with drilling and blasting techniques.

The ESR tunnel begins north of Erskineville with the portal located at 2.634 km (Figure 2). At the entrance the Up and Down Illawarra Relief (IR) are located side by side with a dividing wall separating the two lines. There are refuges located along the length of the tunnel to provide workers with a safe place if required.

Redfern is the first station with Platforms 11 and 12 beginning at 1.409 km in the Up direction.

### **Airport Line**

The construction of the APL was completed in 2000, with the railway running between Central and Wolli Creek. The APL runs within a dual-line tunnel, between the portal entrance near Prince Alfred Park at 0.626 km (Figure 2) and Wolli Creek at 9.358 km. The tunnel was constructed using tunnel boring equipment producing a round tunnel. The Sydney Trains' *Worksite Protection Hazardous Locations Register (WPHLR)* listed the APL tunnel as not having dedicated safe places available in the tunnel. At the time of the occurrence, there was no worksite protection in place for the APL. Rail traffic could operate at the maximum track speed of 80 km/h through the tunnel.

<sup>10</sup> Transport for NSW, Asset Standards Authority, Development near rail tunnels, T HR CI 12051

<sup>11</sup> Cut and cover is a method of excavating earth to form a tunnel and then covering the formed tunnel after the tunnel section has been constructed.



**Figure 2: Eastern Suburbs Railway and Airport Line Tunnels**



This map shows the underground path of the Eastern Suburbs Railway tunnel in orange and Airport Line tunnel in white. Source: Google Earth, annotated by OTSI

## Planning and protecting worksites in the rail corridor

Prior to conducting work within the rail corridor, the safety risks are to be assessed to determine the level of safeworking protection required. This is set out in Network Rule *NWT 300 Planning work in the Rail Corridor*. The preferred methods for worksite protection when working on track are Local Possession Authority or Track Occupancy Authorities (TOA).

Included within *NWT300* was a requirement to conduct a safety assessment including safe access to and from the worksite. The PO must also brief workers about the worksite protection and safety controls prior to workers commencing work.

The concourse level worksite was within the rail corridor but did not encroach on the danger zone. Therefore, this worksite did not need assessment in accordance with *NWT300*. Barriers were erected around the tiling worksite to prevent unauthorised access to the area.

### **Local possession authority**

Network Rule *NWT 302 Local Possession Authority* details the rules for authorising, issuing and using an LPA. An LPA allows for the closure of a section/s of track for a period of time allowing for a single worksite or multiple worksites within the limits of an LPA.

Network Procedure *NPR 700 Using a Local Possession Authority*, defines the process for implementing and protecting an LPA. Red flags and red lights are used as a visual means of delineating the protected area of the LPA. The delineation flags and lights are to be placed in the four-foot.

### **Track possession planning**

Planning of track possessions is completed in accordance with Sydney Trains' process and procedures. Prior to conducting track possessions, pre-possession meetings are held in accordance with *Assets Scheduling & Delivery Coordination Pre-Possession Meeting Procedure*

(*AS&DC Pre-Possession Meeting Procedure*) and *Network Access Manual Volume 2 – Resource Scheduling & Coordination in Possessions (NAMV2)*. These procedures detail the required attendance at the pre-possession meeting and the responsibility for cascading this information to staff at their pre-work briefings. These procedures also detail the necessary information to be presented and confirmed during the pre-possession meeting, including:

- Possession limits and interfaces.
- Any interfaces with other possessions or other project works (including external companies and authorities).
- Hazards as identified through the risk mitigation plan (adjacent worksites).

The AS&DC Pre-Possession Meeting Procedure additionally specifies that:

Sydney Trains or contractor company representatives at the Prepossession Meeting (e.g. Construction Managers, Worksite Supervisors, Safe Working service providers) who are responsible for inducting workers after the Pre-possession Meeting must:

Not permit any person to work on their site/project unless that person has received an appropriate level of induction and a site-specific Pre-Work Briefing.

Possession briefing notes are developed through the planning phase to provide details of the track possession for distribution. The possession briefing notes relevant to this project<sup>12</sup> specified the following in relation to possession protocols and responsibilities:

A qualified and accountable representative from each worksite must attend the pre possession meeting and make sure that all relevant details are correct and included in the specific worksite briefing.

It is the responsibility of persons representing worksites to cascade the pre possession briefing details to other staff who will carry out safeworking duties during the possession for the jobs that they are representing.

### ***Project site induction briefing***

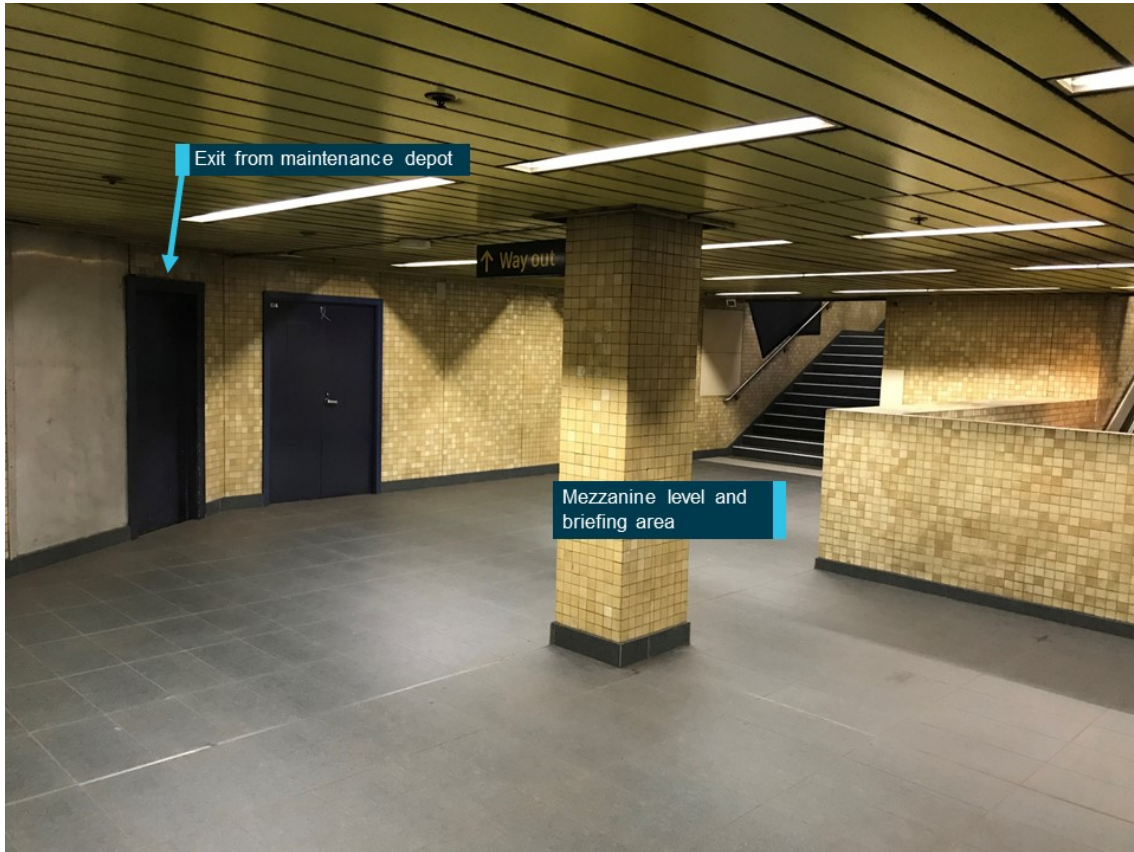
Workers were required to undertake a specific project site induction briefing prior to conducting work within the worksite at Redfern. This project site induction provided the project scope and detailed the hazards and risk controls for the project, and was separate to the worksite protection brief for the LPA. The project site induction was delivered on the mezzanine level at Redfern; this level is only accessible via the stairs from the platform or via the disused maintenance depot (Figure 3 and Figure 4). All workers entering the worksite from Marian Street walked past this location before accessing the platform level.

The location of the amenities were listed within the brief as 'Toilets are located at the station', but provided no details on how to access this location.

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<sup>12</sup> Sydney Trains', Possession Briefing Notes – Weekend 10, Config: ESR & Illawarras

**Figure 3: Mezzanine level and briefing area**



Source: OTSI

### Rail safety worker

The RSW was performing the role of a Signal Electrician on the day of the occurrence. This individual had approximately 13 years' experience working within the rail industry. They held the required qualifications for working on signalling equipment and working within the rail corridor.

The RSW additionally held the qualification of a Protection Officer Level 1 (PO1), this qualification allowed the worker to perform the following tasks:<sup>13</sup>

- assess risk associated with work within the rail corridor
- identify the level of protection required
- implement lookout working and ASB methods of worksite protection, and
- act as a lookout in the rail corridor.

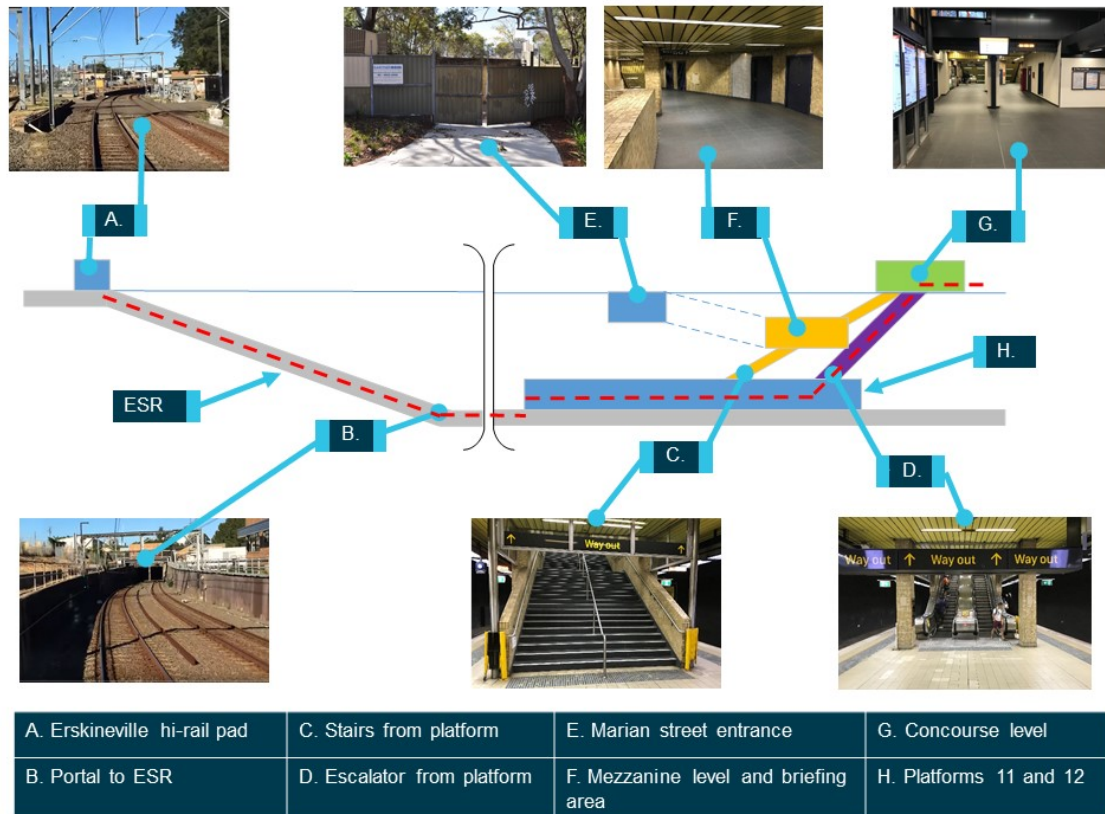
### ***Path taken by the rail safety worker***

The RSW received a worksite protection brief near Erskineville, before walking to Redfern Platform 11 within the ESR. On arriving at the worksite at Redfern, the RSW left the platform to find a toilet on the concourse exiting the worksite at Redfern via the escalator (Figure 4).

<sup>13</sup> Sydney Trains', Network Rules and Network Procedures Certification Standard V5.0



Figure 4: Path taken by the RSW between Erskineville and Redfern



This diagram depicts a side sectional view allowing areas both above and below ground to be seen. The red dotted line depicts the path of the RSW.  
Source: OTSI

After using the public toilet at Redfern Station, the RSW entered the danger zone at the city side of Platform 10 (Figure 5) before entering the APL tunnel.

Following the near misses, the RSW returned to Platform 10, exiting via the stairs before locating the entrance off Marian Street and returning to the worksite (Figure 6).

Figure 5: Path taken by the RSW from Redfern to entering the Airport Tunnel



Source: Google Maps and OTSI, annotated by OTSI

Figure 6: Path taken by the RSW from the Airport Tunnel to return to the ESR worksite



Source: Google Maps and OTSI, annotated by OTSI



# Safety analysis

## Worksite protection

The RSW received a worksite protection pre-work brief at 0800, near the hi-rail take off pad at Erskineville. The briefing was delivered by the PO for Job No. 336. This PO held the qualification as a PO2.<sup>14</sup> The worksite protection plan clearly detailed the limits of the LPA and areas of live track were shown on a map.

The worksite protection pre-work briefing listed the participant acknowledgements (Figure 7). In signing this briefing, workers acknowledge that the items shown within the briefing are accepted and have been explained.

At the time the RSW and T/L were briefed at Erskineville, there were three other workers briefed. These workers signed this worksite protection pre-work briefing, but there was no record of these workers signing the project site induction as required for entering the worksite. It was not able to be determined if these workers were advised of the requirement to undertake a project site induction on arrival to Redfern as part of this brief.

A review of the worksite protection pre-work briefing and project site induction briefing showed that between 0200 and 0925 hours, a total of 30 workers signed on to the worksite protection pre-work briefing. Of these 30 workers, only 21 workers signed the project site induction for the worksite at Redfern.

The participant acknowledgement also stated:

have been briefed on the hazards of adjoining worksites/processes

At interview, the RSW reported not being advised of the concourse level worksite and stated that he was unaware of the location of the toilets.

**Figure 7: Worksite protection pre-work briefing - Participant Acknowledgement**

**Participant Acknowledgement**

All incidents and injuries must be reported to the Site Supervisor (Line Manager) and the Safety Incident and Injury Hotline on 1800 772 779

NOTE: Recipients of the briefing are to question the Briefer if they don't understand any part of this briefing.  
 Mark each check box below with a tick  if the item applies or a cross  if the item does not apply

All persons listed below acknowledge that they:

<input checked="" type="checkbox"/> have been inducted to the site	<input checked="" type="checkbox"/> have been instructed in the controls recorded in this document and SWMS/SWIs [redacted]
<input checked="" type="checkbox"/> are free from the effects of alcohol/drugs/fatigue	<input checked="" type="checkbox"/> have been made aware of any hazardous materials/substances on-site [redacted]
<input checked="" type="checkbox"/> hold the applicable and current Rail Safety Worker Authorisation, trade licence and/or induction record e.g. Construction Industry Induction	<input checked="" type="checkbox"/> have been briefed on Material Safety Data Sheets (MSDS) [redacted]
<input checked="" type="checkbox"/> wear the appropriate Personal Protective Equipment (PPE)	<input checked="" type="checkbox"/> have been briefed on the site specific safety management plan [redacted]
<input checked="" type="checkbox"/> have been briefed on the contents of the Worksite Protection Plan	<input checked="" type="checkbox"/> have been briefed on the hazards of adjoining worksites/processes
<input checked="" type="checkbox"/> have been informed of the requirements of the electrical permit (if required)	<input checked="" type="checkbox"/> have been briefed about any new hazards and controls identified during the final site inspection (final site inspection must be conducted immediately before commencing work)
<input checked="" type="checkbox"/> have been briefed on the SWMS/SWIs/ documented safe work practice for the job [redacted]	

Source: Sydney Trains, redacted by OTSI

The hazards and controls for the worksite between 1.150 km and 1.450 km were included in the briefing (Figure 8). The hazards and controls assessed did not list the adjacent worksite on the concourse level or the control of entering via Marian Street, due to the concourse level worksite. The RSW received the worksite protection pre-work briefing almost 1.5 km away from Redfern. If the RSW was advised, it is not clear how effectively this information could be conveyed to a worker entering via the tunnel.

<sup>14</sup> Protection Officer Level 2 can manage an individual worksite within a TOA or LPA. Sydney Trains', Network Rules and Network Procedures Certification Standard V8.5.

The concourse level worksite in itself was not within the rail corridor and would not normally be considered an adjacent worksite. This worksite did, however, affect the potential access and egress to the ESR and should have been considered.

**Figure 8: Worksite protection pre-work briefing – Hazards and Controls**

Briefing date: 8 / 9 / 2018

**Protection Officer Details**

Name: [Redacted] Signature: [Redacted] Contact No.: [Redacted]

Work location: Partial Illawarra Relief up between 1+150km and 1+450km

Scope of work: Partial resleepering (1 in 4 pattern) through Redfern platform 11

Worksite protection (cross out not applicable):  LPA  TGA  TWA  ASB  Lockout Working Refer to Worksite Protection Plan for details

Hazards (e.g. Site specific hazards identified, including physical environment, human errors, plant and equipment)	Controls (to be implemented to eliminate or reduce the risk to the lowest practicable level)	Person responsible for Control
STRUCK BY RAIL TRAFFIC/ NEAR MISS	Workers to follow P.O.s instructions AT ALL TIMES + LPA	P.O
ELECTROCUTION/ OHW	ELECTRICAL SAUS to be maintained AT ALL TIMES. Treat all as live unless signed onto a permit	Permit Holder
JOB/ TASK SPECIFIC HAZARDS	Refer to SWMS and Supervisors brief	Supervisor
INCIDENTS DURING TASK	MUST BE REPORTED ASAP (as soon as practicable)	Supervisor/ P.O
MOBILE PHONES	To be used in a SAFE PLACE ONLY Don't walk and talk	ALL STAFF

Source: Sydney Trains, redacted by OTSI

The location of the briefing was delivered within the limits of the LPA, however there was no specific details for the RSW and T/L conducting work between the hi-rail take off pad at 2.867 km and Redfern Station.

The project site induction briefing also lists an acknowledgement section similar to that in the worksite protection pre-work briefing (Figure 9). Of note, both briefings list 'have been briefed on the contents of the Worksite Protection Plan'. When the two briefing attendance sheets are compared, there are a large number of workers who signed the briefing almost two hours prior to receiving the worksite protection pre-work briefing. This may present a situation where workers commence work without receiving all required briefings, specifically the Worksite Protection Plan.

**Figure 9: Project Site Induction Briefing Participant Acknowledgement**

**All incidents and injuries must be reported to the site supervisor (Line Manager) and the Safety Incident and Injury Hotline on 1800 772 779**

All persons listed below acknowledge that they: *(Briefers to delete and initial any items that are not applicable)* **NOTE: Persons are to question the Briefer if they don't understand any part of this briefing**

<input checked="" type="checkbox"/> have been inducted to the site	<input checked="" type="checkbox"/> have been briefed on the SWMS/SWIs/ documented safe work practice for the job
<input checked="" type="checkbox"/> hold the applicable and current certificates of competency, trade licence and/or induction record eg. Construction Industry Induction	<input checked="" type="checkbox"/> have been instructed in the controls recorded in this document and SWMS/SWIs
<input checked="" type="checkbox"/> wear the appropriate Personal Protective Equipment (PPE)	<input checked="" type="checkbox"/> are free from the effects of alcohol/drugs/fatigue
<input checked="" type="checkbox"/> have been briefed on the contents of the Worksite Protection Plan for work within the Rail Corridor	<input checked="" type="checkbox"/> have been made aware of any hazardous materials/substances on site
<input checked="" type="checkbox"/> have been informed of the requirements of the electrical permit (if required)	<input checked="" type="checkbox"/> have been briefed on Safety Data Sheets (SDS)
	<input checked="" type="checkbox"/> have been briefed on the site specific safety management plan
	<input checked="" type="checkbox"/> have been briefed on the hazards of adjoining worksites/processes

Source: Sydney Trains

Review of the PO's diary notes showed a number of briefings being completed with a separate task then being completed shortly afterwards. The short space of time between the PO delivering a briefing and the start of a subsequent task carried out by the PO probably reduced the effectiveness of the briefings.

At 0410, the PO for Job No.336 received a briefing with the PO coordinating the combined worksite Zone B (the LPA covered multiple areas and this section was within Zone B of the possession). The diary notes for the PO coordinating the combined worksite noted this briefing

contained information for 'all hazards and controls to be implemented and CWS (combined worksite coordinator) B protection details'.

At 0412, the PO for Job No.336 replaced delineation flags and red lights between 1.190 km and 1.430 km on the Up Illawarra relief line.

At 0415, the PO for Job No.336 provided a worksite protection pre-work brief to 17 workers.

At 0416, the PO notes 'Work started on Up Illawarra relief Platform 11 Redfern Station'.

## Access and egress

The concourse level worksite at Redfern Station required workers accessing the ESR to enter the station via Marian Street. On entering the disused maintenance depot, facilities including a meal room, and toilets were available for the workers associated with the project works.

A briefing area had been set up on the mezzanine level opposite the door leading from the maintenance depot in to the station mezzanine level (Figure 3). The location of this briefing area suggests consideration was given to ensure that all workers entering from Marian Street would receive a project site induction.

While there was consideration for workers entering via Marian Street, there did not appear to have been consideration given to workers entering the worksite from the ESR. The RSW and T/L entered the project worksite from the ESR without receiving a project site induction or being detected as such.

The briefing area on the mezzanine level was not continually monitored to ensure that all new workers entering via from Marian Street were detected and briefed. When the RSW returned to Redfern after 0915, they were able to enter the worksite undetected. The RSW then signed the project site induction briefing attendance sheet as receiving a brief at 0900.

The T/L did not sign the project site induction attendance sheet, however it could not be confirmed if the T/L did receive a brief while the RSW was absent or not. In either case, at least two workers entered the project site undetected and without receiving a project site induction.

The barricades erected for the concourse level worksite did not prevent the RSW from entering the adjacent worksite, allowing the worker to leave the protection of the LPA.

## Pre-possession planning

Sydney Trains advised that it was the responsibility of the worksite supervisor for Job No.336 for cascading the information from the pre-possession planning meetings.

The project owner requested support from the Signals Support Manager (SSM) through a resource request sheet (Figure 10). This request was for signals staff to attend site visits and a whiteboard meeting for the project.



Figure 10: Resource Request Sheet

RESOURCE REQUEST SHEET - Site Visits and Whiteboard Meeting					
Week of Project Works		WE10	Sat 08/09/2018	Sun 09/09/2018	
Work Location		Redfern Platform #11			
Project ID and Title		P.0027501 - Redfern - Town Hall Polymer Blocks			
Project Engineer		[REDACTED]			
Site Manager		TBC			
<b>Scope of Work</b> Install 150 Polymer Half Blocks (1 in 4) on the Up Illawarra Relief through Redfern Platform #11. Track Access will be from the Erskineville access ramp.					
DISCIPLINE	SKILL SET	DATE	ON SITE TIMES		COMMENTS
			Start	End	
Signals	Site Manager	21/06/2018	0900	1200	T-12 Week: Initial Site Visit (Thursday). For those written to the left, please invite whoever else you deem necessary.
Signals	Site Manager	12/07/2018	0900	1200	T-09 Week: Confirmation Site Visit (Thursday). For those written to the left, please invite whoever else you deem necessary.
Signals	Site Manager	30/08/2018	1300	1430	T-02 Week: Whiteboard Meeting (Thursday). For those written to the left, please invite whoever else you deem necessary.
OHW (Pan Check)	Project Support Engineer	30/08/2018	1300	1430	NOTE: Where there is a clash, insufficient time or unavoidable change required, the Project Engineer will inform all attendees of change of date/time of the Whiteboard Meeting.
Requested By: [REDACTED] (Program Manager) - [REDACTED]					

Source: Sydney Trains, redacted by OTSI

Sydney Trains' investigation reported that:

The signals support manager reported not receiving any documentation relating to job 336. Neither the signals support manager or team leader attended a site walk through completed one week prior to the possession.

Sydney Trains advised the ATSB that while safeworking is planned in accordance with their procedures and the project planning is carried out through other processes, it is not uncommon for safeworking issues to be raised at the project planning meetings. The project planning process incorporates whiteboard meetings to enable stakeholders to collect and share information.

At interview, it was reported that the whiteboard meetings are typically held prior to the commencement of planned work and all aspects of the project are discussed. From the evidence available, the whiteboard meeting for this project did occur, however the signal support team did not attend the meeting or site visits prior to the possession.

The AS&DC Pre-Possession Meeting Procedure and NAVM2 requires the pre-possession planning information to be communicated to all persons undertaking rail safety work. The whiteboard meeting was used as the method to conveying the pre-possession planning information to the relevant stakeholders. Sydney Trains do not have a process to hold a whiteboard meeting prior to commencing planned maintenance and to ensure that all workers received the required information.

Sydney Trains reported that staff working on Job No.336 were advised in the week prior of the requirement to access Platform 11 via Marian Street. The ATSB was told this advice was communicated verbally and in text, however no evidence of this was presented.

The Sydney Trains' investigation stated that the T/L was advised of the requirement to access Platform 11 via Marian Street, during a phone call at 0509 on the morning of 8 September 2019. This was disputed by the T/L, who reported they did not receive this information until arriving at Platform 11 and after the RSW had left. If the T/L was advised of this information earlier, this was not then communicated to the RSW.

### Decisions and actions of the rail safety worker

Following the briefing at Erskineville, the RSW walked with his T/L from this location through the ESR tunnel towards Redfern Platform 11. On arriving at Redfern, the RSW and T/L entered the project worksite without receiving or seeking a project site induction.

Sydney Trains reported that the RSW asked the T/L the location of the toilet, which was not known to either worker. Further, they stated the RSW had previously worked at Redfern, Platform

1 and reportedly knew the location of the public toilets on the concourse. At interview, the RSW advised the ATSB that he did not know the location of the toilets. It was not able to be determined if the RSW did or did not know the location of the toilets on the concourse. If the RSW was aware, this may have led the RSW to leave the platform via the escalator as the most direct route.

Leaving the platform via the escalator meant the RSW missed the location of the project site induction area and amenities on the mezzanine level. The RSW then pushed past barricades erected for the tiling worksite.

Review of the available CCTV footage shows the RSW enter the concourse level worksite, before being directed through the worksite on to Lawson Street. At interview, the RSW reported a person within the tiling worksite advised that they could not return via their worksite and advised that access to the ESR needed to be from the platform outside.

The RSW reported thinking that he could find a tunnel portal at the city end to return to his worksite. After using the public toilets located on the concourse at Redfern, the RSW walked towards Platform 10 and entered the danger zone at the city end of the platform. Around the time the RSW entered the danger zone at Redfern Platform 10, there were two other work groups in the area. The RSW reported seeing workers on the access road and possibly associated the workers as being involved with the same project, but did not ask these workers for assistance. The access road is not visible from the end of Platform 10 and would only be visible to the RSW after already entering the danger zone. The RSW continued walking before mistakenly entering the portal of the APL tunnel and not the ESR as he thought.

The RSW had worked across different parts of the rail network in approximately 13 years of working with Sydney Trains, including Platform 1, Redfern. Once the RSW was outside the protection of the LPA, he needed to make cognitive decisions in an effort to return to his worksite. While the RSW was qualified and experienced, in this instance, the RSW did not identify he was not where he thought he was. It is possible that the RSW's plan of returning to his worksite, lead to cognitive fixation, also referred to as plan continuation. Plan continuation refers to the idea, that an original plan is developed, which initially appears correct, with the person being locked into their plan. As the plan progresses, the individual may overlook or disregard cues indicating their plan should be altered or abandoned (Dekker, 2011).

The RSW reported that he had not worked in the ESR between Erskineville and Redfern prior to this occurrence, but had worked in the ESR between Woolloomooloo and Bondi Junction. The RSW stated he had never worked in the APL. The shape of the ESR tunnel varies along the length of the tunnel as a result of different construction methods used throughout the tunnel. It is possible that the RSW did not identify the differences between the two tunnels when entering the APL tunnel. This may be a result of the worker's fixation in attempting to return to his worksite.

There are a number of symptoms that can indicate the presence of fatigue, such as increased anxiety, decreased short-term memory, slowed reaction time, decreased work efficiency, reduced motivational drive, decreased vigilance, increased variability in work performance and increased errors of omission (Battelle Memorial Institute, 1998).

Work-related fatigue was assessed and was not considered to have contributed to the RSW's actions. However, the RSW may have been experiencing some level of non-work related fatigue. The RSW commenced an overtime shift at 0500 on the day of the occurrence, this was the RSW's third consecutive shift with the two previous shifts commencing at 0600. The RSW reported poor sleep the night prior due to a medical condition in the family. Additionally, he reported some broken sleep in the nights previous as well. This was not reported by the RSW when commencing work, as required by Sydney Trains' fatigue management processes.

When considering the actions of the RSW, some actions resulted in increased risk but do not appear to be that of a person experiencing moderate fatigue, such as:

- After entering the danger zone from Platform 10, they quickly moved to a safer area to walk along the cess within the rail corridor.
- The distance walked by the RSW in attempting to return to their worksite does not indicate a reduction in motivational drive.
- The RSW was quick to detect and respond to the approaching train. This does not indicate a reduction in reaction time or decreased vigilance.
- Following the near miss, the RSW returned to Platform 10 via the same path taken.

On returning to the worksite, the RSW signed the project site induction indicating that the induction was received at 0900. The RSW was not present at this time and the time signed was incorrect. The RSW did not advise of the near miss incidents until after the completion of his rostered shift and after seeking medical attention for a cut hand.

Due to the late reporting, drug and alcohol testing could not be carried out. The RSW advised the ATSB they had not taken any medication or illicit substance prior to the incident. When the RSW reported the incident by telephone, he stated on a number of occasions he had been scared. It was not possible to determine why the RSW did not report the incident at the time, as required by Sydney Trains.

## Findings

From the evidence available, the following findings are made with respect to the near misses involving the RSW and trains 89-K and 88-C that occurred near Redfern, New South Wales on 8 September 2018. These findings should not be read as apportioning blame or liability to any particular organisation or individual.

**Safety issues, or system problems, are highlighted in bold to emphasise their importance.**

A safety issue is an event or condition that increases safety risk and (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operating environment at a specific point in time.

### Contributing factors

- The RSW entered Redfern Station via the ESR without receiving or seeking a project site induction. The RSW then left the worksite to find a toilet.
- The RSW attempted to return to the worksite after using the bathroom at Redfern, but did not seek assistance before entering the danger zone at Redfern Platform 10 or when sighting other workers on the access road.
- The RSW entered the APL tunnel and not the ESR as intended and was nearly struck by trains 89-K and 88-C while in the APL tunnel.
- The RSW was advised of the limit of the local area possession and knowingly entered the danger zone without any form of protection.
- **Sydney Trains' control of the access and egress to the project worksite did not ensure that all workers entering the worksite were identified and received an induction.**  
[Safety issue]
- Sydney Trains' processes for cascading possession planning information did not ensure that all workers knew how to access the project worksite or the location of the site safety inductions.

## Safety issues and actions

The safety issues identified during this investigation are listed in the Findings and Safety issues and actions sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal safety recommendations or safety advisory notices.

Depending on the level of risk of the safety issue, the extent of corrective action taken by the relevant organisation, or the desirability of directing a broad safety message to the [aviation, marine, rail - as applicable] industry, the ATSB may issue safety recommendations or safety advisory notices as part of the final report.

All of the directly involved parties were provided with a draft report and invited to provide submissions. As part of that process, each organisation was asked to communicate what safety actions, if any, they had carried out or were planning to carry out in relation to each safety issue relevant to their organisation.

The initial public version of these safety issues and actions are provided separately on the ATSB website to facilitate monitoring by interested parties. Where relevant the safety issues and actions will be updated on the ATSB website as information comes to hand.

### Sydney Trains' Control of worksite access and egress

<b>Safety issue number:</b>	RO-2018-021-SI-01
<b>Safety issue owner:</b>	Sydney Trains
<b>Operation affected:</b>	Rail infrastructure maintenance
<b>Who it affects:</b>	All rail infrastructure managers

#### ***Safety issue description***

Sydney Trains' control of the access and egress to the project worksite did not ensure that all workers entering the worksite were identified and received an induction.

#### ***Proactive safety action***

<b>Action taken by:</b>	Sydney Trains
<b>Action number:</b>	RO-2018-021-NSA-027
<b>Action type:</b>	Proactive safety action
<b>Action status:</b>	Released

***Safety action taken:*** Sydney Trains advised they have acknowledge the safety issue and will follow their business management processes to address the safety issue.

***ATSB comment:*** The ATSB will monitor the actions taken by Sydney Trains to address the safety issue.

#### ***Status of the safety issue***

<b>Issue status:</b>	Safety action pending
<b>Justification:</b>	Pending operator action

### Sydney Trains proactive safety action

Sydney Trains notified that the following proactive safety actions had been taken:

- Signals support team were briefed on the incident and review of route knowledge for the City Underground and the ESR Line was included. Participants were also expressly advised that if they were unsure regarding working on these lines, they were to speak with their Work Group Leader or Team Leader to be familiar with the line prior to working on them.
- Team briefings including lessons learned from the incident and reminders to Project Owners to conduct thorough risk assessments so that all site specific hazards are identified and adequate controls implemented. Project Owners were also reminded of the need to communicate changes affecting worksites in a timely manner and to all stakeholders.

# General details

## Occurrence details

Date and time:	08 September 2018 – 0907 AEST	
Occurrence category:	Incident	
Primary occurrence type:	Near miss with worker	
Location:	Sydney Airport Tunnel	
	Latitude: 33° 53.331' S	Longitude: 151° 12.174' E

## Train details

Train operator:	Sydney Trains	
Registration:	89-K	
Type of operation:	Passenger	
Departure:	Circular Quay	
Destination:	Macarthur	
Persons on board:	Crew – 2	Passengers – Unknown
Injuries:	Crew – 0	Passengers – 0
Damage:	None	

Train operator:	Sydney Trains	
Registration:	88-C	
Type of operation:	Passenger	
Departure:	Unknown	
Destination:	Central	
Persons on board:	Crew – 2	Passengers – Unknown
Injuries:	Crew – 0	Passengers – 0
Damage:	None	

# Sources and submissions

## Sources of information

The sources of information during the investigation included the:

- Rail Safety Worker
- Sydney Trains.

## References

Battelle Memorial Institute (1998). *An Overview of the scientific literature concerning fatigue, sleep, and the circadian cycle*. Report prepared for the Office of the Chief Scientific and Technical Advisor for Human Factors, United States Federal Aviation Administration.

Dekker, S. (2011). *Patient safety*. New York: CR Press, pp.65-69.

Sydney Trains (2016). Assets Scheduling & Delivery Coordination Pre-Possession Meeting Procedure, v1.1.

Sydney Trains (2016). *Rail Industry Safety Induction Handbook*, v5.1.

Sydney Trains (2017). Network Access Manual Volume 2 – Resource Scheduling & Coordination in Possessions, v4.2.

Sydney Trains (2018). *Network Rules and Network Procedures Certification Standard*, v8.5.

Sydney Trains (2018). NPR 700 Using a Local Possession Authority, v7.1.

Sydney Trains (2018). NWT 300 Planning work in the Rail Corridor, v8.1.

Sydney Trains (2018). NWT 302 Local Possession Authority, v8.1.

Sydney Trains (2019). Worksite Protection Hazardous Locations Register, v21

Transport NSW, Asset Standards Authority (2018). *Development Near Rail Tunnels*, v2. Available at: <https://www.transport.nsw.gov.au/industry/asset-standards-authority/find-a-standard/development-near-rail-tunnels-2>

## 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 Sydney Trains, the involved worker, Office of National Rail Safety Regulator (ONRSR) and Transport for NSW (TfNSW).

Any submissions from those parties will be reviewed and where considered appropriate, the text of the draft report will be amended accordingly.

Submissions were received from Sydney Trains and the Office of National Rail Safety Regulator. The submissions were reviewed and, where considered appropriate, the text of the report was amended accordingly.



# Australian Transport Safety Bureau

The 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 the ATSB's 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 operations involving the travelling public.

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.

## Terminology used in this report

**Occurrence:** accident or incident.

**Safety factor:** an event or condition that increases safety risk. In other words, it is something that, if it occurred in the future, would increase the likelihood of an occurrence, and/or the severity of the adverse consequences associated with an occurrence. Safety factors include the occurrence events (e.g. engine failure, signal passed at danger, grounding), individual actions (e.g. errors and violations), local conditions, current risk controls and organisational influences.

**Contributing factor:** a factor that, had it not occurred or existed at the time of an occurrence, then either:

- (a) the occurrence would probably not have occurred; or
- (b) the adverse consequences associated with the occurrence would probably not have occurred or have been as serious, or
- (c) another contributing factor would probably not have occurred or existed.

**Other factors that increased risk:** a safety factor identified during an occurrence investigation, which did not meet the definition of contributing factor but was still considered to be important to communicate in an investigation report in the interest of improved transport safety.

**Other findings:** any finding, other than that associated with safety factors, considered important to include in an investigation report. Such findings may resolve ambiguity or controversy, describe possible scenarios or safety factors when firm safety factor findings were not able to be made, or note events or conditions which ‘saved the day’ or played an important role in reducing the risk associated with an occurrence.