



Australian Government
Australian Transport Safety Bureau

Collision between track worker and passenger train

Guildford, Western Australia | 10 February 2015



Investigation

ATSB Transport Safety Report
Rail Occurrence Investigation
RO-2015-002
Final – 10 March 2016

Cover photo: ATSB

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

Publishing information

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

© Commonwealth of Australia 2016



Ownership of intellectual property rights in this publication

Unless otherwise noted, copyright (and any other intellectual property rights, if any) in this publication is owned by the Commonwealth of Australia.

Creative Commons licence

With the exception of the Coat of Arms, ATSB logo, and photos and graphics in which a third party holds copyright, this publication is licensed under a Creative Commons Attribution 3.0 Australia licence.

Creative Commons Attribution 3.0 Australia Licence is a standard form license agreement that allows you to copy, distribute, transmit and adapt this publication provided that you attribute the work.

The ATSB's preference is that you attribute this publication (and any material sourced from it) using the following wording: *Source:* Australian Transport Safety Bureau

Copyright in material obtained from other agencies, private individuals or organisations, belongs to those agencies, individuals or organisations. Where you want to use their material you will need to contact them directly.

Addendum

Page	Change	Date

Safety summary

What happened

On 10 February 2015, a Public Transport Authority (PTA) maintenance crew commenced work at Meadow Street, Guildford, Western Australia. The crew's assigned tasks included maintaining the pedestrian gates adjacent to the level crossing.

At about 1035 one of the track workers was struck by a Perth-bound suburban passenger train. The track worker sustained fatal injuries.

Meadow St pedestrian gate



Source: ATSB

What the ATSB found

The ATSB investigation found that the PTA maintenance workers had not implemented any form of track worker protection at the work site. This was partially due to the PTA not having documented instructions specifying the level of protection required, preferring that track workers make their own assessment based on their knowledge of the Network Rules. The ATSB found that, under these arrangements, track workers could make an incorrect assessment, placing themselves at a greater risk of being struck by a train.

A review of the safeworking training provided to the track workers found that the training material did provide a suitable level of safe-working knowledge.

Following the occurrence, the toxicology report on the deceased track worker identified the presence of amphetamine and methamphetamine; methamphetamine being a prescribed drug under the *Rail Safety Regulations 2011*. The use of stimulants such as methamphetamine is associated with a range of neurocognitive effects in humans that may affect performance.

The ATSB found that in this instance, the presence of a prescribed drug within the worker's system appeared to be a relatively isolated case. An examination of the company's drug and alcohol policy / procedures found them to be generally effective in managing drugs and alcohol in the workplace.

What's been done as a result

The PTA issued a safety alert following the incident to highlight the importance of implementing the correct level of track worker protection. The subsequent introduction of new safeworking rules, track access accreditation levels and training further supported this.

Further, the PTA has created the role of *Workplace trainer and assessor* with the task of ensuring track workers comply with the network rules by way of competency-based assessments. Implementation of a new track access accreditation system, with improved training and job mentoring, has also commenced.

Safety message

This incident strongly emphasises the need for rail transport operators to provide clear and concise work instructions to employees working within the railway corridor. It also highlights the potential for recreational and other drug use to impair performance and affect workplace safety.

Contents

The occurrence	1
Post-occurrence	2
Context.....	3
Location	3
Track information	3
Train information	4
Event recorders	4
Train crew information	4
Maintenance team information	4
Environmental conditions	4
Maintenance Tasks	5
Worker safety and worksite protection	6
Worksite protection	6
Worker safety	7
Training	7
Safety analysis.....	9
Documented instructions	9
Protection Officer	10
Toxicology	10
PTA's drug and alcohol management program	10
Findings	12
Contributing factors	12
Other findings	12
Safety issues and actions	13
General details	15
Occurrence details	15
Train details	15
Sources and submissions	16
Sources of information	16
References	16
Submissions	16
Australian Transport Safety Bureau	17
Purpose of safety investigations	17
Developing safety action	17

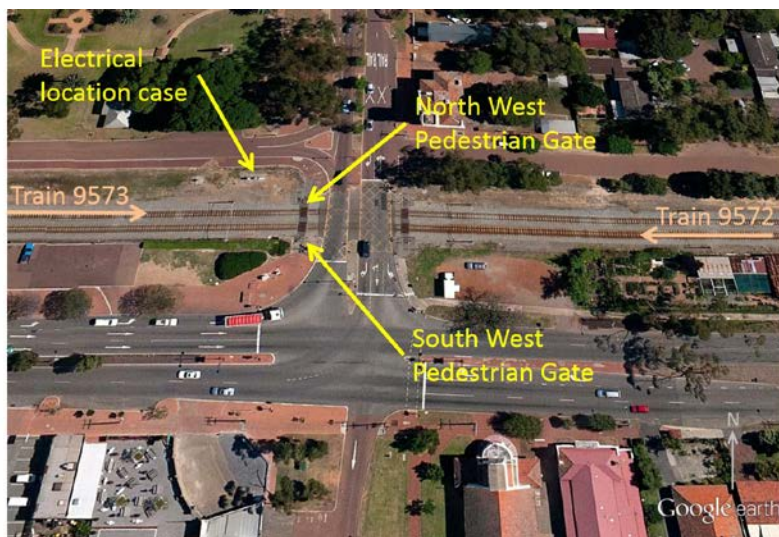
The occurrence

On the morning of 10 February 2015, Public Transport Authority of Western Australia (PTA) signal maintenance crews commenced duty at Claisebrook depot. The crews were arranged into teams according to their qualification and skill sets. One of these teams consisted of a PTA employee and two contractors. The PTA employee was a maintainer, but on this day, he was undertaking the role of the protection officer¹ to provide safe working protection to the contractors. One of the contractors, who had more experience on the PTA network, was assigned the role of signal technician while the other was allocated maintenance duties.

At about 0830, the team departed Claisebrook depot and drove to the Meadow Street level crossing in Guildford, WA. On arrival, the protection officer contacted train control and booked on-track². The team then commenced work, where the protection officer cleaned and maintained the pedestrian gates while the signal technician and maintainer carried out electrical testing.

At about 1019, down³ suburban passenger service 9571 approached the Meadow Street level crossing from the west. When the level crossing protection equipment (gates, lights and bells) activated, the maintainer noticed the north-west pedestrian gate was not closing completely. He advised the signal technician who, as train 9571 passed through the crossing, called the protection officer over to help assess whether the pedestrian gate needed adjusting.

Figure 1: Location map – Meadow Street level crossing, Guildford



The maintenance crew were examining the north-west pedestrian gate until the passage of 9573. They then walked across the walkway to the south-west gate to compare the mechanism adjustments. The protection officer then turned and started to walk back across the railway when he was struck and fatally injured by train 9572. Source: Google Earth annotated by ATSB

At about 1032, train 9573 approached the Meadow Street level crossing from the west (Figure 1). The team, after again observing the operation of the pedestrian gate, decided to compare the control arm settings with the south-west pedestrian gate control arm. After train 9573 had passed through the crossing, the protection officer and the maintainer crossed the railway to the south-west pedestrian gate while the signal technician returned to the electrical location case. The level crossing protection equipment continued to operate because another train (9572) was

¹ Protection Officer is a nationally recognised term to describe a person who provides worksite protection (RISSB Glossary of Railway Terminology 2010) and is used in that context throughout this report. At the time of this incident, a worker who held WPW15 accreditation was responsible for worksite protection, though the term Protection Officer was not used. As of 1 August 2015, the PTA introduced protection officer qualifications, which included additional safeworking training beyond that previously supplied under a WPW15 accreditation.

² Industry term used to describe contacting train control and advising them of the works to be undertaken at that location

³ Trains on the Midland line travelling away from Perth are referred to as 'down' trains, travelling towards Perth as 'up' trains

approaching the crossing from the east, although it could not yet be seen. The maintainer mentioned to the protection officer that there was another train coming, which the protection officer acknowledged.

The protection officer and maintainer examined the south-west pedestrian gate control arm and agreed its adjustment was different to the north-west pedestrian gate. Meanwhile, up suburban passenger service 9572 continued to approach from the east. The driver of 9572 sounded the horn on approach to Meadow Street and noticed two people working on the track side of the pedestrian gates.

Moments later, the protection officer turned to his right, facing away from train 9572, and started to walk towards the track. The maintainer, who saw the train approaching the level crossing, called out a warning and attempted to stop the protection officer. The driver of 9572 saw the protection officer step towards the track and immediately made an emergency brake application.

At approximately 1035, as it passed through the crossing, train 9572 struck and fatally injured the protection officer – coming to a stop a short distance further along the track. The signal technician (at the location case) heard the collision and called out to the maintainer, who replied that the protection officer had been hit by the train.

Post-occurrence

The signal technician and maintainer immediately returned to their vehicle and contacted their supervisor. At the same time, the driver of 9572 contacted train control and advised he had struck a person at the Meadow Street level crossing.

All train services between Bassendean and Midland were suspended and the level crossing closed to traffic. The PTA, emergency services, WA Office of Rail Safety (ORS) and Worksafe WA attended the site.

At about 1200, the signal technician and maintainer were taken back to Claisebrook depot. Drug and alcohol testing was conducted – returning negative results.

At about 1300, train 9572 was moved to the Claisebrook depot for examination.

Context

Location

Meadow Street level crossing is located in Guildford, Western Australia, about 13 km from Perth Railway Station. The level crossing consists of dual-gauge double-track railway over a dual carriageway road with pedestrian walkways on both sides. The crossing is immediately adjacent to the road intersection between Meadow Street and James Street. The road intersection is controlled by traffic lights, which work in conjunction with the level crossing equipment.

The PTA maintained the level crossing and associated pedestrian gates.

Track information

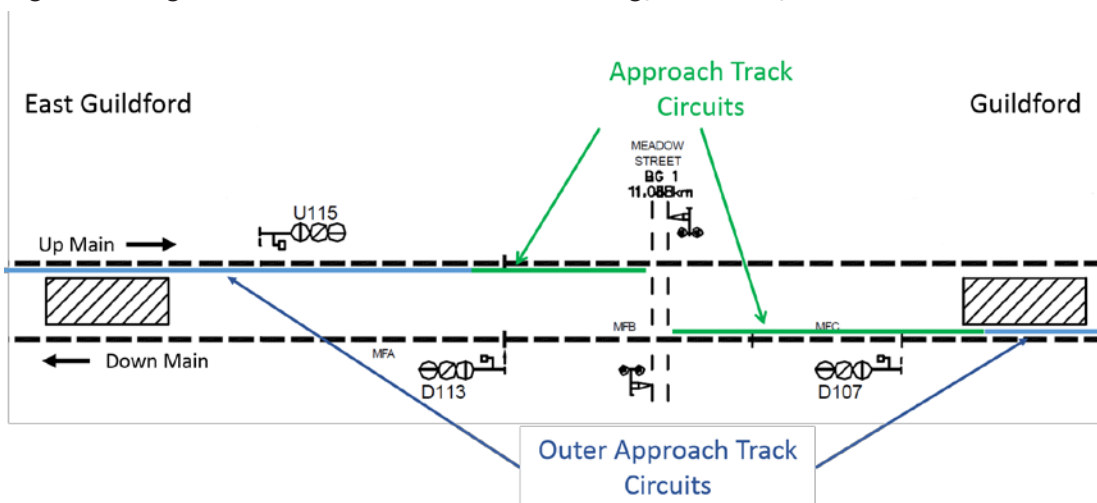
The track at Meadow Street was part of the dual-gauge line from Midland to East Perth; consisting of both narrow gauge (1067 mm) and standard gauge track (1435 mm) using a common rail. The track in this area was part of the Australian *Defined Interstate Rail Network* (DIRN).

The level crossing was equipped with boom gates, flashing warning lights and bells for road traffic. The pedestrian walkway included automatic gates and electronic alarms for pedestrian traffic, with a pedestrian escape route in the event that the gates closed while pedestrians were still crossing the track.

The Meadow Street level crossing used electronic approach and outer approach track circuits to detect the approach of trains from either direction on either line (Figure 2). When a train is detected on the approach, the control circuit causes the level crossing bells and lights to activate, and the boom gates to lower. In addition, the automatic pedestrian gates close and the pedestrian alarms sound. Due to the proximity to the James Street intersection, an indication is provided to the road traffic light control system to manage any traffic intending to turn into Meadow Street.

The purpose of the outer approach circuits is to prevent the level crossing boom gates from rising and descending in quick succession if a second train is approaching the crossing. If the level crossing equipment is already operating and a train detected on the outer approach, the boom gates remain lowered and the pedestrian gates remain closed until the second train has passed.

Figure 2: Diagram of Meadow Street level crossing, Guildford, WA



The level crossing bells and lights operate when trains are detected on the approach track circuits (shown in green). If the crossing is already operating, it will continue to operate if another train is detected on either the approach track circuits or the outer approach track circuits (shown in blue). Source: PTA amended and annotated by ATSB

Train information

The PTA operates two types of electric multiple-unit (EMU) railcars. The A-series EMUs (as involved in this incident) are comprised of two semi-permanently coupled railcars, which are 48.42 m in length and have a gross weight of 114 t. The railcars' maximum operating speed was 110 km/h.

Train services 9572 and 9573 were suburban services, stopping at all stations and operating between Perth and Midland.

Event recorders

The A-series railcars were fitted with an Automatic Train Protection (ATP) system to reduce the risk of train drivers passing a signal at danger / stop. The system also provided digital recordings of train performance such as braking, power applied, speed, etc. However, the A-series were not fitted with dedicated event recorders. In addition to the performance elements described above, an event recorder typically records operation of other mechanical and control systems such as the horn; providing important information to aid in the analysis of a safety occurrence.

Train crew information

Train 9572 was operated by a single driver. At the time of the incident the driver was appropriately qualified and trained to operate A-series railcars over the Perth - Midland route.

Following the incident the driver was tested for the presence of alcohol and other drugs and the results were negative.

Maintenance team information

The signals maintenance team working at Meadow Street consisted of:

- a PTA employee who was qualified in worksite protection and was working as the protection officer
- a contractor qualified and working as a signal technician
- a second contractor with qualifications of a signal technician but working as a maintainer.

All personnel had a safe working qualification allowing them to work within the rail reserve without supervision. The PTA employee (protection officer) had additional safe-working qualifications allowing him to provide worksite protection associated with working on or about the railway reserve.

Drug and Alcohol testing

Following the incident, the signal technician and maintainer underwent preliminary screening for the presence of alcohol and prescribed drugs. Both tests returned a negative result.

As part of the coronial investigation into the accident, a toxicology examination was undertaken on the deceased worker. The examination was unable to confirm the presence of alcohol, but amphetamine and methamphetamine were present in the samples tested. Methamphetamine is classed as a prescribed drug under the *Rail Safety Regulations 2011* - the legislation applicable to the PTA's operations at the time of the incident.

Environmental conditions

A weather report from Perth Airport (approximately 4km south of Meadow Street) showed the temperature at the time of the accident was about 27 degrees, with fine conditions and light winds.

As such, weather conditions were considered unlikely to have contributed to the occurrence.

Maintenance Tasks

The track workers' task was to undertake maintenance of the level crossing and pedestrian gates at Meadow St. The signal technician and maintainer carried out electrical checks, while the protection officer conducted maintenance on the boom gates and pedestrian gates.

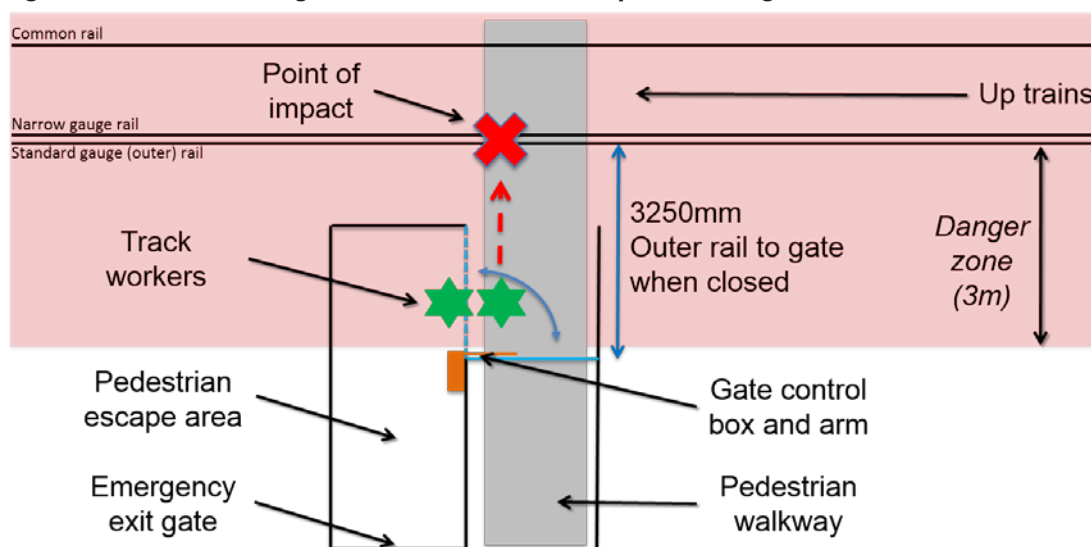
Pedestrian Gates

To facilitate maintenance of the level crossing equipment, certain tasks required the crossing to be operating while the work is being carried out. This work included tasks such as circuit testing and checks of the boom and pedestrian gate operation. In some cases, these tasks required the signal technician or maintainer to work close to or inside the danger zone⁴.

One such task was the inspection and, if required, adjustment of the pedestrian gate closing mechanism. The gate control box was located inside the pedestrian escape, with the control arm running from the box to the gate on the track side (Figure 3) - about 3 m from the railway line.

A level crossing test switch⁵ was provided at Meadow Street that can facilitate operation of the crossing equipment when trains were not present. Despite the availability of a test switch, it was common practice for maintenance personnel to rely on scheduled train services to facilitate operation of the crossing equipment for testing and maintenance of the pedestrian gates. At interview, signalling personnel reported a reluctance to use the test switch, in light of the view that it would (unnecessarily) close the crossing to road traffic. In addition, there was a slight difference in the operation of the pedestrian gates when initiated by the test switch (when gates would close under spring tension only) compared with normal operation when activated by a rail vehicle (when gates would close under a combination of spring tension and motor control).

Figure 3: General arrangement of south-western pedestrian gate



The protection officer and signal maintainer reviewed the operation of the south-western pedestrian gate from the track side of the closed gate (within the danger zone). This examination placed the track workers in a position that was less safe than being within the pedestrian escape area or on the outside of the closed gate. Source: ATSB

Maintenance personnel advised that to assess or adjust the control arm required track workers to stand inside the three-metre danger zone. Some maintainers would carry out the task with the gate open, working in the escape area with the gate acting as a barrier to the track. However, it was evident that some other maintainers carried out the task when the gate was closed, in which case there was no barrier protecting them against inadvertently stepping onto the track.

⁴ Industry term generally considered everywhere within 3m horizontally from the nearest rail and any distance above or below this 3 m, unless a safe place exists or has been created.

⁵ Also known as a flagman switch or manual switch. Used for manually activating the level crossing.

The ATSB's investigation found that the process for conducting maintenance on level crossing pedestrian gates varied between personnel. In the subject case, the workers adopted a process whereby the presence of a train was used to operate the level crossing equipment and maintenance and/or adjustment of the gate control arm was undertaken while the gate was in the closed position. This process meant that workers would be positioned within the danger zone, and focused on the maintenance task, at a time when trains were present, and without a barrier between themselves and the track.

Worker safety and worksite protection

The safety of personnel working on and around operating rail services is achieved through a number of complementary measures. These fall into two general areas:

- **Worksite protection**
These are the measures put in place to mitigate the risk of injury from railway operational hazards. That is, ensuring separation between track workers and train operations.
- **Worker safety**
These are the measures put in place to mitigate the risk of injury from site-specific hazards and task specific hazards.

Worksite protection

To keep track workers separate from rail traffic, rail systems within Australia use various methods of safe working. The higher levels of protection involve exclusion of rail traffic from a worksite and can include the complete closure of the railway (or part thereof). The lower levels of protection permit work to be undertaken between train services and can use other employees to warn track workers of approaching rail vehicles.

Access to maintain suburban railway networks is often more restrictive than for freight networks due to the volume and frequency of rail traffic. Works that require the railway to be closed, even for a short period, are generally only undertaken at night when the frequency of rail vehicles has reduced. Works carried out during the day are usually associated with general maintenance or inspection tasks that do not require closing the railway.

The PTA *Network Rules* document the requirements for providing worksite protection. It is routine for track workers to use *Lookout Protection* when working in the danger zone with hand tools only and with the ability to move to a place of safety prior to the arrival of any oncoming rail vehicle. Rule 191 documents the requirements for lookout protection.

The purpose of lookout protection is to task a person or persons to maintain a watch for approaching trains - allowing track workers to be suitably warned to stop work, move to a *place of safety* and allow the train/s to pass before returning to work. The PTA network rules define a place of safety as either:

- Where there is at least 3 m clearance between the person and the nearest running line (rail);
- Properly constructed for use as a refuge;
- Where a structure or physical barrier has been erected to provide protection; or
- Behind the safety line on a platform.

Under lookout protection, the lookout's sole duty must be to maintain a constant watch for trains and no other work⁶ may be undertaken. A lookout is only required when track workers are within, or likely to go within, the danger zone. Should the work be outside the danger zone, the lookout

⁶ Work is generally defined as any activity within the danger zone other than walking directly from one side of the rail reserve to the other.

may perform other duties, however should track workers resume works within, or likely to go within the danger zone, the lookout must resume the exclusive lookout role.

In this occurrence, the ATSB found that the protection officer had not discussed the worksite protection method with the train controller or the contractors prior to commencing work. It was evident that the role of a lookout had not been allocated, as all three track workers continued to be engaged in maintenance tasks. At the time of the collision, the protection officer was involved with maintenance tasks rather than the assigned role of protection officer.

Worker safety

The PTA had implemented two levels of hazard assessment to ensure worker safety.

- Job Safety Analysis (JSA) forms

Job Safety Analysis (JSA) forms were used to document and assess the risks inherent to conducting the particular job at hand. The JSA for *Maintenance of Automatic Pedestrian Crossing Equipment* provided information such as the number of people required to carry out the job, equipment and training required, and a risk matrix containing a selection of high level generic risks that should be considered prior to commencing the job.

In the context of this incident, the JSA identified 'Being hit by a train' as a potential hazard, with the associated controls identified as 'Adherence to safety procedures - assign competent lookout, obtain prior train information (booking on-track)'.

- Pre-start checklist

Pre-start checklists were used as a record that workers had considered all issues that ensure a task could be undertaken safely. The checklist is a generic form that can be used for any site or task and records information such as date, location, task and names of workers. The checklist records acknowledgment that workers have considered and understand the scope of work and the measures required to undertake the work safely, such as the information contained in the JSA.

The ATSB found that the site team, in this case, had not completed the pre-start checklist prior to commencing work at Meadow Street. While it is likely that the workers were aware of the JSA for pedestrian gate maintenance, there was no record that they had considered the worker safety risk controls contained in it.

Training

To work within the rail corridor⁷ on a railway within Australia, operators and infrastructure owners mandate that personnel are trained and deemed competent in a suitable level of safeworking. The level of training and associated competency assessments, depend on the tasks that the person is expected to carry out. Operators and infrastructure owners typically include training as part of their safety management system.

The PTA network rules stated that all persons require an appropriate *Track Access Permit*, before entering the PTA railway reserve to undertake work at, or closer than 3 metres from the nearest running line or overhead traction power equipment.

The PTA *Appendix to the Network Rules* detailed the typical accreditation level required for various position types. The appendix considers a WPW15 accreditation level for the positions of safe-working technician, electrical fitter / maintainer, as well as track supervisor and / or flag attendant as a minimum. The document *Instructions to Staff Engaged on Maintenance of Signalling Apparatus* also stated that a signal technician must be in possession of a PTA accreditation permit to the WPW15 level.

⁷ Also known as the rail reserve

A simplified safe-working accreditation, designated WPW05, was also available for personnel such as managers, engineers, trades, and technical people working within the rail corridor. However, the PTA rules, instructions and training material all specified that any person undertaking work on the track or associated infrastructure must have, as a minimum, an accreditation level of WPW15. A person with WPW15 accreditation must supervise a person who only has a WPW05 accreditation when that person carries out work.

To obtain accreditation for the PTA network, workers must complete specified individual courses pertaining to the accreditation level. A WPW15 accreditation required a worker to complete courses in *Working on or around the Railway Track*, *Safety Instructions for the electrified area* and *Work Site Protection*. The course *Awareness for unaccompanied access to worksite* provides the majority of the training, which includes a section on how act as a flagman when using Lookout Protection.

In this case, the protection officer had been trained (August 2012) and deemed competent at accreditation level WPW15. The signal maintainer and signal technician both had a WPW05 accreditation at the time of the incident, although the maintainer had completed the necessary training for WPW15 accreditation during the previous week.

It is unclear whether the PTA classifies maintenance on signalling equipment as 'work on track' or 'work on associated infrastructure'. Whilst the work being carried out at Meadow St was predominately undertaken more than 3 m from the track, it is reasonable to consider any work involving signalling equipment is, of its nature, work on associated infrastructure.

Since this incident, the PTA has introduced a new system of safe-working accreditation. This system has removed the WPW05 accreditation level; replacing it with a more rigid tier-based process. The theory-based training will also comprise coaching and on-the-job mentoring, which will form part of the assessment of an employee's competency. Under the new accreditation system, track workers will gain a greater understanding of track protection implementation and operation. The PTA was also planning to internalise safe-working training for all those who work on track, rather than using an external provider. This will provide the ability to monitor and control the quality of training and assessment provided to all workers including contractors.

Safety analysis

Documented instructions

The Western Australia *Rail Safety Regulations 2011* prescribe the requirements that all railway operators in Western Australia must include in their safety management systems. Schedule 1, Clause 17 (4) of the regulations requires a railway operator to have 'systems, procedures and standards' for monitoring and maintenance of rail infrastructure.

The Office of Rail Safety (Western Australia)⁸ makes reference to a publication titled *National Rail Safety Guideline - Preparation of a Rail Safety Management System*⁹ for guidance on the development of these procedures and standards; specifically that railway operators should provide safe work procedures that include:

- A description of the activity
- Identification of the person or position that has a supervisory responsibility for the activity or process
- A clear explanation in sequential order, of the steps or stages comprising the procedure or process
- Identification of potential hazards in the process
- Identification of safety controls to minimize potential risk from any identified hazards

The PTA *Signalling Equipment Maintenance Manual* provided a checklist which detailed all necessary tasks required to maintain automatic pedestrian crossings. The JSA identified the potential hazards and relevant safety controls, while the pre-start checklist recorded workers' acknowledgment of these measures. While individually, these documents addressed the stated requirements of the regulations and guidelines, the accident on 10 February 2015 illustrated that the intent of the system was not met (that is, to ensure work is carried out to a consistent level of quality and safety). Explicitly, there were no instructions requiring that the work on the pedestrian crossing system be carried out in a manner that did not create an increased risk of being struck by operating train services, and was consistent between all maintenance teams.

It was evident that the process for maintaining pedestrian gates varied between work groups. The JSA provided to the track workers advised that Rule 191 (lookout protection) should be adopted when maintaining pedestrian gates. Rule 191 requires workers to '...move from the track and stand clear in a position of safety at least 10 seconds before rail traffic arrives and remain clear until the rail traffic has passed by'. However, for some workers, it was common practice to carry out maintenance and adjustment of pedestrian gates (within the danger zone) while rail traffic was passing. It was evident that the maintenance team at Meadow Street level crossing had adopted this process on 10 February 2015.

An alternative practice adopted by some workers more closely aligned with the requirements documented in Rule 191. This involved maintaining the gates from within the pedestrian escape area while trains were not present. When a train was approaching, the workers would stop the maintenance task and only observe the gate operation. The workers would note any operational issues and, upon passing of the train, would make the necessary adjustments.

In any case, the absence of specific documented instructions meant that maintenance personnel adopted a variety of inspection, adjustment and maintenance practices – some of which may have been inherently less safe than alternatives.

⁸ On 2 November 2015, the Office of Rail Safety (Western Australia) officially transitioned to the Office of the National Rail Safety Regulator (ONRSR) who have subsequently assumed regulatory responsibility in Western Australia.

⁹ Published by the National Transport Commission (2008). The document was republished (2014) by the Office of the National Rail Safety Regulator and titled *Preparation of a Safety Management System Guideline*.

Protection Officer

Toxicology

Following the incident, the Coroner's Court of Western Australia ordered a post mortem examination of the protection officer.

The toxicology examination identified that the blood samples taken were unsuitable to test for the presence of alcohol, and therefore no determination could be made as to whether there was alcohol present within the worker's system at the time of the incident.

However, the examination did identify the presence of methamphetamine and amphetamine in the blood and tissue samples tested. The detected levels exceeded the range considered consistent with therapeutic use¹⁰ and were above the permitted cut off levels as prescribed in the PTA Appendix to the Network Rules and the PTA *Alcohol and Other Drugs* policy.

The use of stimulants such as methamphetamine is associated with a range of neurocognitive effects in humans. Methamphetamine has an elimination half-life ranging from 8 to 13 hours, and its effects typically last a similar amount of time.¹¹ Binge users often experience symptoms associated with heightened anxiety, paranoia and hallucinations, as well as irritability, insomnia and confusion.

In this case, the existence of methamphetamine above therapeutic levels in the protection officer's bloodstream may have affected his performance.

PTA's drug and alcohol management program

The Western Australian *Rail Safety Act 2010* and *Rail Safety Regulations 2010* contain a number of requirements in relation to managing drugs and alcohol. As a result, organisations and their rail safety workers have responsibilities (a safety duty) in relation to managing drugs and alcohol in the work place.

In managing this requirement, the legislation states that an organisation must:

...prepare and implement an alcohol and drug management programme for rail safety workers who carry out railway operations in relation to the rail transport operator's rail infrastructure or rolling stock that complies with this Act.

In accordance with the PTA *Alcohol and Other Drug* policy, employees shall:

...present and remain fit for work, as being impaired by alcohol and/or other drugs may be a hazard or create risks for co-workers and other people at the workplace.

The PTA's policy acknowledges the organisation's responsibilities under the rail safety law and detailed actions to support the management program. The PTA had implemented a testing program – both on a random basis and in response to specific events. The PTA also delivered awareness/education programs to rail safety workers on the effects of alcohol and other drugs.

The PTA required new employees to undertake a pre-employment medical, which included screening for the presence of drugs or alcohol. In addition, the PTA's general induction delivered to staff at the commencement of their employment contained information on their statutory safety duty and the risks arising from the use of alcohol or drugs.

The PTA provided evidence of an ongoing program for both random and targeted¹² screening of rail safety workers for the presence of alcohol and drugs across its operations. Records of random

¹⁰ Royal Adelaide Hospital Emergency Department – *Designer Drug Early Warning System, 12-month Technical Report*, August 2005 to July 2006

¹¹ Scott, J.C., Woods, S.P., Matt, G.E., Meyer, R.A., Heaton, J., Atkinson, J.H. & Grant, I. (2007). Neurocognitive Effects of Methamphetamine: A Critical Review and Meta-analysis. *Neuropsychology Review*, 17, 275-279.

¹² Targeted screening may be undertaken after any rail safety incident, such as a collision or derailment. Testing may also be conducted where suspicion exists that an employee is unfit to perform work because of the use of alcohol and/or other drugs.

screening tests across the organisation indicate that, from 1 January 2014 to the date of this occurrence (10 February 2015), the PTA undertook about 693 tests, 315 of which were conducted at the Claisebrook depot¹³. Nineteen of those were undertaken by signal technicians and maintainers.

Of the 315 tests conducted by the PTA at the Claisebrook depot, two screens returned a positive result. These instances were managed in accordance with the PTA Alcohol and Other Drug policy.

The protection officer involved in this incident had not returned positive results in previous alcohol and other drug test screens.

It was evident that the PTA had implemented a robust program for the management of drugs and alcohol in the workplace. Where an employee's random or targeted testing returned a positive result to either alcohol or a prescribed drug, the PTA had implemented a system of counselling, education and ongoing monitoring through targeted testing to manage future compliance.

¹³ Claisebrook depot comprises of Train Operations (train drivers and train maintenance staff) as well as the Signals division.

Findings

From the evidence available, the following findings are made with respect to the fatality at Guildford, Western Australia on 10 February 2015. 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

- Worksite protection had not been adequately implemented to ensure workers were protected against inadvertently stepping into the path of a train while undertaking maintenance work.
- When maintaining automatic pedestrian crossing equipment, it was common practice for maintenance personnel to adopt a process that was inherently less safe than an alternative.
- **The Public Transport Authority of Western Australia did not have documented instructions to ensure a consistent and safe approach to maintaining automatic pedestrian crossing equipment. [Safety issue]**

Other Safety Factor

- The Protection Officer tested positive to a substance that may impair performance, however it was not possible to determine whether this contributed to the incident.

Other findings

- The Public Transport Authority's *Alcohol and Other Drug* policy was found to be comprehensive and compliant with legislative requirements
- The Public Transport Authority A-series railcars do not have a dedicated system that records events such as the sounding of the horn.

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 rail industry, the ATSB may issue safety recommendations or safety advisory notices as part of the final report.

Documented Instructions

Number:	RO-2015-002-SI-01
Issue owner:	Public Transport Authority of Western Australia
Operation affected:	Rail: Infrastructure
Who it affects:	All owners, operators and maintainers of railway infrastructure

Safety issue description:

The Public Transport Authority of Western Australia did not have documented instructions to ensure a consistent and safe approach to maintaining automatic pedestrian crossing equipment.

Response to safety issue and proactive safety action taken by the Public Transport Authority of Western Australia

The PTA advised that maintenance workers are trained and competent to determine the appropriate level of worksite protection. Furthermore, the PTA stated that 'by not mandating particular rules to particular tasks, the PTA empowers workers to best determine which level of worksite protection best meets the needs of the task/s being performed'.

Notwithstanding this, the PTA advised of the following safety action:

Action number: RO-2015-002-NSA-01

Following the incident at Guildford, the PTA issued Safety Alert PTA01/15 stating that all employees required to work within, or likely to enter, the danger zone must be protected from rail traffic. The Safety Alert also reinforced the requirements of lookout protection.

The PTA also advised that they intend to withdraw the existing Network Rule 191 and replace it with Rule 3013 on 1 August 2015; this being the initial phase in aligning PTA with the Australian Network Rules and Procedures (ANRP). This will provide qualified employees with the following addition protection:

- People performing the role of Lookout have a higher level of training and can only perform that duty;
- Sighting distance must be measured and confirmed;
- Restricts the type of work being done as only hand tools can be used;
- Lookouts must have a break every 60 minutes;
- Only two Lookouts are allowed;
- Provides instruction for worksites using noisy machinery;
- Implements the role of the Protection Officer (Level 1);

- Provides detailed placement and actions of the Lookout and the workers; and
- The Process must be documented.

The PTA would provide additional training to all track workers in the use of the new Rule 3013 *Lookout Working*.

In addition to this, the PTA advised that the General Manager Network Infrastructure had instructed maintenance personnel to adhere to PTA rules and procedures, and that activation of the level and pedestrian crossing was not considered a method of worksite protection.

ATSB comment in response

The ATSB acknowledges that the PTA have taken steps to implement an improved version of lookout working (Rule 3013), but notes that the rule in place at the time of the incident (Rule 191) was largely consistent with the requirements of the new rule. That is, workers are warned of approaching trains, required to stop work, move to a place of safety, and allow the train to pass before returning to work.

While trained workers should be competent at determining the required level of worksite protection, the ATSB found that, when conducting maintenance on automatic pedestrian crossing equipment, some workers implemented the requirements of lookout working while others did not. That is, some workers would carry out the maintenance task (within the danger zone) while rail traffic was passing; an approach adopted by the maintenance team at Meadow Street level crossing on 10 February 2015.

The PTA's safety alert states that workers must be protected from rail traffic and implies that lookout working is considered the minimum level of worksite protection applicable to the task of maintaining automatic pedestrian crossing equipment.

Current status of the safety issue

Issue status: Adequately addressed

Justification: The ATSB is satisfied that the actions taken by the PTA significantly reduces the safety risk, and when combined with completion of the additional training should fully address this safety issue.

General details

Occurrence details

Date and time:	10 February 2015 – 1035 WST	
Occurrence category:	Accident	
Primary occurrence type:	Fatality	
Location:	Guildford, Western Australia	
	Latitude: 31° 53.94' S	Longitude: 115° 58.29' E

Train details

Train operator:	Transperth	
Registration:	AEA239 / AEB339	
Type of operation:	Passenger	
Persons on board:	Crew – 1	Passengers – Unknown
Injuries:	Crew – 0	Passengers – 0
Damage:	Minor	

Sources and submissions

Sources of information

The sources of information during the investigation included the:

- Bureau of Meteorology
- Public Transport Authority of WA
- Brookfield Rail
- National Guideline Glossary of Railway Terminology Version 1.0, 3 December 2010
Railway Industry Safety and Standards Board of Australia (RISSB)

References

- Public Transport Authority Network Rules 2000
- Public Transport Authority Appendix to the Network Rules 2000
- Public Transport Authority, Signalling Equipment Maintenance Manual – Schedule of Maintenance Tasks 8100-600-046
- Western Australia Rail Safety Act 2010
- Western Australia Rail Safety Regulations 2011

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 the Public Transport Authority of Western Australia, the Office of the National Rail Safety Regulator and individuals directly involved in the occurrence.

Submissions were received from Public Transport Authority of WA, and the Office of the 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 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 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.

Australian Transport Safety Bureau

Enquiries 1800 020 616

Notifications 1800 011 034

REPCON 1800 011 034

Web www.atsb.gov.au

Twitter @ATSBinfo

Email atsbinfo@atsb.gov.au

Facebook [atsbgovau](https://www.facebook.com/atsbgovau)

Investigation

ATSB Transport Safety Report Rail Occurrence Investigation

Collision between track worker and passenger train
Guildford, Western Australia, 10 February 2015

RO-2015-002

Final – 10 March 2016