OTSI Office of Transport Safety Investigations

RAIL SAFETY INVESTIGATION REPORT

SELF-HARM FATALITY ON THE EASTERN SUBURBS RAILWAY TOWN HALL – CENTRAL TUNNEL SECTION

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Investigation Reference 04314

Published by: The Office of Transport Safety Investigations

Postal address: PO Box A2616, Sydney South, NSW 1235

Office location: Level 17, 201 Elizabeth Street, Sydney NSW 2000

Telephone: 02 9322 9200

Accident and incident notification: 1800 677 766

Facsimile: 02 9322 9299

E-mail: info@otsi.nsw.gov.au

Internet: www.otsi.nsw.gov.au

THE OFFICE OF TRANSPORT SAFETY INVESTIGATIONS

The Office of Transport Safety Investigations (OTSI) is an independent NSW agency whose purpose is to improve transport safety through the investigation of accidents and incidents in the rail, bus and ferry industries. OTSI investigations are independent of regulatory, operator or other external entities.

Established on 1 January 2004 by the Transport Administration Act 1988, and confirmed by amending legislation as an independent statutory office on 1 July 2005, OTSI is responsible for determining the causes and contributing factors of accidents and to make recommendations for the implementation of remedial safety action to prevent recurrence. Importantly, however, OTSI does not confine itself to the consideration of just those matters that caused or contributed to a particular accident; it also seeks to identify any transport safety matters which, if left unaddressed, might contribute to other accidents.

OTSI's investigations are conducted under powers conferred by the Rail Safety Act 2008 and the Passenger Transport Act 1990. OTSI investigators normally seek to obtain information cooperatively when conducting an accident investigation. However, where it is necessary to do so, OTSI investigators may exercise statutory powers to interview persons, enter premises and examine and retain physical and documentary evidence.

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Once OTSI has completed an investigation, its report is provided to the NSW Minister for Transport for tabling in Parliament. The Minister is required to table the report in both Houses of the NSW Parliament within seven days of receiving it. Following tabling, the report is published on OTSI's website at www.otsi.nsw.gov.au.

OTSI cannot compel any party to implement its recommendations and its investigative responsibilities do not extend to overseeing the implementation of recommendations it makes in its investigation reports. However, OTSI takes a close interest in the extent to which its recommendations have been accepted and acted upon. In addition, a mechanism exists through which OTSI is provided with formal advice by the Independent Transport Safety and Reliability Regulator (ITSRR) in relation to the status of actions taken by those parties to whom its recommendations are directed.

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Background

It is not usual for the Office of Transport Safety Investigations (OTSI) to undertake investigations into fatal rail incidents where the prima facie evidence establishes that rail rolling stock and/or infrastructure has been used by a victim as the means to commit suicide.

Nevertheless, the Chief Investigator may investigate any incident that may affect the safe carrying out of railway operations or the personal security of railway employees and members of the public in railway premises or using a railway.

In this case, the circumstances and location of the incident indicated that there were aspects affecting both safety and security which required an independent investigation with an emphasis on identifying means by which individuals could be prevented from unauthorised entry into sections of the underground CityRail network and the consequential hazards to which the travelling public and railway employees could be exposed.

Incident Overview

At approximately 4:25pm on Wednesday 30 August 2006, a 43 year old woman was struck and killed by CityRail passenger service 10-F in an underground section of the Eastern Suburbs Railway (ESR) between Town Hall and Central Railway Stations, approximately 238 metres North of Platform 25 at Central. The woman's entrance into the tunnel was unauthorised and evidence acquired after the incident indicates that she was intent on committing suicide.

The Police and Emergency Services were notified and upon entering the tunnel system were escorted to the scene of the incident where they found the deceased woman beneath the third carriage of the train. A decision was made to evacuate the passengers through the front of the train utilising the emergency door in the train driver's cab. It was initially estimated that up to 1000 passengers were evacuated from the train and escorted through the tunnel and onto Platform 25 at Central

Station.[1] During the course of the evacuation, Ambulance officers were called to attend to a passenger who suffered an anxiety attack.

The evacuation was completed at approximately 5:40pm and the train was moved at 6:51pm, after which Police completed their examination of the scene and the deceased woman was conveyed to Royal Prince Alfred Hospital for certification of death, and thence to Glebe morgue.

Findings

The investigation revealed that the woman entered the tunnel via stairs leading from the platform to the track surface at the Northern end of Platform 25 at Central Station.

The defences against unauthorised entry into the tunnel system from Platform 25 consist of signage at the tunnel portals, which is clearly visible, indicating that public access to the tunnel system is prohibited, and a CCTV network to monitor public movement on the platform.

The CCTV network is limited as a defence against unauthorised entry into the tunnel system from Platform 25 because the camera best placed to capture movement into the tunnel had its field of vision obscured by a platform structure. Further, although RailCorp's CCTV cameras are 'networked' and monitored centrally, they are not monitored continuously, so there is no mechanism which guarantees that platform or control staff will be alerted to an attempted or actual unauthorised entry into the underground tunnel system from Platform 25. There is also no mechanism outside or within the underground tunnel system to detect and differentiate between train and non-train movement and to alert platform or control staff.

Train Driver's Actions

The woman became visible to the train driver at a distance of approximately 15 metres, at which point the driver responded immediately and appropriately by applying the train's emergency brakes and sounding the horn. The driver did all that was reasonably possible in the circumstances.

[1] This figure was later considered by RailCorp to be in excess of the actual numbers evacuated.

Emergency Response

Police responded to the incident in a timely manner but the on-call crime scene examiner was unable to do so because of another operational commitment. Because of a Police requirement for the train to remain in situ and the prospect of a lengthy wait for the arrival of a crime scene examiner, a decision was taken to disembark passengers and evacuate them, on foot, from the tunnel. While the evacuation was conducted in an orderly fashion, no attempt was made to count the number of passengers that were disembarked and there was therefore no way of readily identifying that the same number of passengers had exited the tunnel system.

Other Matters that would enhance the Safety of Rail Operations

In the event of a train striking and killing a person on its network, RailCorp is obliged by Police requirements to either leave the train's passengers in situ or to evacuate them. Both options can be problematic in certain circumstances, and especially so within a tunnel system, and result in significant disruption to other services throughout the network; there may be scope for a wider range of response options in circumstances where foul play is not at issue.

Recommendations

It is recommended that RailCorp ensures that the entrances to all tunnels on the metropolitan railway that can be accessed via a passenger platform are effectively covered by CCTV.

In addition, it is considered that safety and security on the metropolitan railway system would be enhanced by installing a sensor system capable of alerting the appropriate RailCorp personnel to the entry of persons into the tunnel system. Such a system would desirably be complemented by the installation of technologies capable of detecting and differentiating between train and non-train movement inside the metropolitan rail tunnel system. It is recommended that RailCorp investigate the feasibility of installing such technologies.

In relation to its train evacuation procedures, it is recommended that RailCorp institutes a means of satisfying itself that all passengers are accounted for in circumstances of train evacuation onto the track surface anywhere in the network, and particularly in the tunnel systems.

It is further recommended that the NSW Police, in consultation with RailCorp, examine response options to expedite the release of trains on RailCorp's network when it can be readily and reasonably determined that a fatality is the result of an act of intentional self harm or where no element of foul play can be established.

PART 1 CIRCUMSTANCES OF THE INCIDENT

Incident Synopsis

1.1 At approximately 4:25pm on Wednesday 30 August 2006, a 43 year old woman was struck and killed by CityRail passenger service 10-F in an underground section of the Eastern Suburbs Railway (ESR) between Town Hall and Central Railway Stations, approximately 238 metres North of Platform 25 at Central. The woman's entrance into the tunnel was unauthorised and evidence acquired after the incident indicates that she was intent on committing suicide.

Train and Location Information

1.2 CityRail passenger service 10-F was an eight car Tangara which originated at Bondi Junction at 4:12pm and was due to terminate at Thirroul at 6:17pm. At the time of the incident, it was estimated that the train was carrying up to 1000 passengers, and while the exact number was not determined, it was subsequently assessed to be less than the first estimation.

1.3 The Eastern Suburbs Railway (ESR) is part of the Sydney Metropolitan railway and extends from Erskineville through to Central and thereafter to Town Hall, Martin Place, Kings Cross, Edgecliff and Bondi Junction.

1.4 The ESR runs underground from Erskineville to Martin Place before surfacing and passing over a viaduct. Thereafter the ESR reverts to an underground system, which includes the Kings Cross and Edgecliff stations, before once again emerging for a short distance before entering a final section of tunnel into Bondi Junction. There are a number of crossovers at Bondi Junction, with the crossover to the West of the station allowing train services to be transposed. During this process, train drivers move to the other end of the train in preparation for the return journey to the city and beyond.

Before the Incident

1.5 CCTV footage shows the woman on Platform 25 of Central Station between 2:41pm and 3:10pm but then disappearing as she steps behind a column at the Northern end of the platform (*see Photo 1*). She was not seen to re-

appear from this area, and it is concluded that at about 3:10pm, she used the stairs at the end of the platform to access the track surface and enter the tunnel.

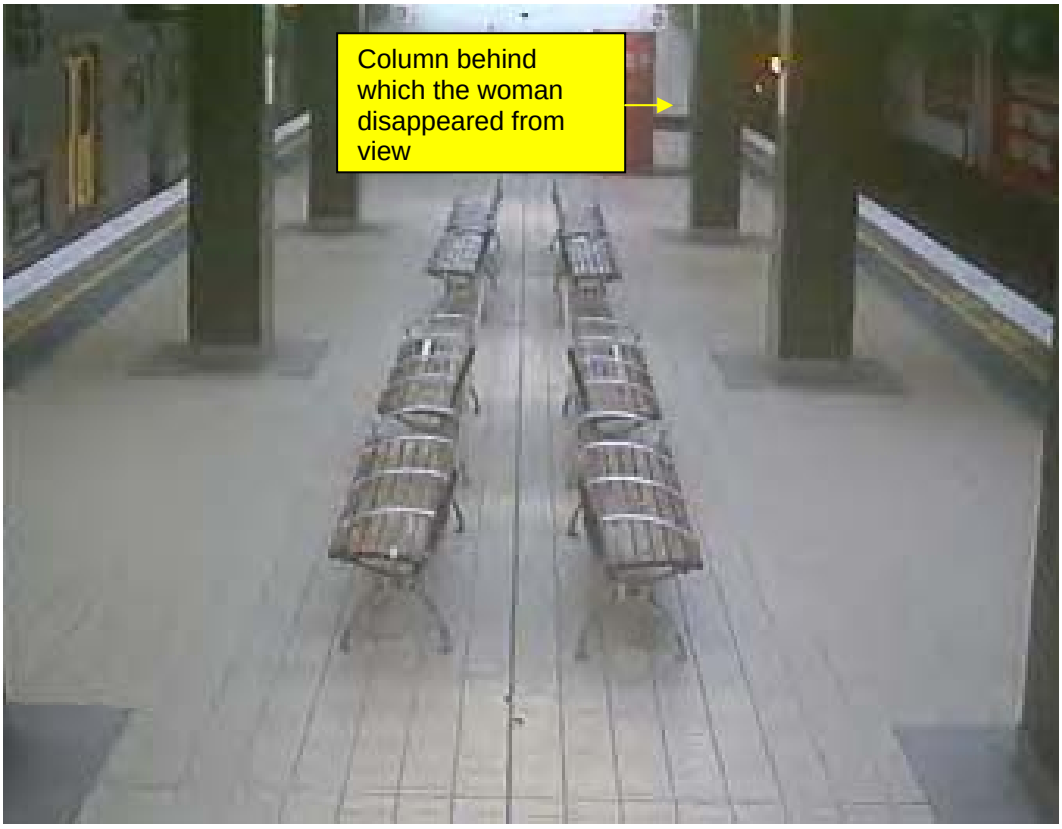

Photo 1: CCTV frame showing Platform 25. Note the extent to which vision of the tunnel portals is obscured by the columns

1.6 Some 75 minutes elapsed between 3:10pm and the time the victim was struck by 10-F at approximately 4:25pm, during which time several other trains passed through the tunnel. It is assumed that during this intervening period, the woman positioned herself in one of the 'refuges' within the tunnel.[2]

The Victim

1.7 NSW Police established that for a number of days leading up to her death, the victim had been staying, voluntarily, at a refuge in Surry Hills. She checked out of the refuge at approximately 9:30am on the day of the incident and her movements up until arriving at Platform 25 at Central are unknown.

[2] The refuges are intended to provide a safe place for rail workers who, for a variety of reasons, might have to remain within a tunnel while trains are passing through it.

1.8 That she was intent on committing suicide was established through the contents of a notebook which was recovered from the incident site.

The Incident

1.9 As the 10-F traversed the ESR in the section between Town Hall and Central Stations, it rounded a bend in the tunnel at a point some 238 metres North of Central and the driver of the train saw the woman, at a distance he estimated to be 15 metres, walking in the 'four foot'[3] with her back to the train.

1.10 Doing all that he could in the circumstances, the driver immediately sounded the train's horn and applied the emergency brakes but could not prevent the train from striking the woman.

After the Incident

1.11 The driver of 10-F contacted Train Control which in turn contacted the Police and Emergency Services who responded in a timely manner. The Police entered the tunnel at Central at 4:37pm and were escorted to the third carriage under which the deceased woman was located. Police were obliged by standard operating procedures to declare the site a crime scene and to contact a crime scene examiner. However, the on-call crime scene examiner was not immediately available as he was at the scene of another incident.

1.12 In view of the Police requirement for the train to remain in situ and the potential for a lengthy delay awaiting the arrival of the crime scene examiner, the Police directed that the passengers be evacuated from the train. The evacuation was effected via the front of the train utilising the emergency door in the train driver's cab and on foot through the remainder of the tunnel to Platform 25 at Central Station.

1.13 The evacuation took 50 minutes to complete. Initial estimations were that up to 1000 passengers were evacuated and escorted through the tunnel to Central Station.[4] However, given that RailCorp's experience in trial evacuations was that 6-10 passengers could be evacuated per minute, the probability is that there were fewer passengers on 10-F, or that passengers

[3] The 'four foot' is a term used to describe the area on a track within a set of rails. The space between two sets of tracks is known as the 'six foot'.

[4] This figure was later considered by RailCorp to be in excess of the actual numbers evacuated.

were disembarked at almost twice the speed previously attained during trials. The latter scenario is less plausible, especially so given that portable landings, designed to be used in conjunction with ladders, could not be located during the evacuation.[5] Notwithstanding this difficulty, and the requirement for ambulance officers to attend to a passenger who suffered an anxiety attack, the evacuation was conducted in an orderly fashion.

1.14 It transpired, however, that no attempt was made to count the number of passengers who were disembarked and there was therefore no way of readily confirming that the same number of passengers exited the tunnel system at Central's Platform 25, or establishing the rate at which passengers could be evacuated in a non-exercise scenario, which may have proven a useful measure in future evacuation planning. In any event, there is a need for RailCorp to institute a means of satisfying itself that all passengers are accounted for in circumstances of train evacuation onto the track surface anywhere in the network, and particularly in the tunnel systems.

1.15 The crime scene examiner arrived at the site of the fatality at 6:40pm and the train was released by the Police to move at 6:51pm. The Police then completed their examination of the scene and the deceased woman was conveyed to Royal Prince Alfred Hospital for certification of death, and thence to Glebe morgue.

1.16 As a result of the incident and the requirement to close the tunnel to other services while 10-F was in situ, there were extensive delays and cancellations of other scheduled services. Stations on the ESR were also shut down and one train standing at Kings Cross lost power which resulted in its passengers also having to be detrained. It became apparent that this train's battery supply was not capable of supporting the train for the duration of the overhead power outage which had resulted from an emergency services requirement that RailCorp isolate the overhead power supply. The net effect was that a major component of the Sydney metropolitan passenger transport network was disrupted.

[5] It was later established that these landings had been removed temporarily for modification.

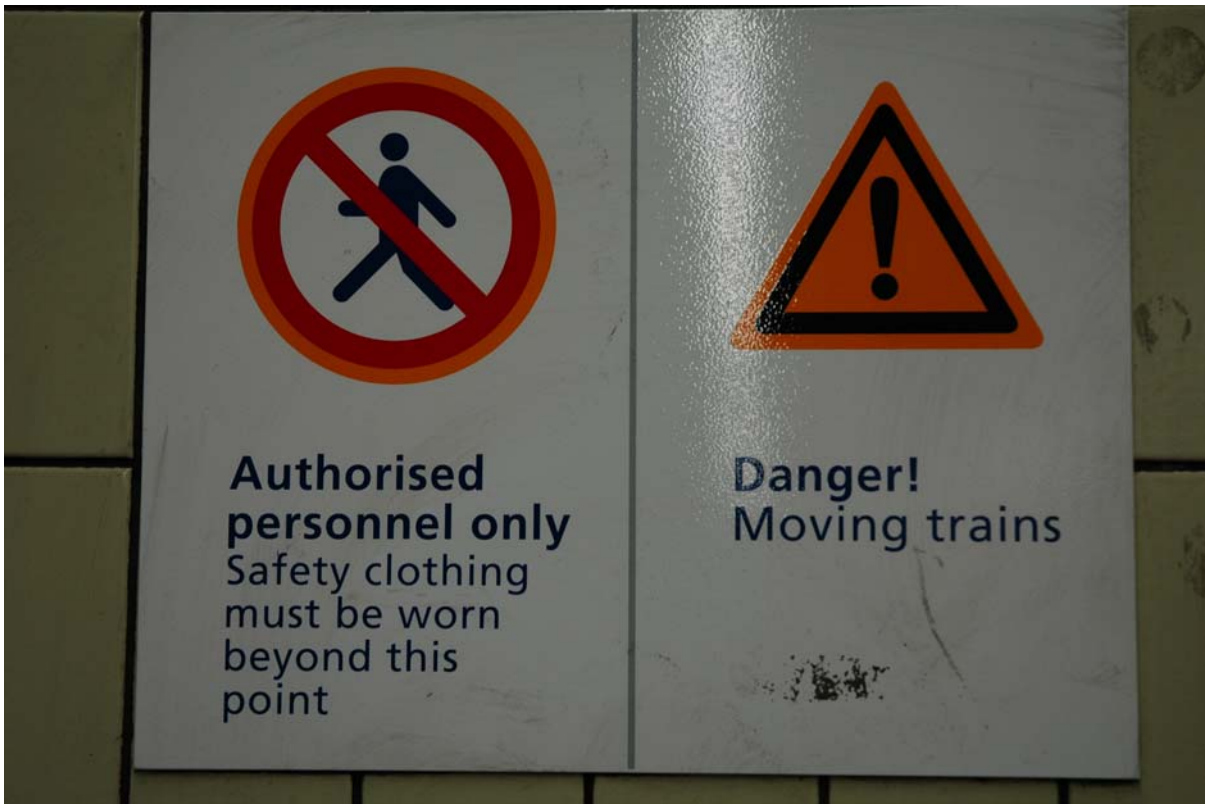

Photo 2: Warning signs at Platform 25, Central Station

Safety Defences

1.17 The access restrictions and dangers associated with entry into the ESR tunnel system are described on clearly visible Warning Signs at Central Station's Platform 25 (see *Photo 2).* CCTV cameras are positioned along the platform but constitute only a limited defence against unauthorised entry into the tunnel system from Platform 25 because:

i. the camera best placed to provide coverage of the tunnel's portals has its field of vision obscured by a row of columns (see *Photo 1*);

ii. although RailCorp's CCTV cameras are 'networked' and monitored centrally, each camera is not monitored continuously and there is no mechanism which alerts platform or control staff to an attempted or actual unauthorised entry into the underground tunnel system from Platform 25, and

iii. there is no mechanism prior to or within the underground tunnel system to detect and differentiate between train and non-train movement and to alert platform or control staff.

1.18 Since tunnels must of necessity provide unrestricted access for trains during timetabled operating hours, the defences against unauthorised entry into and within tunnels need to incorporate active measures as well as passive warnings. In the case of the ESR tunnel system, there is scope for improving its defences. The CCTV cameras at Platform 25 could be repositioned or additional cameras installed to provide unobscured coverage of the portals[6] and adjacent platforms (similar action may also be beneficial at other stations and platforms in the ESR and City Circle systems). Small mass motion sensors and infra-red CCTV could be used to detect and track non-train movement within the tunnel system and alert security system operators to the presence of persons in the tunnels (the infra-red CCTV capability could also be useful during the conduct of evacuation operations). Such measures would allow a CCTV operator to immediately alert the signaller controlling the rail section that the tunnel had been illegally entered and to request that signals be placed at stop. Although trains in close proximity to a changing signal would not be able to stop immediately, distant trains would have greater warning. Though trains might still have to be bought to a stand within a tunnel to allow for the removal of anyone who had entered the tunnel, the resulting disruption would be far less than that caused by a fatality.

Other Safety Matters

1.19 Under emergency response arrangements in place at the time, RailCorp was obliged by Police requirements to hold any train involved in a fatal accident at the site of the incident until the Police crime scene examination was completed. In such a circumstance, it is necessary for RailCorp to make a decision whether to leave passengers onboard the train until it has been released by the Police to continue its run, or to disembark them as soon as possible. Both courses of action involve inherent risks and responsibilities, particularly if the incident has occurred in a tunnel. If the decision is taken to hold passengers on board, it must reflect some appreciation for the time the Police and emergency response operation is likely to take, and the

[6] Any planned upgrade to the CCTV system should take into account that the Council of Australian Governments (COAG) has agreed on a national guideline for the development of CCTV systems, *The National Code of Practice for CCTV Systems for Mass Passenger Transport Sector for Counter Terrorism.*

consequential necessity for a comprehensive and executable plan to manage their anxiety, frustration and their personal and health requirements. If the decision is made to disembark passengers and to evacuate them other than by train to train evacuation or by using hi-rail emergency vehicles, there is the challenge of managing the movement of potentially large numbers of individuals representing a diverse demographic distribution in the difficult conditions which prevail on the track surface, exacerbated in circumstances where the evacuation has to be effected in a tunnel system (*Photo 3* indicates typical lighting and walking conditions within the ESR tunnel). The assistance and control measures in such an evacuation necessitate the commitment of considerable resources to ensure safe and expeditious clearance from the incident site. Determination of the best course of action should be based on a risk analysis of the options and the relevance of emergency plans to the prevailing circumstances

Photo 3: Typical lighting and walking conditions inside the ESR tunnel system

1.20 If a person is struck by a train on the rail network and it can be readily established by the attending Police that the person is clearly deceased and

that there are no indications of foul play, OTSI believes that there should be discretion for attending Police to authorise the recovery of the body and the movement of the involved train from the scene. This provision would only apply in circumstances where the evidentiary value of holding the train and preserving the incident scene is limited and when CCTV footage and witness accounts indicate that the cause of the accident is intentional self harm. Such a course of action would be based on a judgement call by Police, considering factors such as the location of the incident and, as in this case, the risks involved in holding and evacuating loaded trains. OTSI believes that this approach more appropriately balances the Police need to collect evidence with RailCorp's obligations to its passengers and the wider public. In making this observation, OTSI is not advocating that RailCorp's train drivers be authorised or required to drive on after striking someone on the track. Rather, drivers should continue to be required to bring their train to a stop and report the incident so that emergency response can be arranged for injured parties. OTSI also appreciates that such incidents are highly stressful for train drivers and that it may be necessary for rail operators to deploy a relief driver before moving a train after such a circumstance.

1.21 As at August 2008, OTSI inquiries established that RailCorp's network rules and procedures for dealing with incidents of this nature had remained unchanged from those in effect at the time of this fatality. However, in July 2007, representatives from the NSW Police and RailCorp met with the State Coroner and gained approval for the drafting of new guidelines for dealing with a number of the issues touched upon in this report. In close consultation with RailCorp, the NSW Police drafted guidelines titled "*Fatalities, Serious Injuries and Attempt Self Harm on Rail Property."* These guidelines were implemented in part during the World Youth Day event in July 2008. An amended version which included incidents outside the Sydney metropolitan area was expected to be forwarded to the State Coroner for sign-off by the end of August 2008. Although the content of the draft guidelines was not made available to OTSI, assurance was given that the guidelines have addressed a number of the problems associated with rail incident scene processing as highlighted in this report.

PART 2 FINDINGS

2.1 In relation to those matters prescribed by the Terms of Reference as the principal lines of inquiry, OTSI finds as follows:

a. Point of Entry

The woman entered the tunnel via stairs at the Northern end of Platform 25 at Central Station.

b. Existence and Adequacy of Defences to Prevent Unauthorised Access into the Tunnel System

i. The defences against unauthorised entry into the tunnel system from Platform 25 consist of a CCTV network to monitor public movement on the platform and clearly visible signage at the tunnel portals indicating that public access to the tunnel system is prohibited.

ii. The CCTV network is limited as a defence against unauthorised entry into the tunnel system from Platform 25 for the following reasons:

(1) the camera best placed to capture movement into the tunnel had its field of vision obscured by a platform structure;

(2) although RailCorp's CCTV cameras are 'networked' and monitored centrally, in the absence of each camera being monitored continuously, there is no mechanism which guarantees that platform or control staff will be alerted to an attempted or actual unauthorised entry into the underground tunnel system from Platform 25, and

(3) there is no mechanism prior to or within the underground tunnel system to detect and differentiate between train and non-train movement and to alert platform or control staff.

c. Appropriateness of Train Driver's Actions

The train driver did all that he could in the circumstances but could not prevent the train from striking the woman.

d. Effectiveness of the Emergency Response

i. Police responded to the scene of the incident in a timely manner but the on-call crime scene examiner was unable to do so because of another operational commitment.

ii. In the face of a Police requirement that the train remain in situ and the prospect of a lengthy wait for the arrival of a crime scene examiner, a decision was taken to disembark passengers and evacuate them, on foot, from the tunnel. While the evacuation was conducted in an orderly fashion, no attempt was made to count the number of passengers that were disembarked and there was therefore no way of readily identifying that the same number of passengers had exited the tunnel system.

e. Other Matters that would enhance the Safety of Rail Operations

In the event of a train striking and killing a person on its network, RailCorp is obliged by Police requirements to either leave the train's passengers in situ or to evacuate them. Both options have inherent risks and responsibilities, especially so within a tunnel system, resulting in significant disruption to other services throughout the network; there may be scope for a wider range of response options in circumstances where foul play is not at issue.

PART 3 RECOMMENDATIONS

3.1 In order to reduce the likelihood of an incident of this nature recurring and to enhance safety and security on RailCorp's network more generally, the following remedial safety actions are recommended for implementation by the organisations specified below:

a. RailCorp

i. Ensure that the entrances to all tunnels on the metropolitan network that can be accessed via a passenger platform are effectively covered by CCTV.

ii. Investigate the feasibility of enhancing safety and security on the metropolitan railway by installing a sensor system capable of alerting appropriate RailCorp personnel to the entry of persons into the tunnel system.

iii. Investigate the feasibility of installing technologies capable of detecting and differentiating between train and non-train movement inside the metropolitan rail tunnel system.

iv. Enhance its train evacuation procedures by instituting a means of satisfying itself that all passengers are accounted for in circumstances of train evacuation onto the track surface anywhere in the network, and particularly in the tunnel systems.

b. NSW Police Force

In consultation with RailCorp, examine response options to expedite the release of trains on RailCorp's network when it can be readily and reasonably determined that a fatality is the result of an act of intentional self harm or where no element of foul play can be established.

Appendix 1: Sources and Submissions

Sources of Information

- NSW Police
- RailCorp

References

Transport Administration Act 1988 (NSW)

Rail Safety Acts 2002 and 2008 (NSW)

Submissions

The Chief Investigator forwarded a copy of the Draft Report to the Directly Involved Parties (DIPs) to provide them with the opportunity to contribute to the compilation of the Final Report by verifying the factual information, scrutinising the analysis, findings and recommendations, and to submit recommendations for amendments to the Draft Report that they believed would enhance the accuracy, logic, integrity and resilience of the Investigation Report. The following DIPs were invited to make submissions on the Draft Report:

- The Independent Transport Safety and Reliability Regulator
- NSW Police Force
- RailCorp

Submissions were received from all of the Directly Involved Parties:

The Chief Investigator considered all representations made by DIPs and where appropriate reflected those representations in this Final Report.