



Office of the Chief Investigator  
Transport and Marine Safety Investigations

**Rail Safety Investigation**

**No 2007 / 12**

# Brief Report

Southern Cross Passenger Yard

Collision

16 November 2007



## Scope and Reporting

### The Chief Investigator

The Chief Investigator, Transport and Marine Safety Investigations is a statutory position established on 1 August 2006 under Part V of the *Transport Act 1983*.

The objective of the position is to improve public transport and marine safety by independently investigating public transport and marine safety matters.

The primary focus of an investigation is to determine what factors caused the incident, rather than apportion blame for the incident, and to identify issues that may require review, monitoring or further consideration. In conducting investigations, the Chief Investigator will apply the principles of 'just culture' and use a methodology based on systemic investigation models.

The Chief Investigator is required to report the results of investigations to the Minister for Public Transport and / or the Minister for Roads and Ports. However, before submitting the results of an investigation to the Minister, the Chief Investigator must consult in accordance with section 85A of the *Transport Act 1983*.

The Chief Investigator is not subject to the direction or control of the Minister(s) in performing or exercising his or her functions or powers, but the Minister may direct the Chief Investigator to investigate a public transport safety matter or a marine safety matter.

### Issuing of a Brief Report

In those cases where an investigation is curtailed or a full investigation report is not considered warranted, the Chief Investigator may issue a Brief Report.

A Brief Report will typically include the particulars of the event, a description of the incident, a summary of pertinent investigation information and key findings and, as applicable, a description of identified safety issues and recommended safety actions.

**Occurrence Details**

**Date:** 16 November 2007

**Time:** 1530

**Location**

Southern Cross Passenger Yard Bank sidings, Melbourne.

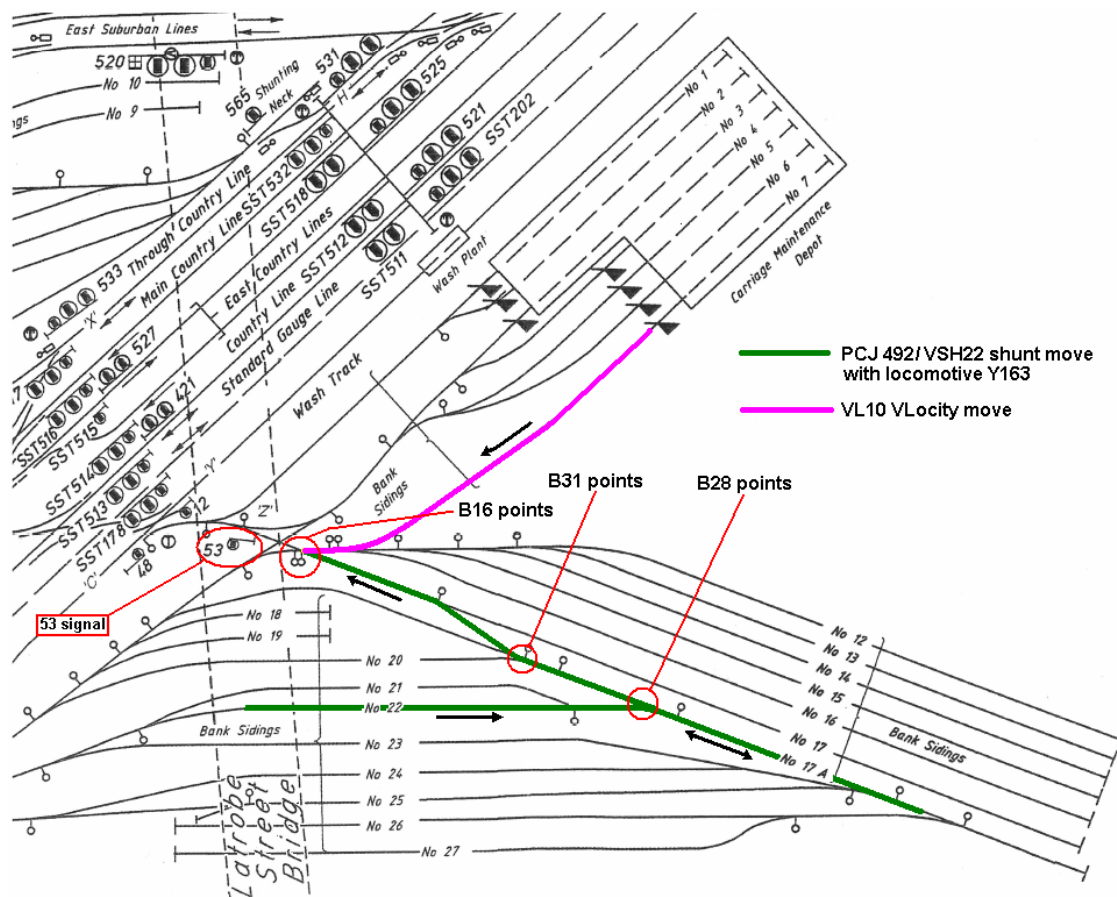


Figure 1. Yard with relevant tracks identified

**Trip / route details**

The incident occurred during shunting operations within the Southern Cross Passenger Yard.

**Incident outcomes**

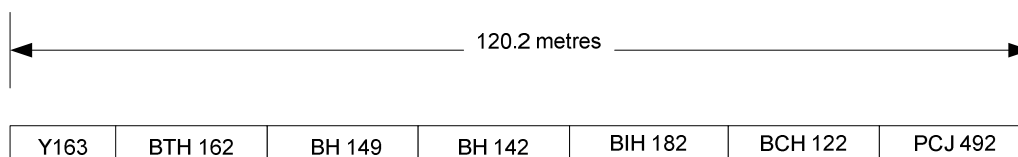
Power van PCJ 492 which was attached to car set VSH 22, collided with the side of VLocity car 1210 resulting in both vehicles derailing and coming to rest at an angle inclined to the normal of about 30 and 45 degrees respectively.

**Vehicle details**

**VSH Car set**

VSH 22 car set consisted of passenger cars BCH122, BIH182, BH142, BH149, BTH162 and power car PCJ 492. The car set was hauled by shunt engine Y163.

The total length of the train was 120.2 metres.



VSH car sets are primarily used on inter-urban services to Bacchus Marsh, Sunbury, Geelong, Kyneton and Seymour. Saloon power to the cars is supplied in the form of Head End Power (HEP) from N or P class locomotives or alternatively from a power van when A class locomotives are assigned to the service.

Power van (PCJ 492) contained a diesel alternator which occupies about half the van with the remaining section housing the handbrake and emergency air valve. This section is accessed by a door on each side of the van approximately mid-way along the van. The handbrake and emergency air valve are located near one of the access doors. There are no windows at either end of the van.

The BCH car is equipped with a conductor's compartment. The conductor's compartment is accessed by two side doors an emergency air brake valve is located near each of these doors.

#### **VLocity 1210**

VLocity units consist of one DM railcar semi permanently coupled with one DM (D) railcar, with each of the cars having driver's cabs at the opposite ends and are referred to as VL sets which utilise the last two digits of the car numbers. In this case the set was referred to as VL10. The total length of the two-car unit is 50.51 metres.

#### **Vehicle operator**

V/Line Passenger Pty Ltd.

#### **Infrastructure manager**

Connex Melbourne Pty Ltd.

#### **Environmental details**

The weather was clear and sunny.

## Circumstances

### Background / context

The Southern Cross Bank sidings passenger yard operates on both a day and afternoon shift with the afternoon shift commencing at 1400. On the day of the incident the 1400 shift consisted of the normal work group of three shunters and a locomotive crew of two. The operation was supervised by a yard foreman who also performed the co-ordination role for shunt and train movements for the entire complex. The administration / line management role was performed by a yard master who works a day shift roster.

The role of the leading shunter was to co-ordinate both the yard pilot and other train movements within the Bank sidings and to ensure train sets are marshalled and shunted in a timely manner to their respective platforms to meet timetable requirements.

In the Southern Cross Bank sidings yard, it was normal for the driver of the shunt locomotive to be situated on the north side of the locomotive with his assistant seated on the south side.

Train and shunt movements were signalled from the No.1 signal box under the direction of the yard foreman or leading shunter.

Communications between the Bank siding leading shunter, other shunt gang members and the signaller in No.1 signal box was via radio on a designated channel. The company rules and procedures did not allow for this frequency to be used for general communication or shunt commands between shunters and locomotive crews. All shunt commands were to be given by hand signals.

In January 2007, V/Line conducted an operational risk workshop in relation to shunting activities at the Southern Cross Passenger Yard. The workshop identified the following key risks:

- loss of sight between shunter and driver when docking trains from the Bank sidings;
- poor communication between shunter and driver – not clarifying set move;
- unofficial shunting with radio;
- current procedures not known or not adhered to;
- procedures that are not able to be adhered to; and
- staff performing work in the pit (between platforms) area.

The company Risk Treatment Plan issued in September 2007 indicated that these risks had been addressed or completed in April 2007, seven months prior to the incident on 16 November 2007.

### Sequence of events

On Friday 16 November 2007 the 1400 Southern Cross Passenger Yard shunt pilot and shunters were conducting shunting operations under the supervision of a yard-master and instructions from a leading shunter.

During the shift the leading shunter was assigning shunt tasks to the gang as required.

At 15:19:04, the lead shunter (who was located in the shunter's cabin near points B16) issued an instruction, by Administration radio channel 7, for car set VSH 22 to be shunted from track 22 to Southern Cross Station Platform 2. The car set was to operate the 1646 Bacchus Marsh service.

The shunt movement of VSH 22 was under the control of two yard shunters – a requirement for sets with five cars or more. The shunter in charge of the movement was situated in the door of the power van (the leading vehicle when the locomotive was pushing the car set) with the other shunter in the middle vehicle of the train. Both shunters were operating on the north side of the car set to facilitate the display of hand signals used to convey instructions to the locomotive driver.

After the car set had cleared points B28 from track 22 the points were altered to allow the car set to be pushed along track 17a towards signal 53 to dock at platform 2.

At 15:22:23, the driver of VL10 sought and received authorisation from the leading shunter to proceed from the maintenance facility along track 7 towards signal 53 and then to the Southern Cross Station platforms. The train was to operate the 1550 Sunbury service. The driver of VL10 was instructed by the lead shunter to stop his train opposite the Shunter's cabin. The driver complied with this instruction which resulted in VL10 standing over hand operated points B16 at 15:30:46 and "fouling" all movements from tracks 12 to 17a while waiting for a proceed aspect on signal 53.

As the shunt move with the VSH 22 car set progressed along 17a it reached a maximum speed of 12 km/h and travelled about 38 metres before the power van commenced traversing the right hand curve of points B31. At this stage the power van was about 50 metres from VL10 and the shunter crossed to the opposite side of the power van to maintain his line of sight. As he did he observed VL10 stationary immediately ahead and turned to apply the emergency air brake. However, the power van collided with VL10 before braking became effective.

As the car set was being pushed along track 17a the assistant on the locomotive, who was situated on the south side of Y163 and about 120 metres back from the front of the power van, noticed a VLocity moving in the same direction ahead on his right. When he observed the power van veering to the right he did not communicate with the driver as he did not believe there was any conflicting move occurring.

VL10 was stationary for between seven to 10 seconds prior to the impact.

**Summary Investigation Information and Findings****Personnel**

All personnel involved in the incident were qualified for their respective roles and held current medical certificates.

During his interview the leading shunter alleged there were work load issues for his role due to increasing volume and complexity of shunt movements brought about by altered timetable requirements in 2007. This situation had previously been identified as a risk for the area in the January 2007 risk workshop.

The leading shunter also reported that he had been regularly rostered on overtime and on this particular shift had commenced work four hours earlier to compensate for ongoing staff shortages. This situation had previously been identified as a risk for the area in the January 2007 risk workshop.

**Vehicle(s) and equipment**

All vehicles involved in the incident were authorised to operate on the Connex and V/Line networks and no faults with the vehicles were identified.

**Infrastructure**

There were no identified faults with the infrastructure.

**Operations**

The effectiveness of the operational systems in place at the time of the incident is the subject of identified safety issues and recommended safety actions detailed in this report.

The investigation found that the application of the actions identified in the Risk Treatment Plan arising from the January 2007 risk workshop either were not completed or ineffective in their application.

**Identified Safety Issues and Recommended Safety Actions (RSA)****Communications**

The investigation identified that the workforce have introduced an informal work around for the area and that a significant amount of communications and movement authorisations, particularly driver-only operations, between the leading shunter and locomotive drivers is via the shunters dedicated radio channel. This method of working has previously been identified as a high risk activity for the area in the January 2007 V/Line operational risk workshop.

In general, radio procedures by the shunting gang were undisciplined.

**RSA 2008013**

V/Line review protocols for the use of radio communications in the Southern Cross Yard complex.

**Operations – vehicle separation**

The safe operation of the Bank sidings relies on train / shunt movement authorisation as the primary defence to maintain vehicle separation. This authorisation is given by the leading shunter, however the company does not provide shunters with instructions in how authorisations are to be formatted, communicated or acknowledged. It was found that some shunters have developed procedures that involve a system where shunt moves are controlled in such a manner that trains are not moved beyond certain points without the lead shunter's knowledge.

**RSA 2008014**

V/Line review and define procedures for shunting in the Southern Cross Bank sidings.

**Power van design**

The design of the power van affects sighting in the direction of travel from the vehicle. A shunter, to effectively observe an obstacle in the path of the vehicle, is required to place a part of their body outside the loading gauge of the vehicle (this is also the case with the use of all hand signals). This exposes the shunter to the potential of injury from passing infrastructure and other vehicles; it is also in contravention of company procedures. Also, the ease of access and as a result the timeliness with which the shunter can control the emergency air brake valve is dependent upon the side of the power van he is operating from.

The design limitations for this type of vehicle during shunting operations have been recognised by the company and the workforce and have been the subject of previous risk assessments which resulted in altered working arrangements for this type of vehicle.

**RSA 2008015**

V/Line reviews the method of shunting with PCJ power vans as the leading vehicle.

(Note: V/Line has advised that recommendation 2008015 has been actioned).

**RSA 2008016**

V/Line reviews shunting processes in regard to movements that require shunters to place their bodies outside the vehicle loading gauge.



**Human resource management**

Both locomotive crew members had more than 20 years train driving experience. However, both had limited experience working as a two-crew team on shunt locomotives. The fact that the second crew member appeared not to have a designated role to play throughout the shunt movement and that the driver was not aware of the route and destination of the shunt he was involved in is an indication of poor team management and work procedures. Poor communication had previously been identified in the January 2007 risk workshop.

**RSA 2008017**

V/Line reviews the tasks of each member of the shunt team, including locomotive crew members and provides a process that is aimed at improved definition of roles and communications between each member.

**System Monitoring**

1. The company's action in respect to both the application and the closeout of issues identified in the Risk Treatment Plan dated January 2007 was identified as either ineffective or not completed.

**RSA 2008018**

V/Line reviews their safety management system in respect the application and effectiveness of risk management plans.

2. The company has a competency and performance audit regime for drivers and shunters. Audits are conducted twice a year. A review of the audit criteria identified that, in the case of locomotive drivers, they are not assessed in the role of second crew member on a yard shunt pilot. Shunters are not assessed in the application of providing / receiving movement authorisation into or out of the Bank sidings.

**RSA 2008019**

V/Line reviews driver and shunter performance auditing to ensure that all tasks are adequately assessed.

**Decision to Curtail Investigation**

In this instance the Chief Investigator does not consider further investigation into the incident to be warranted. The train operator, V/Line Passenger Pty Ltd, have conducted an investigation into this incident. The investigation has identified that the outcomes of the January 2007 risk assessment have not been adequately implemented. The company is addressing this issue.