



**Report 00-108**  
**shunting fatality**  
**Middleton**  
**10 May 2000**

**Abstract**

On Wednesday 10 May 2000 at about 1130, while the Middleton yard shunt was propelling a rake of 5 wagons into the freight centre grid, the shunter fell under the leading wagon of the rake as he tried to board it and was killed instantly.

Safety issues addressed in the report are:

- the potential for inexperienced staff to be involved in shunting fatalities
- the lack of a support programme for newly qualified entrants into safety-critical areas such as the shunting environment
- the rostering process not recognising experience levels when grouping individuals into work groups in safety-critical areas
- the suitability of footsteps on over-width wagons.

Two safety recommendations were made to the operator.

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## List of Abbreviations

ASP	audio shunting procedures
km/h	kilometres per hour
LE	locomotive engineer
m	metre(s)
mm	millimetres
RCO	remote control operator
RO	rail operator
TXO	train examiner operations

## Data Summary

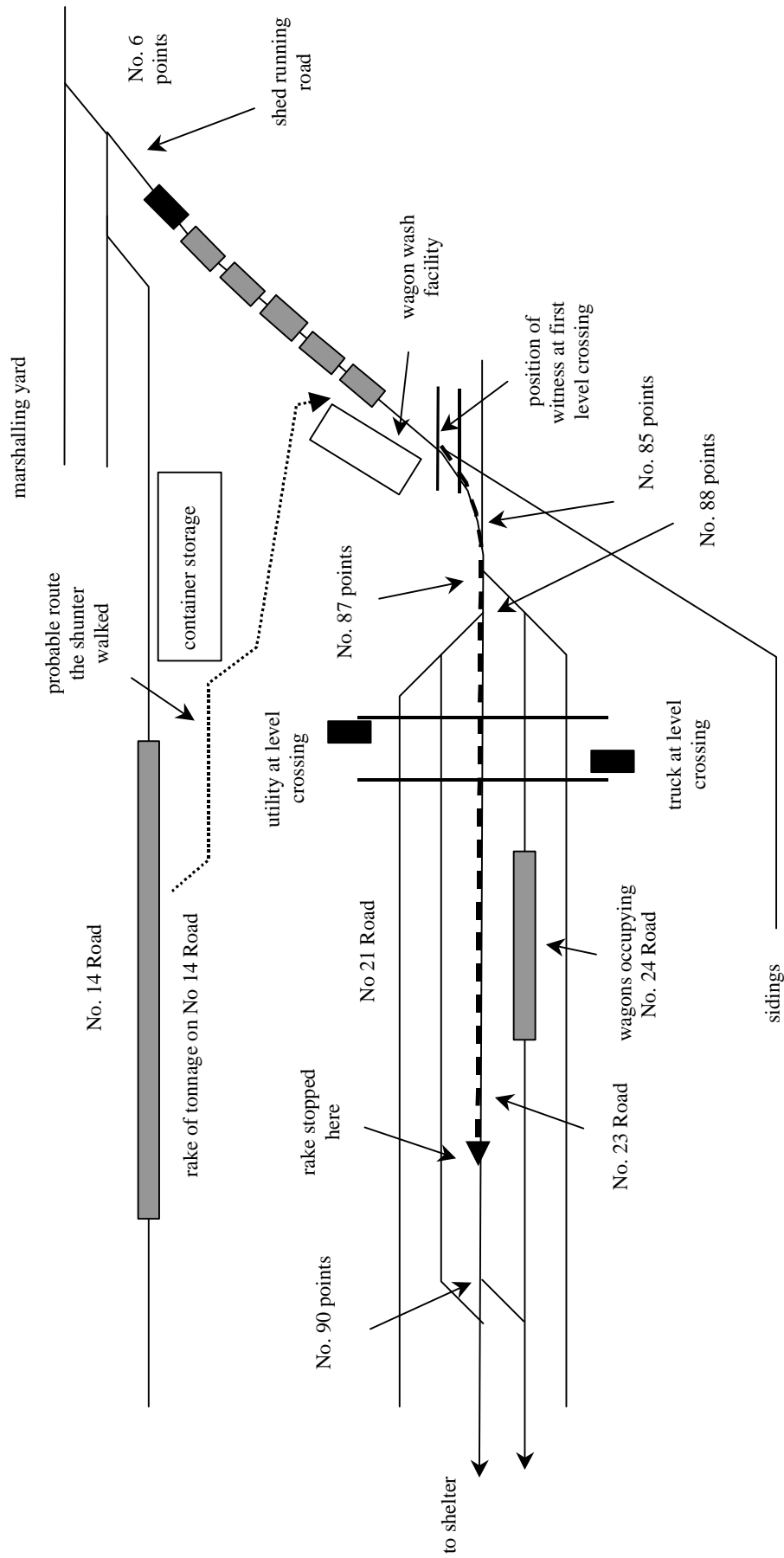
<b>Train type and number:</b>	Middleton yard shunt
<b>Date and time:</b>	10 May 2000, at about 1130
<b>Location:</b>	Middleton marshalling yard
<b>Type of occurrence:</b>	shunting fatality
<b>Persons on board:</b>	crew: 2
<b>Injuries:</b>	one (fatal)
<b>Damage:</b>	nil
<b>Operator:</b>	Tranz Rail Limited (Tranz Rail)
<b>Investigator-in-charge:</b>	D L Bevin



# **1. Factual Information**

## **1.1 Narrative**

- 1.1.1 On Wednesday 10 May 2000 the Middleton yard shunt was a rostered Tranz Rail shunting service which operated within Middleton marshalling yard and the Christchurch freight centre.
- 1.1.2 The yard shunt consisted of DSG3170, a remote-controlled locomotive operated by a remote control operator (RCO) and a 4-person gang consisting of a shunter, a train examiner operations (TXO), a wagon recorder and a trainee wagon recorder. At the time of the accident the TXO, wagon recorder and trainee wagon recorder were undertaking other duties as directed by the RCO and were not involved in the shunting at the Christchurch freight centre.
- 1.1.3 The RCO and shunter had broken up tonnage from a train which had earlier arrived in Middleton marshalling yard. Five wagons destined for No. 24 Road were cut out and left on the shed running road while the shunt positioned the other rake to No. 14 Road (refer Figure 1).
- 1.1.4 After the RCO and shunter had placed the rake to No. 14 Road the RCO returned alone with the locomotive to couple it to the rake of 5 wagons he had left standing on the shed running road. The RCO later stated that as he returned there he thought he had seen the shunter walking from No. 14 Road to meet him but he was not sure of this.
- 1.1.5 After coupling the locomotive to the 5 wagons the RCO walked towards the front of the rake. As he did so he saw the shunter some distance away and asked him by radio to get permission from the freight centre for the rake to enter No. 23 Road and through No. 90 points into No. 24 Road in the freight centre shelter. He also asked him to set the alarms going to warn the freight centre staff of the approach of the shunt. The shunter was equipped with 2 radios, one for communication with the RCO and the other to communicate with the freight centre team leader.
- 1.1.6 The RCO boarded the leading end of the second wagon from the head of the rake, a ZP class wagon. After the shunter advised him that the road was correctly set and they were “right to push in”, he commenced propelling the rake towards the freight centre grid.
- 1.1.7 The ZP class wagon on which the RCO was riding was narrower than the leading JPS wagon and restricted his vision but he thought the shunter was on the leading end of the wagon to keep a lookout where they were going.
- 1.1.8 The RCO estimated the speed of the rake at between 10 and 12 km/h along the shed running road as it approached No. 87 points which led to the freight centre grid. Witness statements put the speed of the rake at “walking pace”. The RCO stated he could not remember if the alarms were working as he approached the freight centre grid but later witness reports confirmed that they were.
- 1.1.9 A witness was standing at the first of 2 level crossings before the freight centre grid, waiting to cross the shed running road after the rake had passed. As the rake was approaching slowly he crossed before it reached the level crossing and as it passed he called a greeting to the person riding on the footstep at the front end of the leading wagon. The witness was employed by a sub-contractor to Tranz Rail and worked within the freight centre shelter and grid areas, and although he did not know him by name he recognised the person on the leading wagon as a shunter.



**Figure 1**  
**Plan of freight centre grid**



- 1.1.10 As the witness moved away from the track towards his light utility motor vehicle he saw a second person riding on the leading end of the second wagon of the rake on the same side as the shunter. He did not speak to this person but knew he was the RCO in control of the locomotive because of the remote control pack he was wearing on his chest.
- 1.1.11 The shed running road passed through No. 85 points which connected to another diverging road before reaching No. 87 points at the entrance to the freight centre grid which gave access to No. 23 Road (refer Figure 2).
- 1.1.12 No. 23 Road was described as a running road and provided access through the freight centre grid to No. 24 Road in the shelter via No. 90 points, which were located about 300 m along No. 23 Road and about 20 m outside the western entrance to the freight centre shelter.
- 1.1.13 A truck had stopped on the left-hand side of the second level crossing as the rake approached. The driver noticed a person, who he assumed to be the shunter, standing by a points lever near a set of points on the inside of the curve as the rake approached. He could not say whether he was standing by No. 85 points or No. 87 points as both were close to each other. The truck driver did not see anyone riding on the front of the leading wagon as the rake approached.
- 1.1.14 The truck driver looked away for a short time and when he looked back he saw the leading wagon of the rake entering the level crossing from his right-hand side, obstructing his view of where the shunter had been standing. As the rake passed in front of him he noticed what he thought was a piece of plastic being rolled over beneath the second or third wagon as the rake moved over the level crossing. After the locomotive at the rear of the rake had passed, what the driver had seen under the wagons was left in the middle of the level crossing and the driver realised it was a body.



**Figure 2**  
**No. 85 points foreground with No. 87 points immediately behind**

- 1.1.15 The truck driver immediately left his vehicle and ran to a Tranz Rail supervisor who was working nearby. He initially thought that the RCO had been run over and that the rake was moving out of control towards the shelter, but while he was telling the supervisor what had happened he saw the rake stop further up the track. The supervisor contacted the freight centre office to arrange for emergency services then ran to the level crossing.
- 1.1.16 Meanwhile, the witness who had earlier been standing at the first level crossing had entered his vehicle and driven it to the second level crossing and stopped opposite the truck, waiting for the rake to pass. As it crossed in front of him he too noticed something, this time under the fourth wagon from the head of the rake, but it was not until the locomotive had passed that he saw it was a body. He immediately drove to the freight centre to advise the team leader there of what had happened.
- 1.1.17 The RCO was aware that No. 90 points were not set for the intended move from No. 23 Road to No. 24 Road in the shelter, so as the rake approached this set of points he stopped and called the shunter by radio to set them for No. 24 Road in the freight shelter. The extra width of JPS317 immediately in front of the RCO restricted his line of sight forward and he was not able to see the front footstep where he expected the shunter to be riding. As he did not get a response he got down off the wagon on which he was riding and went to the front of the rake. When he found that the shunter was not there he turned around and started to walk back in the direction from which the rake had come. He had only walked a short distance when he became aware of the activity back along No. 23 Road and realised what had happened.
- 1.1.18 The RCO stated that he had not seen the shunter at all while propelling and did not know what his movements had been immediately prior to or during the movement. He had not seen the shunter alight from the rake or board it and had not had any radio contact with him since the shunter had relayed permission for them to enter the freight centre.
- 1.1.19 During the propelling movement the RCO had been conversing by radio with the “permission box” about a shunting service that was approaching from the main line to berth in Middleton marshalling yard. The RCO had instructed the “permission box” to berth the shunt in the south yard but the “permission box” had questioned this.

## **1.2 Site information**

- 1.2.1 The freight centre grid and shelter was a relatively new complex and had been in operation for about 18 months.
- 1.2.2 The approach to the freight centre grid on the shed running road was by a 150 m radius right-hand curve, which had a maximum permitted shunting speed of 25 km/h (refer Figure 3).
- 1.2.3 The freight centre grid was surrounded by an extensive area of tarseal and was used by the trucks and forklifts which serviced the loading and discharge roads. Designated areas of the sealed area between No. 21 Road and No. 14 Road were also used for container storage (refer Figure 1).

- 1.2.4 The rake was required to cross 2 level crossings as it approached the freight centre grid. Tranz Rail's documented procedures for the operation of the shunt warning devices stated that:

The shunt warning devices for the outside freight handling area consist of a series of flashing lights on the curb running parallel with the track. These lights are activated by selecting the zone to be shunted, using the channel switch on the ASP radio, then holding down the 'press to talk' switch on the radio for two seconds; on release the lights will then activate. Immediately return the radio to the correct operating channel. To turn the lights off repeat the 'turning on' process.

- 1.2.5 Underfoot conditions around the sets of points leading into the freight centre grid, and between the roads within the grid, were level and free of any obstructions or hazards.
- 1.2.6 The shunter was correctly attired for his duties, including high-visibility clothing and approved safety footwear.
- 1.2.7 The shunter's body was found between the rails of No. 23 Road in the centre of the level crossing about 10 m beyond No. 88 points.
- 1.2.8 There were scuff marks on the woodwork between the rails at No. 87 points together with a trail of personal effects from there into the freight centre grid, and the brake dust and dirt deposits on the leading end of the wagon, showed trails of finger marks beneath the horizontal handgrip in the centre of the wagon, which indicated that someone had tried unsuccessfully to obtain a handhold.

### **1.3 Rolling stock details and shunting procedures**

- 1.3.1 JPS317 was the leading wagon in the propelling movement. It had originally been a UN class flat deck wagon but had later been converted to a JPS wagon by the addition of a concertina style canopy (refer Figure 4).
- 1.3.2 The footstep at the leading end of the wagon where the shunter was standing was 18.5 mm thick and made of chequer plate with a textured surface to prevent slipping. It measured 280 mm x 180 mm and was mounted 685 mm above rail level. Tranz Rail advised that it was not the correct type of footstep for a JPS wagon as it projected straight out from the end of the wagon instead of dropping towards the track in an "L" shape configuration. At the time the JPS wagons had been produced the correct height-above-rail level for footsteps had been 563 mm. The fact that an incorrect footstep had been fitted to JPS317 was the reason why the height-above-rail level exceeded that standard by 122 mm. Although the footstep did not conform to height above rail standards for that class of wagon, the actual flat surface on which the shunter stood met all other Tranz Rail standards.
- 1.3.3 Tranz Rail has now established a new maximum height-above-rail level standard of 400 mm for footsteps (refer 4.3).
- 1.3.4 A horizontal handgrip attached to the centre of the wagon was positioned 1925 mm above rail level, which met Tranz Rail code requirements.
- 1.3.5 There was a handgrip attached near the side of the wagon to provide assistance to shunters when boarding, alighting or holding on while riding the wagon (refer Figure 5). The handgrip on the edge of the wagon was positioned 1090 mm from the centre of the wagon, 1695 mm above rail level, which met Tranz Rail code requirements.



**Figure 3**  
**Approaching the freight centre grid on the 150 m radius curve**



**Figure 4**  
**JPS class wagon**



**Figure 5**  
**The leading end of JPS317 showing footstep and handgrip**

- 1.3.6 The footstep was attached to the wagon directly above the rail and 164 mm from the outside edge of the wagon.
- 1.3.7 The handgrips and footstep were clean, free of any foreign materials, and in good condition.
- 1.3.8 The external width measurement of JPS317 from centreline was 1400 mm and the external width measurement from centreline of ZP10178, the wagon on which the RCO was riding, was 1236 mm (refer Figure 6).



**Figure 6**  
**Variation in widths between ZP10178 and JPS317**

- 1.3.9 Tranz Rail Operating Code Section 5 Operating Instructions for Yard Shunting and Allied Staff Instruction 3.1.1, which was in effect at the time, stated in part:

**3.1.1 Boarding, Riding On and Alighting from Moving Locomotives and Vehicles**

Observe these guiding principles when boarding, riding on and alighting:

**General Boarding and Alighting Instructions**

**Never attempt to get on or off a locomotive or vehicle which is travelling faster than walking pace.**

**Boarding:** facing the direction of travel, grasp the handrail firmly and step up and onto the riding position with the inside leg, maintain a firm handhold.

**Alighting:** Facing the direction of travel, step down and out with the outside leg, maintain a firm handhold until you are securely on the ground.

- 1.3.10 With remote control shunting the RCO was not required to maintain line of sight himself. The shunter could fulfil this role by using “audio shunting procedures” (ASP), whereby the 2 communicated by radio.

## **1.4 Personnel**

### **The RCO**

- 1.4.1 The RCO had been certified as competent to undertake his duties on 13 April 2000.

- 1.4.2 His work history before taking up RCO duties was:

October 1977	Junior porter
January 1978	Traffic operator
April 1983	Shunter
November 1990	Senior shunter
April 1997	Operations assistant
January 2000	Team leader

- 1.4.3 On 20 October 1999 the RCO, or operations assistant as he was then, was re-certified to perform train inspection duties (freight) and ASP shunting duties (freight).

- 1.4.4 For the 3 days prior to the incident the RCO had been rostered as follows:

- day 3 was a rostered day off
- day 2 he had worked 0800 to 1600
- day 1, the day before the accident, he had been rostered day off but had worked 1230 to 2030 at Tranz Rail’s request to cover a staff shortage.

- 1.4.5 The RCO had 11.5 hours off duty before commencing work at 0800 hours on the day of the accident.

### **The shunter**

- 1.4.6 The shunter was 43 years old and had been certified to undertake shunter’s duties on 28 April 2000.

- 1.4.7 His work history before taking up shunters’ duties was:

December 1972	Junior porter
July 1975	Traffic assistant
April 1977	Shunter
February 1981	Signalman
June 1984	Senior signalman
December 1993	Wagon recorder

- 1.4.8 He had completed nearly 13 years in signal box duties in Christchurch signal box when it was closed with the shift of its signalling function to Addington signal box. At that point he took a position as a wagon recorder. A family member stated that the shunter had been offered a position in the Addington signal box but had declined that because he did not want to learn a different signal box operation.

- 1.4.9 On 22 October 1999 the shunter successfully completed a practical assessment and competency test for a licence to perform shunting duties. This licence enabled him to commence on-the-job training in shunting duties in preparation for his final competency certification. He was issued with his certificate of competency for shunting duties on 28 April 2000. This final certification included a practical assessment of the shunter's ability to competently perform the duties of the role. A Practical Assessment and Mastery Test for Licence to Perform shunting duties was undertaken by an appropriate member of the terminal manager's staff and signed off in accordance with certification procedures.
- 1.4.10 Detailed records of compliance monitoring and on-the-job assessments of the shunter were provided by Tranz Rail.
- 1.4.11 Over the 3 days prior to the incident the shunter had been rostered and worked as follows:
- day 3 was a rostered day off
  - day 2 he worked 0800 to 1600
  - day 1, the day before the accident, was a rostered day off.

On the day of the accident the shunter was rostered 0800 to 1600.

- 1.4.12 His earlier shunting experience was between 1977 and 1981 during which time he worked in the Addington passenger yard, the old Christchurch station and the freight centre. There had been major changes in the shunting environment since 1981, the most significant being the introduction of ASP into Middleton marshalling yard in 1990 and the introduction of remote control shunting operations into Middleton in 1995.

## **1.5 Other relevant shunting fatalities investigated by the Commission**

### **Q2 shunting service at gracefield rail occurrence report 95-111**

- 1.5.1 In May 1995 a rail operator (RO) was riding on the leading wagon of a rake and was killed instantly when he fell under the shunt during a propelling movement. Safety issues addressed in the report included the training and certification of operating staff.
- 1.5.2 After 7 years in the locomotive operating field the locomotive engineer (LE), as he was then, became involved in the shunting environment with his training and certification as a train operator. This gave him some experience in shunting but primarily in the placing and lifting of wagons to and from sidings.
- 1.5.3 A finding in this report was:

- 3.18 Supervision and compliance monitoring following the training and certification of the newly appointed and relatively inexperienced RO failed to detect or correct his reported common use of kick shunting, including non-compliant procedures.

### **Pilot fell from locomotive Westfield Occurrence Report 96-109**

- 1.5.4 In June 1996 a locomotive depot staff member in Westfield fell from the front cowcatcher step while piloting a DFT locomotive when the brakes were applied and he was run over by the locomotive cowcatcher. He later died from his injuries.
- 1.5.5 A safety issue discussed in this report was the 2 inexperienced depot staff members working together.



1.5.6 A finding in this report was:

3.8 Inexperience on the part of the pilot was probably a contributing factor.

### **Shunter fell from wagon Palmerston North Occurrence Report 96-115**

- 1.5.7 In September 1996 a P35 shunt operated by Tranz Rail was shunting at Palmerston North yard. During a propelling movement into a private siding the shunter fell in front of the leading wagon of the rake and was killed instantly.
- 1.5.8 The shunter was 45 years old and had been employed by Tranz Rail for 12 months. He had been certified for shunting duties for 9 months at the time of the accident.
- 1.5.9 Section 4.2 of this report said that in the case of newly appointed and relatively inexperienced staff the use of non-compliant practices has a greater probability of leading to an accident. A more continuous compliance monitoring regime for these staff would assist in reducing this probability. An appropriate regime for the Palmerston North area may be to form a “shunting review group” made up of senior experienced staff who meet at regular intervals to assess the day-to-day actions of newly appointed staff rostered to work with them.
- 1.5.10 The Commission recommended that the managing director of Tranz Rail Limited formally structure compliance monitoring for newly appointed staff to include input from experienced shunting staff where appropriate.

## **2. Analysis**

### **2.1 The shunter**

- 2.1.1 The exact movements of the shunter after the rake of wagons was placed to No. 14 Road are not known but from witness accounts it is likely that he walked from No. 14 Road across the sealed area between the container stacks to where the rake was standing on the shed running road. He did this while the RCO travelled from No. 14 Road to the shed running road on the locomotive.
- 2.1.2 Before the shunter joined the rake he was asked by the RCO to get permission for the shunt to enter the freight centre and place wagons to No. 24 Road inside the shelter and also to activate the alarms. After getting this permission the shunter advised the RCO that the road was set and that they were “right to push in” and climbed on to the leading end of the front wagon of the rake as the RCO commenced the propelling movement towards the freight centre grid. He was seen in this position by the first witness.
- 2.1.3 As the rake approached the freight centre grid the shunter appears to have dismounted and run ahead of the rake. He was seen standing next to either No. 85 or No. 87 points by the second witness. Why the shunter alighted the rake and ran ahead could not be determined. He had already confirmed that the road was correctly set and his comment “right to push in” indicated that he had already started the alarms before he boarded the rake. It is possible that he wished to get a better angle of sight to check that the alarms were operating. From his position on the wagon, many of the alarm light units would have been obscured by their protective covers.

- 2.1.4 The RCO could not remember if the shunter had accompanied him on the previous trip to the freight centre shelter but as he was the designated shunter in the 5-person gang, it was reasonable to assume that he had. That being so the shunter would have been aware that No. 87 points were set for No. 23 Road after they had last vacated the freight centre grid and that this setting was customary. The view from his position at the front of the leading wagon would have allowed him to check the setting of the route without having to dismount.
- 2.1.5 Tranz Rail's procedures in place at the time allowed for shunting personnel to board and alight from moving vehicles provided the speed did not exceed walking pace. There is no evidence to suggest that the rake was moving in excess of walking pace either at the time the shunter alighted or at the time it is thought he attempted to re-board it.
- 2.1.6 The shunter's relative inexperience was highlighted by his action in alighting from the rake after telling the RCO that the road was set and they were right to push in. If it had become necessary for him to alight for any reason he should have advised the RCO before doing so, as the RCO could have accelerated the shunt up to 25 km/h at any time.
- 2.1.7 Scuffmarks on the woodwork between the rails at No. 87 points, together with the scattering of personal effects from there into the freight centre grid indicated that the shunter had fallen at that point. It appears most likely that the shunter had attempted to board the rake a short distance before No. 87 points, probably at No. 85 points where the shed running road straightened up as it joined the other diverging road.
- 2.1.8 The shunter had probably grabbed the handgrip with his left-hand and put his left foot on the footstep in preparation for boarding the wagon. The height of the footstep was about 700 mm allowing for about 15 mm above rail height and, as the shunter was of average height, a step of this magnitude would have required him to launch off the ground with his right leg and pull up with his left arm simultaneously. The jerk of the wagon as it straightened may have caused him to overbalance beyond the footstep and towards the centre of the wagon. A natural reaction would be for him to throw out his right-hand in an attempt to grab the horizontal handgrip in the centre of the wagon to stop his fall. The finger mark trails in the dirt below the horizontal handgrip suggest that he missed it and fell under the wagon as it moved over No. 87 points.
- 2.1.9 Had the footstep been at the new maximum height of no more than 400 mm above rail height, the task of boarding the wagon would have been safer.
- 2.1.10 The footstep and the handrail being positioned 164 mm inside the outer edge of JPS317 could also be detrimental to safety. The shunter would have had to place his foot and reach with his hand inside the line, or in the path of the oncoming wagon, making it more difficult to pull out of the manoeuvre for any reason. The combination of the position and height of the footstep on the wagon in this case placed the shunter at greater risk.
- 2.1.11 Although the footstep on JPS317 was not the correct one and did not meet the standard for that particular class of wagon, it was within the specifications of other wagons within the fleet so it was not an unusual fitting. The flat area of the footstep was clean and free of any materials and met size requirements.
- 2.1.12 Although the shunter had been involved in shunting earlier in his career, this experience would have been of limited value when he returned to shunting duties in April 2000. Between 1981 when he left the yard and went to the signal box and his return in April 2000 there had been many changes such as ASP and remote control shunting, of which the shunter had no previous experience.
- 2.1.13 After leaving the signal box the shunter had gained experience at moving around the marshalling yard in his role of wagon recorder but this did not require him to board or alight from moving wagons.

- 2.1.14 The shunter had gone through the required training programme prior to being certified to perform shunter's duties. His training had included theory tests as well as practical on-the-job exercises while being assessed by staff training personnel. Based on documented results and comments from staff training and supervisory personnel there was no doubt that the level and quality of training were such that the shunter was adequately prepared for his role at the time he was certified.

## **2.2 The RCO**

- 2.2.1 When the RCO was advised by the shunter that the road was set and they were right to push in he started the propelling movement. He understood from this that they had permission to enter the freight centre, the alarms were operating, the road was correctly set and the shunter was in position on the front of the leading wagon. He did not expect to stop again until they reached No. 90 points, which he knew were set for No. 23 Road in the shelter and needed changing to allow the rake to access No. 24 Road in the shelter. The position the RCO took up on the rake did not offer full visibility ahead but was normal practice when working ASP and was consistent with the Tranz Rail code. The RCO's assumptions and actions were reasonable based on the information he had been given by the shunter.
- 2.2.2 While the propelling movement was taking place the RCO's attention had been diverted to talk to the "permission box" about the berthing of an incoming shunt service. During this discussion he would not have consciously looked for the shunter as he was satisfied he was on the front of the leading wagon and the width of JPS317 immediately in front of him restricted his visibility anyway. The width of JPS317 meant that he would not have been able to see the shunter even if he had leaned well out from the wagon because the footstep on which the shunter was standing was positioned well inside the side of the wagon.
- 2.2.3 The shunt was travelling under the maximum allowable speed of 25 km/h and was being correctly operated by the RCO. Independent witnesses confirmed that the speed was at or close to walking pace and did not increase significantly during the entire movement.
- 2.2.4 The lack of communication between the RCO and the shunter after the rake moved across No. 87 points and on to No. 23 Road would not be unusual for an experienced shunting team. The RCO knew that the road ahead was clear and as he was required to stop at No. 90 points he had the rake under sufficient control to do so. He was satisfied that the shunter was aware of what they were doing so there was no reason to communicate with him and he thought that the shunter would call him by radio if there was any requirement for him to stop enroute. An experienced RCO, however, may not have taken all these points for granted knowing that the shunter was inexperienced. Conversely, an experienced shunter might communicate more if working with an inexperienced RCO.
- 2.2.5 The RCO was so sure that the shunter was at the front of the rake that when he got no response from his radio request regarding the setting of No. 90 points he immediately went to the head of the rake where he expected the shunter to be.

## **2.3 General**

- 2.3.1 A study of shunting fatalities in marshalling yards in the United States of America carried out by the National Transportation Safety Board in 1999 identified a trend of increasing fatalities amongst newly qualified but inexperienced shunting staff. The database available in New Zealand is too small to confirm a similar trend but shunter inexperience was a contributing factor to all of the accidents referred to in this report.

- 2.3.2 Tranz Rail did not have a policy to ensure that recently certified but inexperienced staff only worked with more experienced personnel immediately following their certification. The value of such a programme was reflected in Westfield where a local policy was in effect under which the 2 locomotive depot staff members had been separated after training and certification and each had been put with a more experienced staff member to act as a coach for ongoing training. However, because of rostering requirements the 2 inexperienced people came together for 5 days, 4 of which had been completed safely before the accident.
- 2.3.3 The rostering process within marshalling yards does not recognise experience levels when grouping individuals into shunting gangs. A safety recommendation has been made in section 5 of this report to address this issue.

## **2.4 Other relevant shunting fatalities investigated by the Commission**

- 2.4.1 Three other fatal shunting accidents which have occurred since May 1995 have been investigated by the Commission. In each case it was found that the staff involved were inexperienced either as a result of being recently employed by Tranz Rail or through changes in jobs to meet organisational changes within the company.
- 2.4.2 At Gracefield the RO had been certified as a shunter 4 months before the incident. Prior to becoming an RO he had been a Grade 2 LE, then a guard, then a train operator when the use of guards was discontinued. His advancement to RO with shunting responsibilities at Gracefield came about with the removal of permanent shunting staff from Gracefield and the transfer of Gracefield shunting responsibilities to suitably qualified staff from Wellington.
- 2.4.3 At Westfield both the pilot and the locomotive driver had only had 3 months' experience each and their time working together was limited to the 4 days prior to the accident. Before that they had been regularly rostered with a more experienced colleague. They were employed as casuals from an external employment agency and were waiting for vacancies in Tranz Rail's permanent staff at the time of the accident.
- 2.4.4 At Palmerston North the shunter had been employed by Tranz Rail for 12 months prior to the incident and had been certified as a shunter for 9 months.

## **2.5 Summary**

- 2.5.1 The length of time the staff involved had been certified to undertake their respective roles varied from 3 months to 10 months.
- 2.5.2 The need for staff to often change roles and learn new duties during their careers had been driven by the changing business environment within Tranz Rail. These changes resulted in a redistribution of workload and tasks amongst the remaining staff and a requirement for retraining to equip people with the necessary skills for their new roles. Such initiatives are not uncommon and in this particular incident the affected shunter had been given sufficient training for his new role.
- 2.5.3 Personnel with less than one year of service in the company or less than one year of service in a new role, particularly in safety-critical areas such as the shunting environment, must have special attention paid to safety awareness, service qualifications, on-the-job training and overall ability to perform their tasks safely and efficiently. Programmes such as peer review, mentoring and supervisory observation need to be available and utilised to reinforce this. Additional on-the-job training and experience, while working with more experienced peers, may help reduce fatalities among employees with limited service in their role.

### 3. Findings

Findings and safety recommendations are listed in order of development and not in order of priority.

- 3.1 The RCO had been certified for remote control operations for 4 weeks and the shunter had been certified for shunting duties for about 2 weeks at the time of the accident. This is another example of a shunting fatality involving inexperienced staff.
- 3.2 The shunt was proceeding at about walking pace when the accident occurred.
- 3.3 The shunter probably alighted from the head of the rake and then fell under it as he was trying to re-board a short time later. The reason for his alighting the shunt was not determined.
- 3.4 Alighting and boarding wagons moving at or below walking pace was allowed under Tranz Rail's rules at the time of the accident.
- 3.5 The shunter was appropriately attired and neither the condition of the yard area nor environmental factors are likely to have contributed to the accident.
- 3.6 The height of the footstep above the ground and its position inboard of the edge of the wagon meant it was not fit for purpose and may have contributed to the shunter's fall.
- 3.7 The wagon the shunter was trying to board may have lurched as it came off the curve and through the points, throwing the shunter off-balance as he was boarding.

### 4. Safety Actions

- 4.1 On 17 May 2000 Tranz Rail issued Bulletin No. 290 which stated in part:

Commencing forthwith and continuing until further advised the following instructions will operate. The relative Rail Operating Code instructions are modified accordingly.

**BOARDING AND ALIGHTING ALL MOVING RAIL VEHICLES IS PROHIBITED**

Referring to Section 5 Operating Instructions for Yard Shunting and Allied Staff.

**3.0 SAFETY**

**3.1 Safe Shunting Practices (additional instruction)**

- **Boarding And Alighting From All Moving Rail Vehicles Is Prohibited**  
Staff **must** only board or alight rail vehicles when the movement is stationary (stopped)

**Exception:** Staff may alight from a moving rail vehicle in an emergency if personal safety is endangered.

**3.1.1 Boarding, Riding On and Alighting from Moving Locomotives and Vehicles (additional instruction)**

The reference to boarding and alighting from moving rail vehicles in various paragraphs of this instruction no longer applies as this practice has been **PROHIBITED**.

- 4.2 This instruction was included in Issue 4 of Tranz Rail's Operating Code Section 5 Operating Instructions for Yard Shunting and Allied Staff Instruction 2.1 Personal Safety dated 16 October 2000. In view of this safety action no recommendation was made regarding the continued practice of staff boarding and alighting moving wagons.
- 4.3 Following the Ministerial Inquiry into Tranz Rail Occupational Health and Safety, Tranz Rail has set up an Executive Health and Safety Committee with Health and Safety Action Teams. The structure of this organisation is attached as Appendix A.
- 4.4 Tranz Rail advised that historically footsteps had been fitted relative to the wagon and not to a ground feature, which meant that there was inconsistency in the heights of footsteps on various classes of wagons. A programme to standardise all footsteps to a maximum height of 400 mm above rail level was now in progress. As well, Tranz Rail advised that it had produced a new "ergonomic" footstep and was progressively introducing these to the wagon fleet. JPS317 had since been fitted with the newly designed footstep at 400 mm above rail level as part of this programme.
- 4.5 Tranz Rail advised that it is currently reviewing the practice of allowing shunting staff to ride on over-width wagons to determine if such wagons should be fitted with footsteps. If the review determines this practice is no longer appropriate the footsteps on wagons deemed as over width may be removed. The Commission considers the boarding of footsteps not positioned on the outer edge of the wagon to be inherently dangerous. However the safety action by Tranz Rail in prohibiting the practice of boarding and alighting from moving vehicles will significantly reduce this potential risk. In view of this action and those included in 4.3 above no safety recommendations regarding footsteps have been made in this report.

## **5. Safety Recommendations**

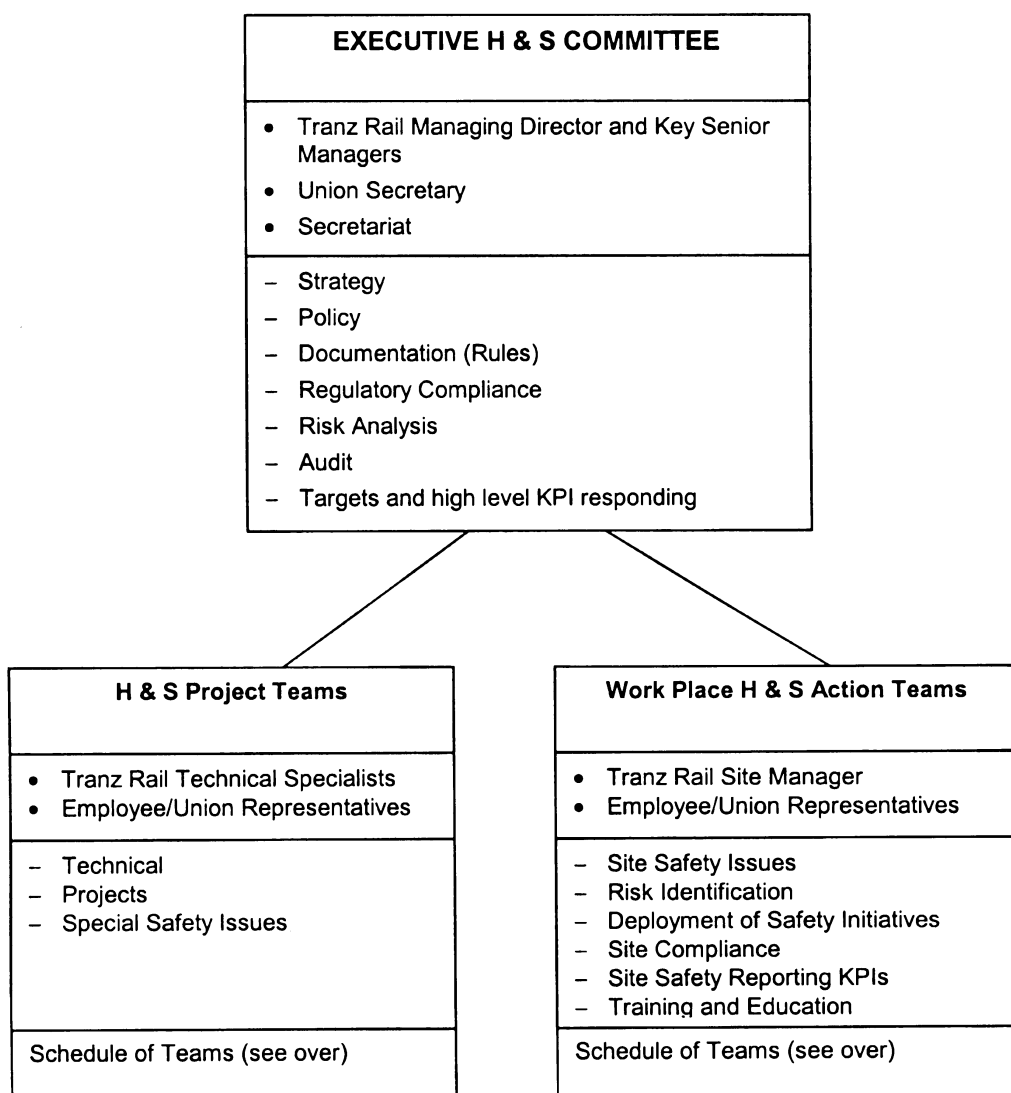
- 5.1 On 30 January 2001 it was recommended to the managing director of Tranz Rail that he:
  - 5.1.1 develop and implement a support programme for newly qualified entrants to jobs in safety-critical areas, such as the shunting environment, focusing on ongoing safety awareness, on-the-job training and ability to perform tasks to include such initiatives as peer review, mentoring and supervisory observation (133/00)
  - 5.1.2 develop and implement procedures to ensure that personnel with less than 6 months experience in roles in safety-critical areas, such as the shunting environment, are not rostered to work together as part of the same work group. (134/00)

Approved for publication 24 January 2001

Hon. W P Jeffries  
**Chief Commissioner**



## TRANZ RAIL EXTERNAL HEALTH AND SAFETY ORGANISATION



- OBJECTIVE:**
- Tranz Rail Strategic Plan safety objectives – Balanced scorecard, including 50% reduction in LTIs by end 2002. Zero fatalities.
  - Rayner Report recommendations
  - Commission of Inquiry recommendations

- APPROACH:**
- Proactive continuous improvement lead by MD but driven into the workplace by site management working with employees and workplace Health and Safety Action Teams.