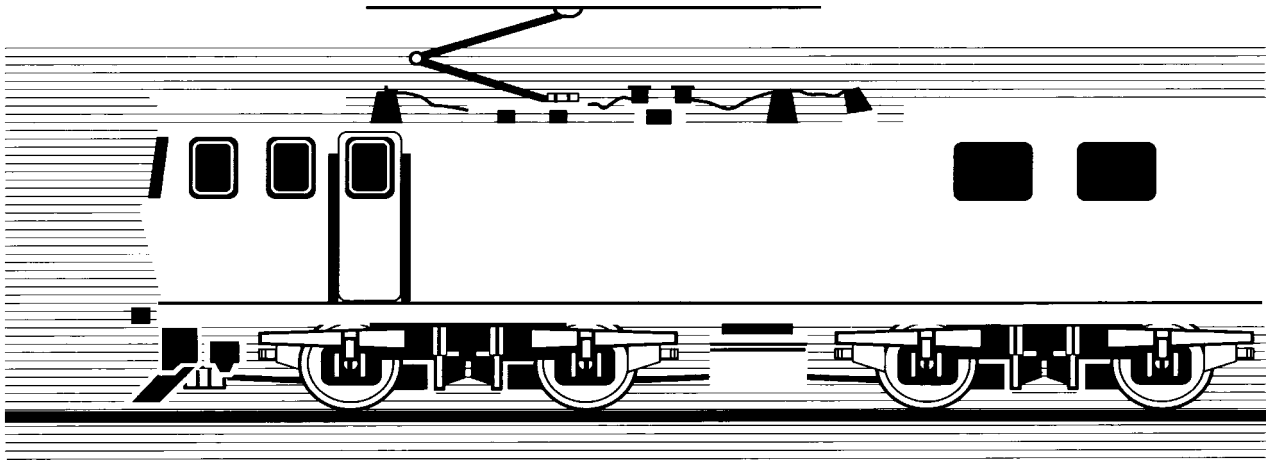
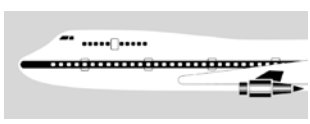
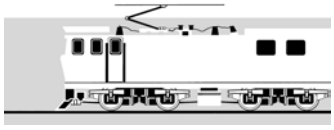


RAILWAY OCCURRENCE REPORT

02-114 Electric Multiple Unit Train 2643, passenger fell from stationary train, Silverstream 12 June 2002


TRANSPORT ACCIDENT INVESTIGATION COMMISSION
NEW ZEALAND

The Transport Accident Investigation Commission is an independent Crown entity established to determine the circumstances and causes of accidents and incidents with a view to avoiding similar occurrences in the future. Accordingly it is inappropriate that reports should be used to assign fault or blame or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The Commission may make recommendations to improve transport safety. The cost of implementing any recommendation must always be balanced against its benefits. Such analysis is a matter for the regulator and the industry.

Report 02-114

Electric Multiple Unit Train 2643

passenger fell from stationary train

Silverstream

12 June 2002

Abstract

On Wednesday 12 June 2002 at about 1308, a partially-sighted passenger fell from the doorway of Train 2643 while alighting at Silverstream. The train, an Upper Hutt to Wellington Tranz Metro[1] electric multiple unit service, had stopped at the platform but the last doorway of the rear passenger car, from which the passenger fell, was positioned off the north end of the platform.

The passenger suffered serious injuries that required hospital treatment.

The safety issue identified was the berthing of electric multiple unit passenger services at suburban stations.

As a result of the actions taken by the operator following this and a similar occurrence, no safety recommendations are included in this report.

[1] Tranz Metro was the group in Tranz Rail with responsibility for the operation of suburban train services in Wellington.

Contents

Abbreviations ii

Data Summary iii

1 Factual Information 1

1.1 Narrative 1
1.2 Site information 1
1.3 Personnel 4
The EMU driver 4
The training consultant 5
The guard 5
The passenger 5
1.4 Staff 6
1.5 Other incidents where EMUs stopped short of platforms 7
Redwood 13 June 2002 7
Redwood 5 November 2002 8
Wallaceville 5 November 2002 8
Redwood and Porirua 19 November 2002 8

2 Analysis 9

Silverstream 9
Other incidents 9

3 Findings 10

4 Safety Actions 10

Figures

Figure 1 The position of the train when it was stopped at Silverstream. The passenger fell from the nearest door 2

Figure 2 Plan of Silverstream station (not to scale) 3

Figure 3 The north end of Silverstream platform 4

Abbreviations

EMU	Electric Multiple Unit
mm	millimetre(s)
Tranz Rail	Tranz Rail Limited

Data Summary

Train type and number:	Electric Multiple Unit Train 2643
Date and time:	12 June 2002 at about 1308
Location:	Silverstream
Persons on board:	crew: 2 passengers: About 145
Injuries:	crew: nil passengers: 1 serious
Damage:	nil
Operator:	Tranz Rail Limited
Investigator-in-charge	D L Bevin

1 Factual Information

1.1 Narrative

1.1.1 On Wednesday 12 June 2002, Train 2643 was the scheduled 1300 passenger service from Upper Hutt to Wellington. The train was an electric multiple unit (EMU) and consisted of 2 ET Class non-powered passenger cars and 2 EM Class motor-powered passenger cars.

1.1.2 Train 2643 was crewed by an EMU driver, accompanied by a Tranz Rail training consultant who was undertaking a safety observation of the driver, and a guard. The driver and the guard had both commenced their shifts at Upper Hutt prior to operating Train 2643. The training consultant had earlier travelled from Wellington to Upper Hutt on another EMU service with a different driver.

1.1.3 The train was usually a 2 car set, but had been increased to 4 cars to accommodate a school party of about 130, including supervising adults, who were to travel from Trentham to Waterloo on the service. The guard had been made aware of this when he commenced his shift at Upper Hutt about 10 minutes before the departure of the train.

1.1.4 After departing from Upper Hutt, the guard had advised the driver about the school party and asked him to "pull up short" at Wallaceville and "long" [2] at Trentham. After departing from Trentham the guard then asked the driver to "pull up short" at Heretaunga and Silverstream.

1.1.5 On arrival at Silverstream, the driver had stopped the train with his cab opposite the passenger shelter, and the guard opened the doors from the door control box at the front door of the leading car.

1.1.6 Once the doors were opened, a partially-sighted passenger, who was travelling alone in the last car, gathered her belongings and grasping the right hand rail for assistance, stepped out of the doorway. She fell about 930 mm to the ground and landed on her feet between the train and a barrier. The barrier, constructed of railway iron, was intended to prevent pedestrian access to the track from the ramp at the end of the platform (see Figure 1). Her left leg was hard against the barrier.

1.1.7 A person who had been on the platform and saw her distress went to her assistance. She said she was alright, so he went back up the platform. His identity was not established. The passenger then climbed over the barrier and left the station via the public access way. As she walked she began to hyperventilate and thought she was going into shock, so she went to a pharmacy near the station and sought assistance. She was taken to a doctor in the immediate vicinity for treatment.

1.1.8 After the guard opened the doors he stepped on to the platform to observe the passengers boarding and alighting from the train. He recalled that he looked to the rear of the train and thought he had seen 2 people standing on the platform near the last car. He became aware that the rear of the train may have stopped short of the platform but he was not sure, so he started to walk towards them but they separated and started to walk away. The other passengers who alighted had dispersed and there was nothing to indicate to him that anything was wrong, so he went back to the train and the service continued to Wellington.

1.2 Site information

1.2.1 Silverstream was an island platform station with the up main line and the down main line on either side. There was a passenger shelter positioned about 70 m from the north end of the platform (see Figure 2).

[2] Berthing at platforms to position carriages for the convenience of boarding and alighting passengers.

Figure 1
The position of the train when it was stopped at Silverstream.
The passenger fell from the nearest door.

1.2.2 Pedestrian access to the station was from the north via a public access way that went from the end of the platform and between the main lines for a distance of about 60 m to where it branched left and right through protected pedestrian level crossings over the respective main lines (see Figure 3).

1.2.3 The down main platform had marks painted on the seal that indicated distances for 4 and 6 car trains to assist EMU drivers when berthing at the platform. The 4 car mark was positioned 130 m from the north end of the platform and about 50 m beyond the passenger shelter. In common with other suburban stations, the platform markers were for the guidance of drivers, rather than mandatory stopping positions.

1.2.4 A 4 car EMU set is about 86 m long. The front of Train 2643 had stopped about 4 m short of the south end of the platform shelter and about 56 m short of the 4 car marker. As a result, the last car overhung the end of the platform by about 10 m, with the rear door being short of the platform.

1.2.5 From the north end of the platform a barrier constructed from a piece of railway iron stretched about 4 m to join with a mesh fence (see Figure 1). Its purpose was to prevent members of the public access from the platform to the railway line.

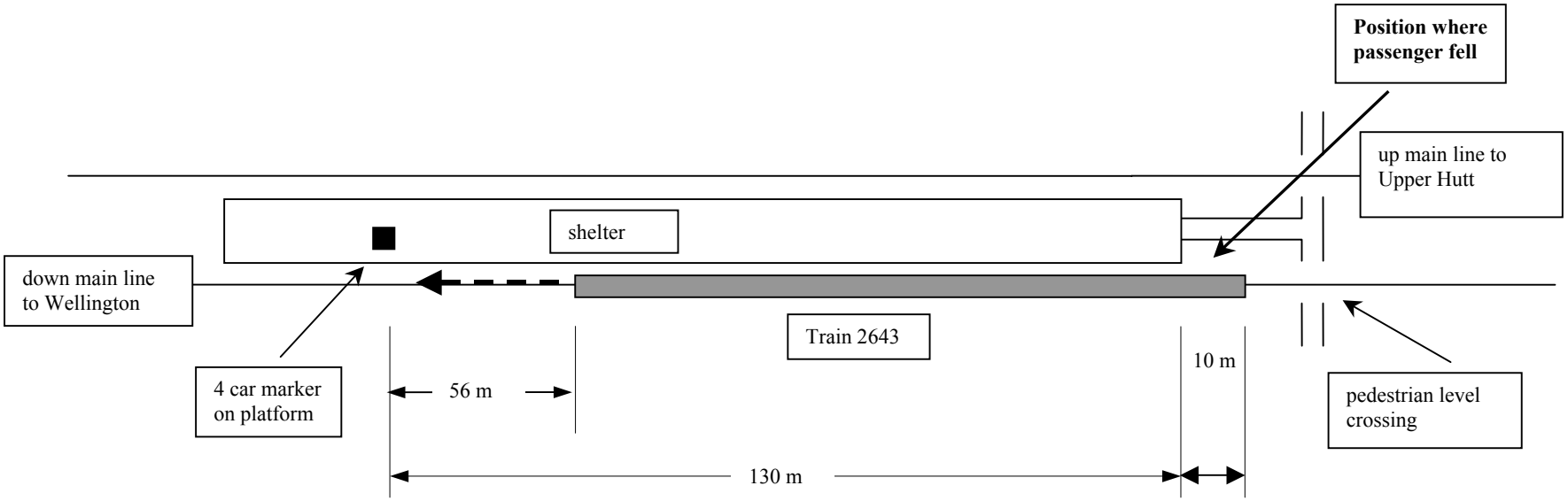


Figure 2
Plan of Silverstream station (not to scale)

Figure 3
The north end of Silverstream platform

1.3 Personnel

The EMU driver

1.3.1 The EMU driver had worked for Tranz Metro for about 5 years, the last 3 as a driver. He conversed regularly with the guard as they travelled from Upper Hutt and was aware of the guard's requirements regarding stopping positions at various stations.

1.3.2 The driver said that on arrival at Silverstream he stopped the train with his cab just past the passenger shelter and that he was unaware that passengers were alighting from the last car. He later recalled that, given the position in which he had stopped, it was possible that the rear door of the last car could have been slightly on the ramp of the platform, but he had not looked out of his cab at the time to check this. He believed that the only occupants of the last 2 cars were the school party who were to alight at Waterloo.

1.3.3 The driver did not know that a passenger had fallen from the train until he was told by Tranz Metro management the following day.

The training consultant

1.3.4 The training consultant had been employed by Tranz Rail for about 21 years and was a certified grade 1 locomotive engineer and qualified EMU driver. He had been involved in staff training since 1997, and in 2000 became a full-time trainer, concentrating more recently on the training and certification of EMU drivers. On the day of the accident he was conducting a safety observation to check the progress of the EMU driver, who he had previously trained. Although safety observations such as this were not normally part of his role, he was qualified to undertake them.

1.3.5 The training consultant confirmed that the marks painted on the platform were an indicator only for the EMU drivers and were not mandatory stopping places. However, he observed that most drivers did use them to position their cab when stopping. There was no reference to the use of the markers on the observation check sheet. He had been unaware that the EMU had stopped short, but recalled looking out the window and seeing the shelter. He could not remember exactly where the train stopped because he was observing the driver's train handling techniques bringing the train to a stop.

1.3.6 The training consultant did not know a passenger had fallen from the train until he was told by Tranz Metro management the following day.

The guard

1.3.7 The guard had been employed by Tranz Rail for about 4 years. He had started as a part-time ticket assistant and progressed through to the role of guard. He had been certified as an EMU driver in December 2001 but had reverted to guards' duties about one week prior to this accident. This was his third shift back as a guard.

1.3.8 The guard did not have any additional staff on the train to help with the school party, so he planned to put the group in the rear 2 cars, leaving the front 2 cars for other passengers. Before the train departed from Upper Hutt he told those passengers in the rear 2 cars about the group joining the train at Trentham, and suggested they might like to move forward to the front cars "if they wanted to travel in peace and quiet". Most of the passengers moved.

1.3.9 The guard said he had been unaware of the presence of a partially-sighted passenger on the train although he had clipped her ticket prior to departure from Upper Hutt. He could not recall what type of ticket she had been travelling on, but was sure that the passenger had not shown him her concession identification card when he had clipped her ticket. He said that it was not unusual for him not to sight such concession cards as they were normally shown at the ticket office when tickets were purchased.

1.3.10 The school party boarded the train at Trentham. They travelled on one ticket for the whole group so the guard clipped the ticket before the train departed from Trentham. At every station when the guard operated the train doors, the doors in the passenger cars in which the school party travelled also opened. From previous experience he was aware of potential behaviour problems from a large group of children travelling together but said that because he was by himself, he could do nothing to supervise them. He could have isolated the doors of those cars to keep them closed during station stops while en route to Waterloo, but this practice was not encouraged in case an emergency evacuation of the train was necessary.

The passenger

1.3.11 The passenger was an experienced rail user, both in New Zealand and overseas. She travelled extensively on suburban train networks and relied on them as her main means of transport. Her ability to do this was based largely on her confidence in the consistency of stopping positions at stations. She always rode in the rear car when travelling from Upper Hutt to Silverstream for convenience when alighting at her station.

1.3.12 The passenger had boarded the last car through the rear door as soon as the train had berthed in the dock[3] at Upper Hutt, and was seated when the guard later entered through the same door and clipped her ticket before the train departed. She was not advised of a school party which was boarding the train at Trentham and was not aware of them until they boarded her car.

1.3.13 In accordance with Tranz Rail's procedures, the passenger's 10-trip concession ticket had been endorsed "Blind Pass No…" at the time of purchase, and when she had presented it to the guard she remembered also showing him her blind concession card ID. This was a practice she had recently started after another guard asked to see it when she presented her suitably endorsed ticket. The ID card was verification that she was entitled to travel on a concession ticket.

1.3.14 Six days after her fall from the train, the passenger travelled by bus from her home to Silverstream to catch a train to Wellington. After she had alighted from the bus and was walking towards the railway station, she heard a snap and fell. Two people came to her assistance and stayed with her until a doctor arrived. At first it was thought her leg was broken and she was taken into the doctor's surgery to wait for an ambulance.

1.3.15 Medical reports later showed that the passenger had sustained an undisplaced fracture of her lower leg in the fall from the train and the fracture became suddenly displaced when her leg gave way 6 days later. The unusual nature of the fracture meant that she had been able to continue walking, although with some difficulty and pain. Although not life-threatening, the injury was serious enough to have caused her to be hospitalised for 6 days and some significant disability for several months. Her recovery was not complete at the time of publication of this report. Her fall from the train could have resulted in more serious injuries, especially if her head had hit the ground or the barrier.

1.4 Staff

1.4.1 Tranz Rail advised that the staffing policy for Tranz Metro EMU services was:

> Additional staff are rostered to our busier services to do the following:
>
> - Assist the Guard to give right-of-way at stations, thereby helping services to run to time
> - Collect fares
> - Provide assistance to passengers
>
> There are a number of factors that are taken into consideration when adding a second person:
>
> - Number of carriages
> - Number of passengers
> - Distances between stations
> - Express vs stopping all stations services
> - Number of regular passengers with monthly tickets
> - Number of passengers already ticketed before boarding (eg after Stadium events, school group bookings)
> - Number of passengers likely to need assistance
>
> For example, we operate off-peak services on the Upper Hutt line with 2 carriages and a second person between Taita and Wellington, because:
>
> - The short distances between stations
> - The number of passengers travelling short distances and paying in cash

[3] The dock is a small no-exit platform in which terminating services can be berthed.

Re the incident in question, a second person was not assigned because the large school group was pre-ticketed, and was being accompanied.

We emphasise to staff the first responsibility of train crews is to follow company procedures that ensure the safety of passengers. Tranz Rail supports and champions the safe operation of door systems to approved procedures. At all times safe train operation takes precedence over the need to collect fares.

In order to do this, we require staff on-board services to do the following when passengers are alighting / boarding at stations:

- Think safety first; i.e. give priority to passenger safety through correct door operation over revenue collection tasks.
- Select locations to operate the doors from that give the best views of doorways. One way is for staff to spread throughout the train to minimise distances when observing passengers alighting / boarding at stations (e.g. stand at the 2nd and 5th carriages on a six car train).
- Step away from the train far enough to see the doorways in their allocated section of the train.
- Take such steps as are necessary to ensure all passengers are clear of doors and all doors are closed.
- The procedure for giving right-of-way at stations is detailed in Rail Operating Code CSR3.2, Section 3.2. This procedure applies in all situations, and does not alter depending on the numbers of staff on board.

1.4.2 Tranz Rail's instructions regarding the duties of Tranz Metro guards stated that:

> "All staff are to ascertain the destinations of passengers… *with special needs* so that assistance can be given when those passengers leave the train."

1.5 Other incidents where EMUs stopped short of platforms

1.5.1 There were several other incidents involving trains stopping short of platforms after the accident at Silverstream. Brief descriptions of those occurrences follow.

Redwood 13 June 2002

1.5.2 On 13 June 2002, Train 8268, a scheduled 1724 Wellington to Porirua EMU service, stopped at the up main line platform at Redwood with half of the last passenger car positioned off the south end of the platform. Passengers alighted through the rear doorway on to the ballast before making their way to the sealed pathway from the platform.

1.5.3 The Commission's investigation of this incident (occurrence 02-115) showed that this incident resulted primarily from the driver misjudging his braking as he approached the Redwood platform. This was probably caused by:

- the darkness and the poor quality of stopping points marked on the platform
- the torrential downpour which caused the train to wheel slip and further reduced visibility
- approaching a level crossing
- the headlight of an opposing train
- the platform was on the off-side to the drivers cab

- the train's headlight was on dim as it approached an opposing train
- under the conditions, the driver was concentrating on stopping the train rather than positioning it.

1.5.4 Since the incident the operator has taken the following safety actions:

- measured and repainted platform markings that identify where trains are to stop
- updated documentation to include a new instruction that requires drivers to stop at the relevant platform markings at all times.

Redwood 5 November 2002

1.5.5 On 5 November 2002, Train 7283, a scheduled 1828 Plimmerton to Wellington express EMU service consisting of 6 passenger cars, stopped at the down main line platform at Redwood with the rear 2 passenger cars positioned off the north end of the platform. No passengers alighted from the rear cars.

1.5.6 The Commission's investigation of this incident (occurrence 02-123) showed that this service was not scheduled to stop at Redwood but did so in response to passengers on the platform who wanted to travel to Wellington but had missed the preceding EMU, about 5 minutes earlier. When stopping the train, the driver positioned the front cars where the intending passengers were standing which resulted in the rear cars overhanging the end of the platform.

Wallaceville 5 November 2002

1.5.7 On 5 November 2002, Train 2679, a scheduled 2000 Upper Hutt to Wellington EMU service consisting of 6 passenger cars, stopped at the platform at Wallaceville with the rear passenger car positioned off the north end of the platform. No passengers alighted from the rear car.

1.5.8 The Commission's investigation of this incident (occurrence 02-124) showed that this service had been built up to a 6 car set to accommodate unusually high numbers of passengers travelling to Wellington. The driver later said that he was unaware of the additional 2 cars and positioned the train at the usual 4 car consist mark. On-board staff immediately drew his attention to the train consist and from there on he stopped at the appropriate places for 6 car EMUs.

Redwood and Porirua 19 November 2002

1.5.9 On 19 November 2002, Train 7218, a scheduled 0704 Wellington to Plimmerton EMU service consisting of 6 passenger cars, stopped at the up main line platform at Redwood with the rear passenger car positioned off the south end of the platform. Two passengers alighted from the rear car on to the ballast.

1.5.10 The same train also stopped at the up main line platform at Porirua with the rear door of the last passenger car positioned off the south end of the platform. No passengers alighted from the rear door at this time.

1.5.11 The Commission's investigation of this incident (occurrence 02-125) showed that the driver had failed to stop the train at the designated 6 car stopping mark.

2 Analysis

Silverstream

2.1 Although the guard was only on his third shift since reverting from being an EMU driver, the time he had spent away from guard duties did not compromise his ability to effectively function in the role of guard. However, when he clipped the passenger's ticket he should have noticed the endorsement. Although the passenger had shown the guard her blind concession card ID at the time she presented her ticket he could not recall having seen it. It is possible that the guard noted her disability but in the activities of altering berthing arrangements to accommodate the school party, had forgotten about her and any other passengers remaining in cars 3 and 4.

2.2 The actions taken by the guard in isolating the school party were appropriate and not uncommon. It was generally accepted amongst on-board staff that the noise, and often the behaviour of such groups could be a source of discomfort to other passengers. Likewise the altered berthing arrangements at stations en route was common practice in these circumstances.

2.3 The guard's position at the front door of the leading car was not the most effective location from which to get the best view of passengers boarding and alighting through the other doorways. Even though the school party was accompanied by supervisors, it would have been more prudent for him to have been further down the train, not only to monitor their behaviour while the train's doors were open but to give himself a better view of all the doorways. While this would not have prevented the train stopping where it did, he may have been in a better position to see the impending accident at the rear doorway and to have taken some action to prevent it.

2.4 Although Train 2643 consisted of 4 cars, the work load generated by the additional passengers was minimal and could be adequately covered by the guard without assistance. The main group of passengers, the school party and its supervisors, was travelling on one ticket and there were only about 15 other passengers on the train. A second on-board train person was rostered to join the train at Taita for the remainder of the journey to Wellington, as per Tranz Rail's procedures. It is considered that the staffing of the train was adequate and did not contribute to the accident.

2.5 Partially-sighted people do not necessarily require additional or special assistance when boarding or alighting a train and their independence is very important to them. However, that independence comes from an expectation that trains will always stop in a position which ensures that they, along with other passengers, can access the cars and platforms safely and with confidence. A similar accident could have been sustained by a sighted person who was not paying attention and had stepped out without ensuring that the platform was accessible through the doorway.

2.6 While the station platforms were marked to indicate the most suitable stopping places for EMU services of varying lengths, there was no requirement for drivers to adhere to them. As a result, drivers' decisions were influenced by such things as requests from the guard, the position of the station shelter, the number and location of passengers on the platform and the weather conditions. To maintain consistency, especially important for special needs passengers, and to reduce the potential for EMUs to stop with some of the train still hanging off the platform, the use of these marks should be made mandatory.

Other incidents

2.7 Despite the efforts made by Tranz Rail following the Silverstream accident, the problem of trains stopping short of platforms for various reasons continued. However, Tranz Rail have addressed this by increasing staff awareness of the causes and by further improving the stopping marks on the station platforms.

3 Findings

3.1 The sight-impaired passenger was severely injured when she fell from the train to the ground having stepped out of the rear door of the last car expecting that it was properly positioned at the platform.

3.2 Had the driver stopped the train at the appropriate guidance mark on the platform, the rear of the train would not have overhung the platform.

3.3 The driver stopped the train in accordance with the guard's request, which inevitably led to the rear of the train overhanging the platform.

3.4 By stopping short at the platform, the driver did not infringe any mandatory operating procedures in place at the time.

3.5 Having requested a specific stopping position for the train, the guard did not then position himself where he could best observe the occupants of the rear cars.

3.6 The staffing of the train met Tranz Rail's EMU services staffing policy and did not contribute to the accident.

3.7 The recent return of the guard to this role from EMU driver's duties did not contribute to the accident.

3.8 The presence of the training consultant did not distract the driver or contribute to the accident.

4 Safety Actions

4.1 On 10 October 2002, Tranz Rail advised that, following the Silverstream accident, it had completed painting platform markings to indicate the correct stopping distances at all suburban stations and that the approved safety system had been enhanced with the following instruction:

> All platforms have been marked with stopping marks for various consists that run on the line. Drivers must stop at the mark applicable to the number of cars on their service.

4.2 On 10 December 2002, Tranz Rail advised that on 7 November staff briefings had been issued reminding drivers that they must always stop at the platform marks and on 11 November a special briefing was held to highlight the importance of the marks given the high number of incidents that had occurred.

4.3 Also on 10 December 2002, Tranz Rail advised that:

> Given the number of incidents where trains have stopped short at Redwood a re-enactment was carried out on Wednesday 20 November. That re-enactment identified that some of the markings are difficult to see on this platform. As a result reflectorised markers have been placed beside the painted marks at the platform.
>
> If this trial proves successful the reflectorised marks will be placed at all platforms in Wellington Metro area.

4.4 In view of the safety actions taken no safety recommendation was made.

Approved for publication 29 January 2003

Hon. W P Jeffries
Chief Commissioner

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00-118 express freight and express passenger trains, derailments or near derailments due to heat buckles, various localities, 5 December 2000 to 2 March 2001

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