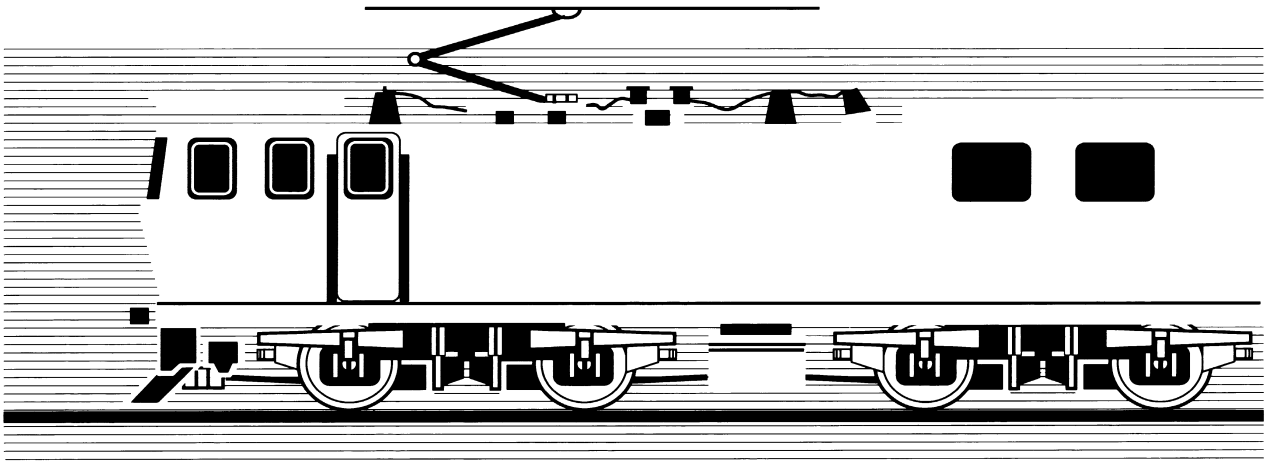
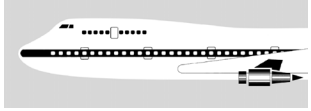
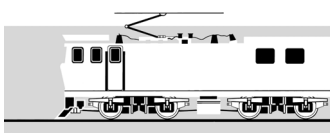


RAILWAY OCCURRENCE REPORT

02-129	train control incidents, trains authorised to enter sections of track already occupied by hi-rail vehicles and work groups, various locations	29 August 2002 – 4 December 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 02-129

train control incidents

trains authorised to enter sections of track already occupied by hi-rail vehicles and work groups

various locations

29 August 2002 - 4 December 2002

Abstract

On 29 August 2002, an incident occurred at Maimai when a locomotive engineer was authorised by train control to enter a section of track already occupied by a rail contractor. The locomotive engineer saw the contractor and stopped the train short of the work site.

On 21 November 2002, train control cleared a signal at Ashburton that authorised a train to enter a section of track that was already occupied by a hi-rail vehicle. Fortunately the driver of the hi-rail vehicle overheard the conversation between the train controller and the locomotive engineer and interrupted to advise that he was still in the section. The train did not enter the occupied section.

On 4 December 2002, an incident occurred near Lepperton when a locomotive engineer was issued with a track warrant by train control and given a signal to proceed into a section already occupied by a track gang replacing a broken rail. A collision was averted only because the track gang had cleared the track minutes before the train arrived.

Given the potential for each incident to have resulted in a collision and the similar issues arising from each incident, all 3 were combined into one report.

The safety issues identified included:

- the train controllers not following correct procedures for handling track user inquiries
- the lack of forward planning on the train control diagrams
- the train controllers' lack of attention in ensuring the train control diagram was accurate and complete
- the issuing of a track warrant into a section of track that at the time was known to be occupied
- the hand-over process when the outgoing train controller completed his shift
- train controllers not using, nor being required to use, signal "blocking commands" to protect maintenance gangs and hi-rail vehicles
- the absence of an area familiarisation visit for the train controller prior to certification.

The Commission's previous Occurrence Reports 00-101, 00-116 and 02-118 identified similar safety issues, and safety recommendations were made to the Managing Director of Tranz Rail to address the issues. Tranz Rail has now taken appropriate safety actions and no further safety recommendations have been made.

Contents

Figures

Abbreviations

CTC	Centralised Traffic Control
hr	hour(s)
HRV	hi-rail vehicle
km	kilometre(s)
m	metre(s)
MNPL	Marton – New Plymouth Line
MSL	Main South Line
SWL	Stillwater - Westport Line
Tranz Rail	Tranz Rail Limited
TC1	Train Controller 1
TC2	Train Controller 2
TWC	Track Warrant Control
TWACS	Track Warrant Computer System
UTC	co-ordinated universal time
VDU	visual display unit

Data Summary

Rail Occurrence Number	Train	Date	Time	km and line	Location
02-119	84 Shunt	29 August 2002	1035[1]	49.88 km Stillwater-Westport Line	Maimai
02-128	937	21 November 2002	0905[2]	95 km Main South Line	Ashburton
02-129	575	4 December 2002	1232[2]	170.95 km Marton-New Plymouth Line	Midhirst

Type of occurrences: track occupancy irregularities

Injuries: nil

Damage: nil

Operator: Tranz Rail Limited (Tranz Rail)

Investigator-in-charge: P G Miskell

[1] Times in this report are New Zealand Standard Time (UTC + 12 hours) and are expressed in the 24-hour mode.

[2] Times in this report are New Zealand Daylight Time (UTC + 13 hours) and are expressed in the 24-hour mode.

1 Introduction

1.1 Between 29 August and 4 December 2002 there were 3 separate incidents involving the authorisation of trains to enter sections of track that were already occupied by a work group or a hi-rail vehicle (HRV). Because of the commonality of the incidents they have been combined in one report. The incidents are summarised below:

- **Occurrence 02-119:** on Thursday 29 August 2002, 84 Shunt was authorised to enter the Reefton to Ikamatua section of the Stillwater-Westport Line (SWL), which was already occupied by a track welding contractor working on his own. The locomotive engineer saw the person working on track and was able to stop the train short of the worksite.
- **Occurrence 02-128:** on Thursday 21 November 2002, Train 937 was authorised to enter the Ashburton-Hinds section of the Main South Line (MSL), which was already occupied by a HRV travelling towards Ashburton. The operator of the HRV overheard the train controller's conversation with the locomotive engineer and he called the train controller, who was then able to return the starting signal to stop before the train entered the occupied section.
- **Occurrence 02-129:** on Wednesday 4 December 2002, Train 575 was authorised to enter the Lepperton-Stratford section of the Marton-New Plymouth Line (MNPL), which was already occupied by a track maintenance gang replacing a broken rail. The track gang completed the work and cleared the track 2 minutes before the train passed through their worksite.

1.2 The factual information and analysis applicable to each incident is dealt with separately, followed by an analysis summary and common sections covering all findings and safety actions.

2 02-129, Train 575, Midhirst, 4 December 2002

2.1 Factual information

Narrative

2.1.1 On Wednesday 4 December 2002 at 1045, the Stratford track gang was authorised by train control to carry out maintenance work on the MNPL between Tariki (173.2 km) and Browns (176.5 km).

2.1.2 On the same day a track inspector carried out a regular inspection between Stratford and New Plymouth. At about 1025 the train controller (TC1) authorised a 20-minute track occupation for the track inspector to inspect the track between Stratford and Midhirst. On arrival at Midhirst at about 1046 TC1 extended the authority to be off and clear at Browns by 1130 (see Figure 1). The track inspector was advised of the presence of the track gang working between Tariki and Browns.

2.1.3 At about 1120, the track inspector found a broken rail at 170.95 km. He continued his inspection until he reached the track gang at 175 km about 10 minutes later where he advised the ganger of his findings.

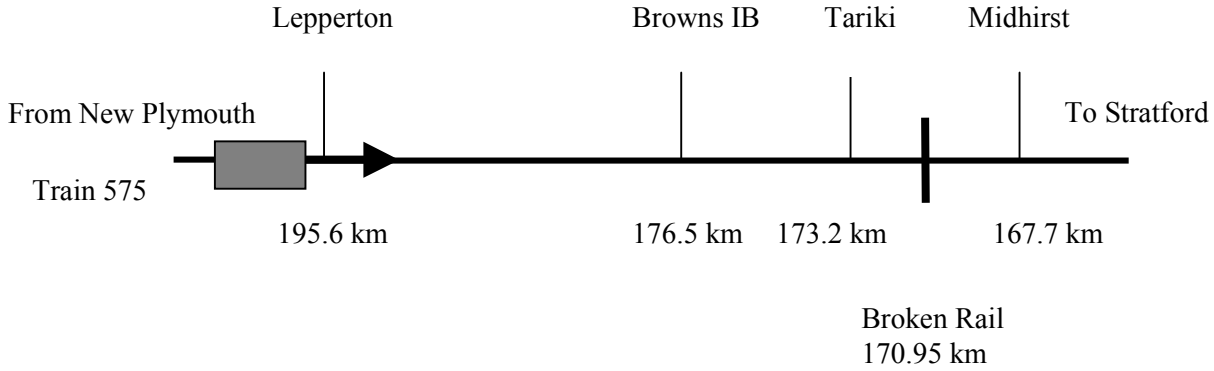


Figure 1
Location of the broken rail
(not to scale)

2.1.4 At about 1155 the ganger contacted TC1 and cancelled his work time between Tariki and Browns and requested track occupancy instead between Midhirst and Tariki to replace the broken rail. TC1 authorised the track occupancy, and advised that the next train into the section was Train 575, a New Plymouth to Whareroa express freight service departing at about 1215. He said this train would be held at Lepperton until the ganger confirmed the broken rail was replaced.

2.1.5 At 1218 TC1 issued the locomotive engineer of Train 575 a track warrant to proceed from Lepperton to Stratford and the train departed from New Plymouth about 2 minutes later. As he approached Lepperton, the locomotive engineer observed the intermediate signal (19663) displaying a yellow caution indication and stopped his train at Signal 8L, his next signal in advance, which was displaying a red aspect (see Figure 2).

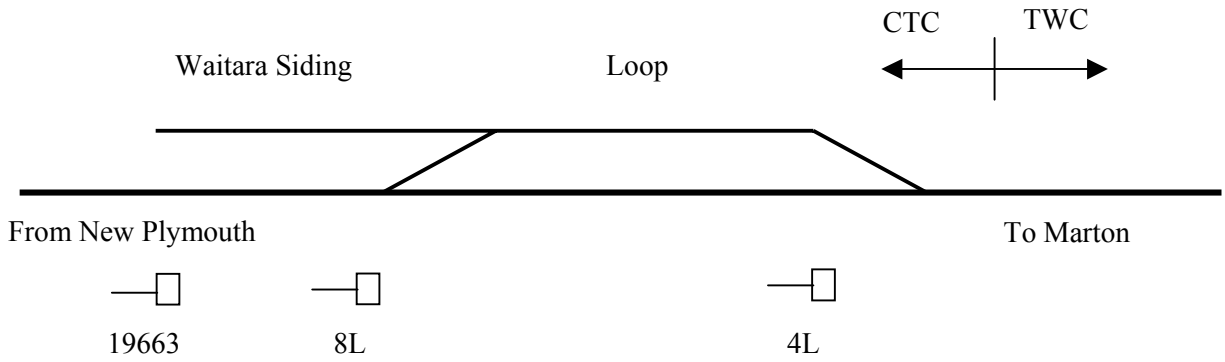


Figure 2
Layout of signals passed by Train 575 at Lepperton
(not to scale)

2.1.6 At 1231, TC1 cleared 8L Signal to proceed and also cleared 4L Signal, which allowed Train 575 to enter the occupied Lepperton-Stratford track section.

2.1.7 At about 1245 a change of shift hand-over between TC1 and a second train controller (TC2) took place, after which TC1 left the train control office.

2.1.8 At about 1251 the ganger off-tracked his HRV at 171.025 km and called TC2 to advise that the broken rail had been replaced and the track was now safe for trains.

2.1.9 Train 575 went through the worksite about 2 minutes after track clearance was given.

2.2 Signalling information and operating system

2.2.1 Trains operating on the single-line track between New Plymouth and Lepperton were signalled from the centralised train control office in Wellington under Centralised Traffic Control (CTC) Regulations.

2.2.2 CTC was a train signalling system that enabled complete control of points and signals over a section of line. The system was computer-assisted and allowed a train controller to set up train movements in advance by sending commands to out-station control points. The points and signals changed in accordance with the commands, and their status were displayed on the train controller's monitor.

2.2.3 Within the CTC system a facility called signal blocking command was available. This facility allowed the train controller to prevent signals from being cleared and ensured there was no inadvertent use of the signals. Signals 8L and 4L at Lepperton were controlled signals and could be tagged using the signal blocking command. However, the use of this blocking command was not mandatory at the time of the incident.

2.2.4 TC1 had used the blocking command to protect the track inspector's track occupation when travelling between Stratford and Lepperton. At 1231 he removed the command before clearing 8L and 4L signals.

2.2.5 Trains travelling on the MNPL between Wanganui and Lepperton operated under the Track Warrant Control (TWC) system. Intermediate Boards[3] (IB) were located between Lepperton and Stratford at Tariki and Browns.

2.2.6 TWC was introduced into Tranz Rail in 1988 as an alternative to a signalling system for managing train operations on lower density routes and was a method for ensuring that only one train service had authority to occupy a specified section of track at any time. There was no requirement for a train controller to issue a track warrant for an HRV movement or track occupation by a maintenance gang.

2.2.7 A Track Warrant Computer System (TWACS) provided assistance to the train controller when he prepared and verified track warrants. Each track warrant identified the train number together with the designation of the person responsible for carrying out the instructions and the location of the train at the time the instruction was issued.

2.2.8 The TWACS user manual described a procedure for "blocking" that allowed the train controller to flag portions of track as not usable. The blocking facility was available to TC1 for the Lepperton-Stratford track section. However, the use of this facility was not mandatory.

2.3 Radio communication

2.3.1 The radio network provided voice communication between train control and train crews as well as track maintenance staff and HRVs. The radio system was open channel meaning that any person within the coverage area of a particular repeater would hear all calls through the repeater.

2.3.2 Channel 3 was the designated channel for the Wanganui to New Plymouth section of the MNPL except between 180 km (between Lepperton and Browns IB) and 154 km (between Eltham and Stratford) where Channel 4 was used.

[3] A notice board provided between stations to identify a location that may be used to designate a limit for a track warrant.

2.4 Train control procedures

Train control diagram

2.4.1 Tranz Rail Operating Code Section 6 Instruction 3.3 **Forward Planning** stated in part:

> All train movements and crossings must be anticipated for some hours ahead and be plotted in pencil on the diagram. This forward planning is vital for good train controlling.
>
> It enables the Train Controller to sum up the situation quickly and avoids the necessity for hasty decisions as problems can be foreseen earlier. Particular emphasis should be placed on the accuracy of plotting train movements as the operation of motor trolleys, hi-rail vehicles and track maintenance work can be vitally affected.

2.4.2 The train control diagram showed the timetables of all scheduled trains printed in green. The train controller plotted the anticipated movement of each train in pencil and the actual movements of the trains were plotted in red and compared to the scheduled and anticipated movements.

2.4.3 All movements authorised by track warrant were plotted in blue ink on the train control diagram.

2.4.4 The train control diagram showed the scheduled departure time of Train 575 from New Plymouth was 1215 but the train actually departed 5 minutes later. TC1 did not draw a pencil plot line of Train 575 on the diagram because it approximated the scheduled line.

2.4.5 Before a track warrant could be issued the train controller must:

- check whether or not a previous track warrant was still in effect for any part of the limits being authorised
- plot the warrant line and number in blue on the diagram
- establish that there is no conflict with other movements up to the terminating limit.

2.4.6 When TC1 issued a track warrant to the locomotive engineer of Train 575, a section of the track within the limits of the warrant was occupied.

Track user inquiries

2.4.7 Tranz Rail Operating Code Section 6 Instruction 15 **Inquiries from Maintenance Workers, hi-rail vehicles and Trolley Users** stated in part:

> **15.1 Accurate and Updated Information**
>
> The necessity for absolute accuracy when dealing with inquiries from trolley, hi-rail vehicle users and maintenance staff working on or near the track is vital. There is no margin for error, oversight or indifferent approach concerning the movement of trains, hi-rail vehicles or trolleys when handling inquiries from these members. Their safety depends on the accuracy of information supplied by the TC [Train Controller] and there should be no possibility of misunderstanding by the inquirer.
>
> **15.1.2 Pre-Authorisation check and use of Train Control Diagram for Track Occupancy**
>
> Before an occupation is authorised the Train Controller must establish positively whether any conflict exists with either existing occupations, track maintenance machinery or trains within any part of the area requested. All movements and

work authorised MUST be plotted on the Train Control Diagram in black ink. This will establish if it is safe to authorise the occupation.

The Train Controller MUST establish by reference to these plot lines that:

- There is no conflict with a train or trains for any part of the area covered by the plot line that is about to be authorised.
- There is no conflict with occupations already in effect for any part of the area covered by the plot line that is about to be authorised.

15.1.3 Designated Time – Safety Buffer (in part)

For occupations the designated time MUST include a minimum safety buffer of fifteen minutes before the arrival of the next train.

If due to emergency work a conflict cannot be avoided any train that may conflict with occupation must be either detained by a fixed signal or advised to STOP clear until further advised by Train Control before the occupation is authorised.

15.1.4 Plotting Conventions (in part):

Where Train Control agrees to hold all movements until the Track User gives clearance the designator "H" drawn to the right extremity of the plot line [black horizontal line] is to be used to indicate the line is obstructed until the Track User has called and given clearance. In this case the procedure at Clause 15.1.3 for emergency work MUST be implemented. The occupation once completed is to be marked using a tick through the "H".

Reporting of track irregularities

2.4.8 The emergency work was carried out in compliance with Tranz Rail Operating Code Section 6 Instruction 18.0 that stated in part:

When brought to attention, track irregularities of any nature must be promptly investigated.

The Track and Structures person concerned must be advised and traffic should be held pending a response from the Track and Structures person regarding the movement of trains through the affected area. In the event of the person not calling at the agreed time, Train Control must make arrangements to ascertain the reason for the delay to the call. Train Control is to draw reported faults etc on the diagram, i.e. reported time and clearance time, arrange for signals controlling entrance to the affected area to be placed at Stop, in Track Warrant Control territory the TWACS blocking feature can be used and if necessary the radio computer timer can be activated on the radio call indication for a mutual agreed call time.

Broken rail welds are to be dealt with in the same manner as broken rails. Once advised of a broken weld, TC's must not allow any trains to proceed into the affected section of track until authority has been obtained from the maintenance person at the site and arrangements made for the trains to pass safely over the broken weld.

There is no margin for error in such circumstances. Where any doubt exists concerning the safety of the track, arrangements must be made to have it inspected prior to any train movements.

2.4.9 The track gang carried out the emergency work under Tranz Rail Engineering Rule 904 that stated in part:

> **904 Emergency Protection**
>
> **(a) Establishing Protection**
> When emergency protection is required, provided radio communication is available, communicate with Train Control in order that any train approaching may be stopped.

2.4.10 The ganger arranged with TC1 to have Train 575 held at Lepperton until he reported the rail replacement was complete and the track safe for traffic.

Hand-over process

2.4.11 Under Tranz Rail Operating Code, an incoming train controller must read and understand all Bulletins, orders, instructions and operating information relevant to the area about to be controlled. The outgoing train controller must draw the attention of the incoming train controller to the location of maintenance work, HRV movements, late running trains and any other unusual circumstances.

2.5 Personnel

Locomotive engineer of Train 575

2.5.1 The locomotive engineer had about 25 years driving experience with Tranz Rail and held current certification for the duties he was performing.

The ganger

2.5.2 The ganger had 27 years experience dealing with all aspects of track maintenance. He held the appropriate certification for the task he was undertaking.

The track inspector

2.5.3 The track inspector had about 15 years track maintenance experience and held the appropriate certification for the duties he was undertaking. He was promoted from ganger to his current position in March 2002.

Train controller (TC1)

2.5.4 TC1 had been certified on the Marton - New Plymouth train control desk in September 1998. His most recent theory audit was conducted in September 2002 and a desk assessment[4] was performed the following month.

2.5.5 TC1 was off duty the day before the incident and had been rostered off duty for the day of the incident. However, he agreed to work on the condition that he finished the shift at 1300, 2 hours early, to fulfil a personal commitment.

2.5.6 At about 1130 TC1 authorised a continuation of the track inspector's occupation from 175 km to Lepperton with a designated time of 1215. TC1 applied the blocking command to 4L signal and reversed the No.3 points at the south end of Lepperton to route the track inspector into the loop and cross Train 575.

2.5.7 At about 1150, TC1 received a selcall[5] message from the ganger stating that the track inspector had identified a broken rail at 170.95 km and the track gang wanted to relocate and replace the

[4] A desk assessment, conducted at 8-monthly intervals, was a process to review the train controller's technical competence and operating practices seen on the day.

rail before the arrival of the next train. TC1 acknowledged the call and extended the gang's current working rights from 180 km to Midhirst and said that he would hold Train 575 at Lepperton until he heard back that the work was complete.

2.5.8 Although TC1 plotted the authorised track occupation on the train control diagram until 1230, he did not note the reason on his diagram nor did he put the designator "H" at the right extremity of the plot line.

2.5.9 At about 1220 the track inspector called TC1 and advised that he was at 186.2 km about 10 km short of Lepperton and that he would off track at that location rather than continue on to Lepperton. TC1 acknowledged the changed plan and at 1223 restored the No.3 motor points at the south end of Lepperton to normal.

2.5.10 At 1228 TC1 observed on his visual display unit (VDU) that Train 575 was on the approach track to Lepperton. He referred to his train control diagram and saw that the track gang's occupation had been drawn to 1230 and the occupation closed off, even though the gang had not reported the completion of the rail replacement.

2.5.11 At 1231 TC1 removed the blocking command and cleared Signals 8L and 4L to authorise the departure of Train 575 from Lepperton to Stratford.

2.5.12 At about 1250 TC1 handed over the shift to TC2, and advised him that Train 575 had departed Lepperton, and the whereabouts of the track inspector. TC1 did not advise TC2 of the track gang repairing the broken rail.

Train controller (TC2)

2.5.13 TC2 had more than 10 years experience on the Marton-New Plymouth train control desk and held current certification for the duties he performed.

2.5.14 At about 1254, TC2 received a call from the ganger at 171.25 km stating the repair work had been completed and the gang were off and clear of the track. TC2 queried the gang's location and the ganger responded by saying that they had repaired a broken rail at 170.95 km.

2.5.15 TC2 did not know about the broken rail as there was neither mention of such work during the hand-over nor was any reference made on the train control diagram. TC2 acknowledged the ganger's response then asked whether Train 575 had arrived yet to which the ganger replied that it had not. The train passed the worksite about 2 minutes later.

2.6 Train control voice log

2.6.1 A copy of the train control voice log was made available for playback and analysis.

3 Analysis

3.1 The near collision occurred when TC1 authorised Train 575 to enter a section of track already occupied by a track maintenance gang replacing a broken rail.

3.2 When the ganger requested track occupancy of indefinite time to replace a broken rail, TC1 did not use standard train control procedures and practices that would have prevented Train 575 entering the same track section, including:

- lack of forward planning information on the train control diagram

[5] An automatic selective calling system used on very high frequency radios for communication between hi-rail vehicles and train control.

- the manner in which the track gang occupancy was plotted on the train control diagram
- the blocking command was not maintained to prevent the inadvertent release of the signals at Lepperton
- the track warrant for the Lepperton to Stratford section was issued after the maintenance gang had been authorised to occupy the section
- the blocking command in TWACS was not used.

3.3 TC1 had correctly plotted the track gang's original track occupancy from Tariki to 180 km between the hours of 1045 and 1215. However, when the ganger advised of the broken rail at 170.95 km, TC1 had not closed off the original occupation and redrawn the limits of the new track occupancy. As a result the train control diagram did not reflect what was taking place out in the field.

3.4 Had TC1 followed procedures and drawn a solid black horizontal line across the diagram with the words "Broken rail 170.95 km under repair ", to highlight the nature of the emergency work being performed, the line would have crossed the scheduled line for Train 575, and the plot line had it been drawn. The intersecting lines would have alerted TC1 to the potential conflicting track occupations.

3.5 The track occupation for the rail replacement should have been given high priority by TC1 with Train 575 held at Lepperton as agreed, until the ganger reported the work was completed and the track was again safe for the passage of trains.

3.6 The plotting deficiencies raised the issue of primacy of the train control diagram in dealing with track user inquiries. This issue was previously raised in Rail Occurrence Report 00-101 after an incident between a HRV and a train near Woodville, when Tranz Rail issued Train Control Safety Briefing No. 5 on 15 September 2000, which stated in part:

> The diagram, the primary tool of the Train Controller, is where movements are plotted and recorded. Before signalling a train past a signal, you must ensure the section the train is entering is clear and safe, and that can only be guaranteed by referring to the diagram. When you have plotted the intended movement, and there is no conflict, the signals can be cleared accordingly.

This left no doubt as to the importance of the train control diagram in all aspects of a train controller's duties.

3.7 Under TWC procedures, it was allowable for train controllers to issue a track warrant for a train to run from Lepperton to Stratford before the train departed New Plymouth. However, had TC1 entered the plot line of Train 575, and a horizontal line representing the emergency work at 170.95 km with the designator "H," it was likely the warrant would have been issued at Lepperton rather than New Plymouth. Had TC1 deferred issuing a track warrant until the train arrived at Lepperton he would have had a further opportunity to confirm that the track section to which the warrant applied was occupied. The incomplete and inaccurate entries on the train control diagram reduced the effectiveness of the safety defences.

3.8 The inaccuracies and lack of detail on the train control diagram meant that TC2 was not made aware of what was actually happening in the field. It was understandable that TC2 responded with further follow up questions when the ganger handed back his track occupation for the emergency work. Had the train control diagram included details relating to the broken rail and the designator drawn on the plot line it was likely that during the hand-over TC2 would have sought confirmation from TC1 about the status of the emergency work.

3.9 TC1 reversed the south end mainline points and applied a blocking command to Signal 4L at Lepperton on his expectation that the track inspector would be entering the loop at Lepperton by 1215. Maintaining the blocking command provided an additional defence against premature release of the signal. Although TC1 had applied the blocking command to protect the track

inspector, he did not continue it once he knew the track inspector was clear of the track even though the track gang still occupied the track. TC1 closed off the track occupation box which prematurely indicated that the emergency work had been completed. The effectiveness of the final safety defence provided by the blocking command was therefore nullified.

3.10 The absence of any reference to the use of TWACS blocking commands in both the TWC Rules and the Operating Instructions for Train Control would suggest that the facility, while available to train controllers, was not often used. Had its use been mandatory and had the train control diagram accurately reflected what was happening in the field, TC1 would have been prevented from clearing 4L Signal Lepperton and authorising Train 575 to enter an already occupied track section.

3.11 A playback of the train control voice log revealed no reference to the rail replacement being completed by 1230. Rather, the ganger was to make a call once the work had been completed. So it remained unclear why TC1 thought the emergency work would be completed by 1230 and why the track occupation was closed off on the train control diagram without waiting for clearance from the ganger. With 2 simultaneous occupations TC1 may have overlooked the emergency work once the track inspector reported clear.

3.12 The maintenance gang carried out the rail replacement on the understanding that they had been granted a work window with an unspecified time period and that Train 575 would be held at Lepperton until the work was complete. This was the accepted practice when carrying out such work. In view of the safety actions taken by Tranz Rail no recommendation relating to Emergency Protection Rules has been made.

3.13 It was only good fortune that the gang and their vehicle were clear of the track when Train 575 went by some 2 minutes after the ganger had given line clearance. Had the work taken longer, the worksite been nearer Lepperton or the train been running earlier there was the potential for a more serious outcome.

4 02-119, 84 Shunt, Maimai, 29 August 2002

4.1 Factual information

Narrative

4.1.1 On Thursday 29 August 2002, at about 0800 a track maintenance contractor called train control and requested track occupancy at Maimai Siding, between Tawhai and Ikamatua on the Stillwater-Westport Line (SWL), to carry out maintenance welding on the mainline turnout. The train controller referred to the train movements plotted on his diagram and because of planned train movements authorised a 15-minute track occupation to enable the contractor to carry out preparation work only. He instructed the contractor to be off and clear of the track by 0815 for the passage of the next service, Train 842.

4.1.2 The train controller incorrectly plotted the contractor's track occupation at Matai rather than at Maimai on his train control diagram.

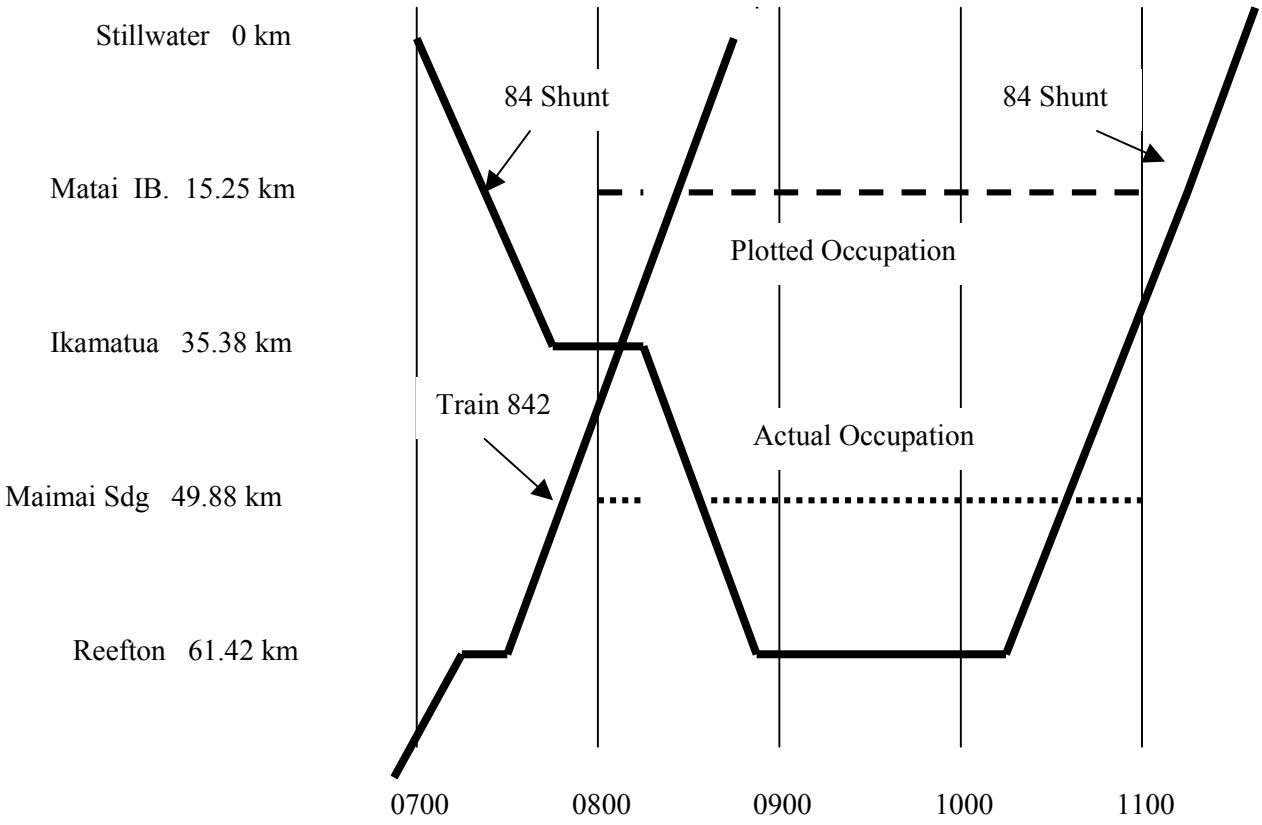


Figure 3
Information plotted on the train control diagram
(not to scale)

4.1.3 Train 842 was a Ngakawau-Lyttelton express freight service consisting of 2 DX class locomotives in multiple hauling 22 loaded coal wagons for a total of 1470 tonnes and was 350 m long.

4.1.4 At about 0810, a planned crossing between Train 842 and 84 Shunt, a Stillwater to Reefton return shunting service, occurred at Ikamatua (see Figure 3). The shunt service consisted of 2 DX class locomotives hauling 3 wagons totalling 150 tonnes and was 83 m long.

4.1.5 At 0830 the contractor called the train controller and confirmed that Train 842 had passed and requested time on track to carry out the maintenance work. The train controller again incorrectly plotted the track occupation at Matai, rather than Maimai. He recorded the contractor's cell phone number beside the plot line, and asked the contractor to call again at 1000.

4.1.6 The train controller was unsure at what time 84 Shunt would depart from Reefton on its return journey to Stillwater, so he said that he would call the contractor when the shunt was ready to depart.

4.1.7 At 1000 the contractor called the train controller and requested an extension of his time on track. The train controller authorised the continuation of the track occupancy at Maimai until 1100 but still plotted the occupation at Matai. He told the contractor that should the shunt conflict with the occupation by departing Reefton earlier than anticipated he would call the contractor to advise.

4.1.8 At 1015 the train controller issued a track warrant to the locomotive engineer of 84 Shunt authorising him to proceed from Reefton to Stillwater.

4.1.9 The locomotive engineer of 84 Shunt had seen the contractor near the siding on his outward journey to Reefton and had anticipated the contractor would still be working there when he returned so he approached the site with caution and was prepared to stop short of the siding.

4.1.10 At about 1035, 84 Shunt approached Maimai Siding. Seeing the contractor still working on track, the locomotive engineer sounded the locomotive horn and stopped the train about 70 m short of the work area. The contractor removed his equipment from the track before calling the train controller to inform him of the situation.

4.1.11 The train controller was stood down from train control duties while his manager was investigating the incident.

4.2 Site information

4.2.1 Maimai Siding was a single ended siding located at 49.88 km SWL.

4.2.2 The maximum authorised line speed between 28.11 km and Reefton was 50 km/h.

4.3 Operating system

4.3.1 TWC was used to manage train services on low-density routes such as the SWL and was a process for ensuring that at any point in time only one rail service vehicle had authority to occupy a specified section of track. TWC was enhanced by the use of a TWACS that did not allow the train controller to issue a track warrant when another warrant existed for the same track section.

4.4 Train control procedures

4.4.1 Tranz Rail's instructions required that once track occupancy details have been established the train controller was to:

- Plot the movement on the train control graph
- Execute the required protection and include the 15-minute safety buffer
- Give the correct time using the phrase "the time is"
- Repeat back, advise and authorise:
    - the on and off tracking locations and stations between
    - the last known location of the next train conflicting with the occupation
    - other track occupations that may conflict
    - the designated time to be clear
- Obtain an acknowledgement the track user has understood this information.

4.4.2 A review of the train control voice log confirmed that on each occasion the contractor requested track occupancy, both he and the train controller referred to the correct location at Maimai.

4.5 Personnel

The rail contractor

4.5.1 The contractor was an experienced operator and had been based in the South Island for about 4 years. He gained his Level C operating certificate[6] , about 7 years before this incident.

4.5.2 The contractor was working under Tranz Rail's Operating Rule 908 "Clearing for Trains", which was used where work was of short duration and unlikely to interfere with the safe running of trains. Before he was authorised to start work he advised the train controller of his identity, location, the nature of the intended work, the method of protection, and time required.

The train controller

4.5.3 The train controller gained his certification on the Main South Line desk (south of Studholme) on 31 July 2000. He achieved certification for the remainder of the Main South Line and the Main North Line desk on 11 July 2001. His certification on the desk that included the SWL was achieved on 22 August 2002.

4.5.4 Although certified for the SWL, at the time of the incident he had not undertaken a familiarisation trip to the area. This was completed during the week ending 6 September 2002, some 2 weeks after achieving certification and a week after the incident.

4.5.5 The incident occurred at 1035 during the fourth hour of his 8-hour day shift.

5 Analysis

5.1 The train controller authorised 84 Shunt to enter the section of track because he had incorrectly plotted the contractor's occupation at Matai instead of Maimai, so his train control diagram indicated that the section of track was clear. However, the authority was given to enter a section of track that was occupied.

5.2 Although the train controller was familiar with train control procedures and practices, he was unfamiliar with the SWL field environment. The contractor had correctly identified his location as Maimai and gave the adjacent stations when he requested track occupancy and the train controller authorised the occupation at Maimai. However, the train controller inexplicably plotted the track occupation at Matai. Had the train controller travelled the route with an experienced operator before his certification it was possible he would have had a mental picture of the locations and the subsequent confusion may not have happened. The similarity of the names probably contributed to the train controller's confusion.

5.3 Even though the train controller correctly stated the occupation as Maimai, had he followed correct procedures and identified the stations on either side of the occupation he may have plotted the occupation at the correct location.

5.4 After he had authorised the first track occupation at Maimai the train controller told the contractor that the next service through the section would be Train 842.

5.5 After the contractor had cleared the track, a train went through his work area. From the information given by the train controller the contractor assumed that it was Train 842 so he contacted the train controller and advised him accordingly. However, unknown to the contractor, Train 842 had passed through Maimai about 10 minutes before he had arrived on site and the train he saw was in fact 84 Shunt en route from Stillwater to Reefton.

[6] Minimum qualification to establish protection and operate a hi-rail vehicle on track.

5.6 If the contractor had been familiar with Tranz Rail's train identification system he may have been able to alert the train controller to the fact that it was 84 Shunt that crossed his worksite. Had he been able to do so, it might have alerted the train controller to his incorrect plot. However, he was not required to have a detailed knowledge of the train services and it was the responsibility of the train controller to provide accurate information regarding train movements.

5.7 Train 842 and 84 Shunt had crossed at Ikamatua, midway between Matai and Maimai at 0810. Train 842 was due at Matai at about 0825 while 84 Shunt was due at Maimai at about the same time. These coincidental arrival times at the actual and wrongly plotted locations of the track occupation probably reaffirmed to the train controller that his plot line was correct.

5.8 The controller had another 2 opportunities to recover from his plotting error. The contractor gave his location as Maimai during his 3 separate conversations with the train controller and although Maimai was repeated by the train controller on every occasion it was not until the contractor reported the arrival of 84 Shunt at Maimai that he realised his error.

5.9 Had the contractor's occupancy been authorised by the issuing of a track warrant, the TWACS system would have prevented the issuing of another track warrant into the already occupied section. Tranz Rail's Track Occupancy Rules have been amended to include the mandatory use of track warrants for the protection of track staff carrying out maintenance work and in view of this no safety recommendation relating to the mandatory use of blocking procedures in track warrant areas has been made.

6 02-128, Train 937, Ashburton, 21 November 2002

6.1 Factual information

Narrative

6.1.1 On Thursday 21 November 2002, Train 937, a Middleton to Dunedin express freight service departed Middleton at 0730, about 2 hrs 30 minutes later than scheduled.

6.1.2 At about 0815 a track inspector called the trainee train controller (TC1) from Maronan Road level crossing, about 4 km south of Ashburton on the Main South Line (MSL), and requested one hour track occupancy to travel north to the crossing loop at Chertsey in his HRV (see Figure 4).

6.1.3 TC1 discussed the track inspector's request with his tutor (TC2) then declined the request. He instructed the track inspector to wait near the crossing and that he would call back as soon as Train 937 had arrived in Ashburton yard, thus having the track clear for the HRV.

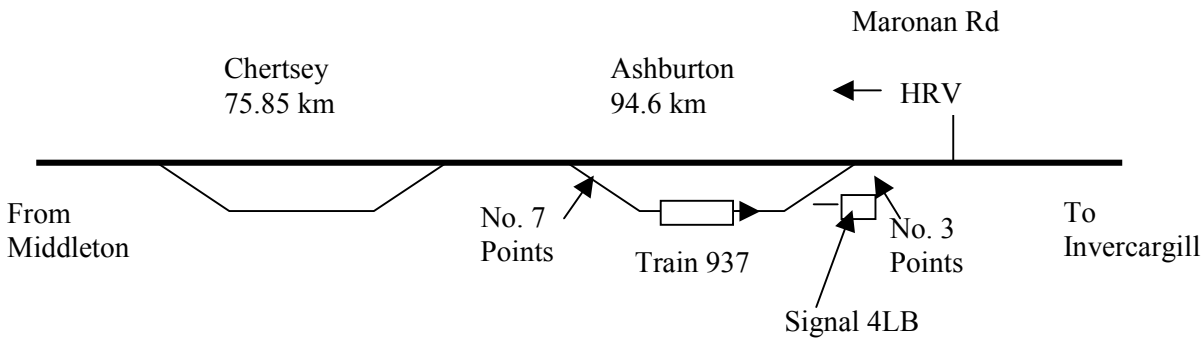


Figure 4
Chertsey-Ashburton track section
(not to scale)

6.1.4 TC2 then instructed TC1 that once Train 937 berthed in the yard at Ashburton, he was to apply the signal blocking command and then advance the track inspector from Maronan Road level crossing through to the mainline at Ashburton. TC1 was also instructed to ensure the track inspector called when he was clear of the south end mainline points at Ashburton. TC2 then left the train control desk temporarily to arrange a relief locomotive engineer for a late running train in the area.

6.1.5 At about 0850 TC1 called the track inspector and advised him that Train 937 was at Ashburton and that he could on-track his HRV and proceed on the mainline to Chertsey and to be off and clear by 0945. The inspector recorded the track occupancy on his On Track Time Tracker[7] form and confirmed the details of the occupancy with TC1.

6.1.6 TC1 plotted the HRV movement on the train control diagram but did not apply the signal blocking command facility to the signals controlling the departure of Train 937 from the loop at Ashburton as he had been instructed to by TC2. He said he had been trained to get into the habit of using the blocking commands to protect track occupations and HRV movements but could offer no explanation why he had not done so this time.

6.1.7 At about 0855, TC2 returned to the desk and TC1 left for a personal needs break. As TC1 left he confirmed with TC2 that the track inspector had been sent through to the loop at Chertsey.

6.1.8 A few minutes later the locomotive engineer of Train 937 called train control to advise he had finished shunting and was ready to depart Ashburton. TC2 acknowledged the call and told him his light was coming up. TC2 then set the route and cleared the down starting signal from the loop to allow Train 937 to re-enter the mainline.

6.1.9 The track inspector overheard the radio communication between the locomotive engineer and TC2, so he base-called TC2. TC2 suspected the track inspector had yet to reach Ashburton so he immediately cancelled the starting signal and set the points back to normal before he responded to the radio base call.

6.1.10 TC2 instructed the track inspector to continue north towards Chertsey and call when he was clear of the south end points at Ashburton.

6.1.11 At about 0910 the track inspector confirmed to TC2 that he was clear of the south end points. TC2 then authorised Train 937 to depart Ashburton.

6.2 Site and signalling information

6.2.1 Trains operating between Christchurch and Oamaru on the MSL were signalled from the centralised train control office in Wellington under Centralised Traffic Control (CTC) Regulations.

6.2.2 Signal 4LB at Ashburton was a controlled signal and could be tagged using the signal blocking command as described in Section 2.2.3, but this tagging was not mandatory.

6.2.3 There was a time delay between a train controller sending the clear command and Signal 4LB responding. The delay was designed to provide adequate warning time to motorists and permit the activation of barrier arms at the level crossing, a few metres past the signal.

6.2.4 The locomotive engineer was about 200 m from Signal 4LB and, in anticipation of a proceed signal, was about to move his train when he observed the barrier arms for the level crossing immediately in advance of the signal come down then go back up. He said the signal remained at stop.

[7] The On Track Time Tracker form was available to the HRV operator to record the limits of his track authority.

Train control procedures

6.2.5 Tranz Rail's procedures for handling track user enquiries are described in Section 2.4.7 of this report.

6.2.6 Tranz Rail's Rail Operating Code Section 6 Clause 15.1.8 refers to hi-rail Vehicles berthing on crossing loops and states in part:

> **15.1.8 Berthing on Crossing Loops**
>
> hi-rail vehicles travelling in CTC areas may berth on crossing loops to allow trains to pass. They MUST be protected in accordance with the instructions in Rule 914(l).
>
> NOTE: The train controller will be responsible for authorising a movement after taking into account the requested on-track time and train movements within the area concerned. After this the train controller is then responsible for ensuring that no trains conflict with that movement.

6.3 Personnel

Locomotive engineer of Train 937

6.3.1 The locomotive engineer had 36 years experience with Tranz Rail and had held grade 1 locomotive engineer certification for more than 20 years. His certification was current at the time of this incident.

Track inspector

6.3.2 The track inspector had 2 years track inspecting experience and held current certification for his duties. Tranz Rail contracted out the inspection and maintenance of the rail infrastructure to Transfield Infrastructure Services Ltd (Transfield) from 23 March 2002. The track inspector transferred to Transfield at that time.

Trainee train controller (TC1)

6.3.3 TC1 was recruited into the train control training programme from outside Tranz Rail in July 2002 after completing the prescribed number of pre-enrolment train control correspondence course modules[8]. On 19 July he completed a 2-week supervised induction course that was designed to expose trainee train controllers to the various signalling systems and the operating environment.

6.3.4 A 4-week course in the train control school followed the induction course before TC1 started his on-the-job training on the MSL desk on 26 August 2002. Although he had other on-the-job tutors, TC2 had been responsible for most of TC1's desk training. TC1 was primarily rostered on the Monday to Friday 0650 to 1500 day shift during his training, but he did have exposure to a week of night shift on the same desk during his training period.

6.3.5 As part of the on-the-job training he had an unsupervised one-week field trip from 21 October 2002, during which he travelled by a combination of car, train and HRVs from Christchurch to Bluff and return, stopping at all major yards.

Tutor train controller (TC2)

6.3.6 TC2 was experienced both as a train controller and as a tutor. He had been involved as an on-the-job tutor train controller since 1976. A requirement to train new train controllers had

[8] Undertaken by potential train controllers before they commence formal training.

increased pending the planned relocation of the national train control centre to Auckland. As the tutor, TC2 was ultimately responsible for all decisions made and actions taken on the desk during on-the-job training.

7 Analysis

7.1 A collision between the HRV and Train 937 was averted when the track inspector contacted TC2 after he overheard the locomotive engineer requesting and being given authority to enter the Ashburton-Hinds track section that he was occupying. Had the inspector not heard the locomotive engineer's request it was probable that Train 937 would have departed Ashburton and entered the occupied section.

7.2 Tranz Rail's Operating Code was specific in permitting HRVs to berth on crossing loops to cross trains in CTC areas, providing they were appropriately protected. However, there was no similar reference in the code permitting HRV's to berth on the mainline to cross trains. Train control practice was such that HRVs did remain on the mainline in CTC areas while trains operated from the loop, provided the HRV was protected by maintaining signals controlling the departure from the loop at stop. The application of the signal blocking command was a further defence available but its use was not mandatory at the time of the incident.

7.3 When TC2 left TC1 in charge of the desk he had expected that as instructed, TC1 would apply the signal blocking command to Signal 4LB before authorising the track inspector to move north to the mainline at Ashburton. His expectation was reinforced when TC1 confirmed the track inspector was on his way to Chertsey. TC2, thinking that the track inspector had already reached Ashburton and the blocking command had been removed, authorised the departure of Train 937.

7.4 Although TC2 was responsible for all aspects of the operation of the train control desk, his absence for a few minutes to arrange a relief locomotive engineer for a late running train left TC1 at the desk without supervision. TC2's absence was understandable, based on his assessment gained during TC1's 8 weeks on-the-job training, the expected relatively short-duration of the absence and the clear instructions left with TC1.

7.5 Had more accurate information been exchanged between TC1 and TC2 at the subsequent mini hand-over when TC1 departed for his personal needs break it was unlikely that TC2 would have signalled the premature departure of Train 937 from Ashburton.

7.6 Had TC1 applied the blocking command to Signal 4LB, TC2 would have been prevented from authorising the departure of Train 937 from Ashburton while the HRV occupied the track section immediately south of Ashburton. However, while the use of the signal blocking command was good practice and regularly used, its use was not mandatory at the time of this incident.

8 Other relevant occurrences investigated by the Commission

Occurrence report 00-101, train control incidents, hi-rail vehicles and trains occupying the same section of track and a collision, various locations

8.1.1 Report 00-101 included 4 separate occurrences between 17 December 1999 and 5 September 2000 where train controllers had given authority for trains to enter a section of track already occupied by an HRV. Among the safety issues identified were: the repeated non-adherence to basic train control procedures covered in the operating code, and train controllers not using, nor being required to use, signal "blocking commands" as a defence against issuing conflicting instructions to track users.

8.1.2 On 17 January 2001 the Commission recommended to the Managing Director of Tranz Rail that he:

> as a matter of urgency make the use of signal blocking command "control tags" mandatory on signals controlling the entry of trains into sections occupied by HRVs, track maintenance gangs or other track users (125/00)

8.1.3 On 2 February 2001 the Managing Director of Tranz Rail advised that he accepted the safety recommendation.

Occurrence report 00-116, Train 225 and hi-rail vehicle occupying the same section of track, near Te Kauwhata

8.1.4 On 4 October 2000, Train 225 was given authority to depart Te Kauwhata and enter the down main line that was already occupied by an HRV. Among the safety issues identified were: a train controller not following procedures for handling track user inquiries, and not applying adequate safety measures to protect the HRV movement.

8.1.5 On 30 May 2001 the Commission repeated Safety Recommendation 125/00 to the Managing Director of Tranz Rail.

Occurrence report 02-118, near collision between Train 484 and hi-rail vehicle at Tauranga

8.1.6 On 7 August 2002 a train controller gave authority for Train 484 to depart Tauranga and enter a section of track already occupied by an HRV travelling towards the train. Among the safety issues identified were: incorrect procedures for handling track user inquiries, the non-application of signal "blocking commands" to protect the HRV movement and the absence of a site familiarisation visit before certification.

8.1.7 On 11 October 2002 the Managing Director of Tranz Rail advised that a Draft Track Occupancy Protection Rule would be trialled on selected routes. The rule stated in part:

> When occupancy of a section of track by a hi-rail vehicle is authorised by train control, blocking must be applied to protect the occupancy area and a Track Occupancy Permit prepared and transmitted to the Person In Charge. The "blocking" commands remain active until the Permit holder reports **clear of the line by the Designated Time**.

8.1.8 On 15 July 2003, the Commission recommended to the managing director that he:

> include a site familiarisation trip with the tutor train controller and an experienced operating or maintenance person as part of the training and certification for any train control desk together with at least one unaccompanied field trip scheduled within an acceptable time frame following certification as a follow up (007/03)

8.1.9 On 9 July 2003 Tranz Rail advised that it intends to review the site familiarisation process to introduce a more prescriptive process and will include the recommendation as part of the review.

9 Summary

9.1 All 3 incidents were the result of trains being given authority to enter a section of track that was already occupied by a work group or HRV. In each case the incidents were preventable had the train controllers used correct train control procedures.

9.2 The following deficiencies relating to the use of train control diagrams by train controllers were identified:

- lack of forward planning by plotting the projected paths of trains in pencil on the train control diagram
- lack of reference to the train control diagrams before clearing signals controlling the entry of trains into sections
- incorrect interpretation of information endorsed on the train control diagram relating to scheduled train movements and authorised HRV movements
- inaccurate recorded track occupancy details on the train control diagram.

9.3 Had the use of signal and TWACS blocking commands been mandatory, and had the requirements been followed, 2 of the 3 incidents would probably have been averted.

9.4 On 17 January 2001, and repeated on 30 May 2001, the Commission recommended to the Managing Director of Tranz Rail that he make the use of blocking commands mandatory.

Although Tranz Rail advised on 2 February 2001 that it accepted that recommendation, the mandatory use of signal blocking commands had not been fully introduced by Tranz Rail to date. Since February 2001 the Commission has completed 4 investigations and is currently investigating 2 more where the use of blocking commands might have prevented the incidents.

9.5 It is worth repeating Tranz Rail's Operating Code Section 6, Instruction 15 which stated in part:

> There is no margin for error, oversight or indifferent approach concerning the movement of trains, hi-rail vehicles or trolleys when handling inquiries from these members. Their safety depends on the accuracy of information supplied by train control…

10 Findings

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

02-129, express freight train 575, Midhirst, 4 December 2002

10.1 A clear proceed signal was given and a track warrant issued to the locomotive engineer of Train 575 authorising him to enter a section of track that was occupied by a track maintenance gang replacing a broken rail.

10.2 The train control diagram had little effect in preventing this occurrence because it:

- was inaccurate, incomplete, and did not accurately represent what was happening in the field
- had not been used as a tool for forward planning.

10.3 The ganger carried out the emergency work in compliance with Tranz Rail Operating Rules and in the belief that Train 575 would be held at Lepperton until the work was completed and the track made safe for the passage of trains.

10.4 The train controller marked off the ganger's track occupation as completed before he received confirmation from the ganger.

10.5 The use of the signal blocking command tag was a valuable defence that could have prevented this incident had it been maintained until the emergency work was reported complete.

10.6 Train 575 was being operated correctly at the time and did not contribute to this incident.

10.7 The incoming train controller who took the "off and clear" call from the ganger had just assumed responsibility for the desk and was unaware of the emergency work.

10.8 A collision was avoided only because the track gang had fortuitously cleared the track minutes before Train 575 passed through their worksite.

02-119, 84 shunt, Maimai, 29 August 2002

10.9 The train controller issued a track warrant to the locomotive engineer of 84 Shunt authorising him to enter a section of track that was already occupied.

10.10 The train control diagram did not correctly represent what was happening in the field. The train controller plotted the contractor's track occupation at Matai Intermediate Board whereas he had confirmed and authorised the track occupation at Maimai Siding.

10.11 The train controller gained certification on the train control desk, without the benefit of a field familiarisation visit, one week before the incident. His unfamiliarity with siding and station layouts on the Stillwater-Westport Line and the similar sounding location names of Maimai and Matai probably contributed to the plotting error.

10.12 The contractor carried out the maintenance in accordance with Tranz Rail's procedures and his actions did not contribute to the incident.

10.13 A collision was averted only because of the vigilance of the locomotive engineer who had approached the siding cautiously and was able to stop to stop his train before reaching the contractor.

02-128, Train 937, Ashburton, 21 November 2002

10.14 Train 937 was authorised to depart Ashburton and enter a section of track already occupied by an HRV travelling towards the train.

10.15 Although available, the signal blocking command was not mandatory and had not been used to protect the HRV track occupancy on this occasion.

10.16 For a few minutes the Main South Line train control desk was operated by an unqualified train controller without supervision during which time the incident was initiated.

10.17 The information given to the tutor train controller at the hand-over process led him to believe the HRV had cleared Ashburton south end points before he authorised the departure of Train 937 from Ashburton loop.

10.18 The locomotive engineer did not observe a proceed indication on the signal to depart Ashburton crossing loop. Although the crossing alarms began operating, the signal command was cancelled before Signal 4LB gave a proceed indication.

10.19 Neither the locomotive engineer nor the operator of the HRV contributed to the incident.

10.20 A potential collision was prevented only when the operator of the HRV alerted the tutor train controller to the fact that he was still in the section to which the train was being given authority to enter.

11 Safety Actions

11.1 On 5 December a Special Briefing paper was issued to all Train Controllers and Signal box staff dealing with on tracking of HRVs and protection of people working on track with machinery.

TRANZ RAIL

Special Briefing

On tracking of Hi Rail Vehicles: 05 December 2002

Action required – Please distribute a copy of this briefing to Train Control and Signalbox staff.

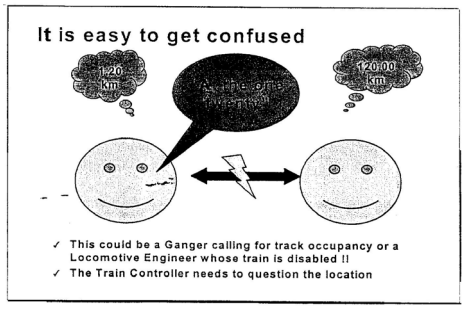
Recently there have been an increased number of incidents involving Hi Rail Vehicles and there have been various contributing factors leading to these incidents.

It is vital that a complete understanding of exactly what the Track user is requesting is understood and also that if the track inquiry is in a multi track area ie. within station limits or in double line areas, that it is clearly understood exactly which line (West loop, main, east loop, berthing roads, arrival and departure roads, sidings, Up or Down mains) that the work or Hi Rail vehicle movement will be on.

Please refresh your knowledge of the relevant Rules and Regulations regarding "on track" movements to clarify what is expected from both the Track user and the Signalman / Train Controller when dealing with on track movements.

Transfield Services are instructing their staff to write down the key points of the occupancy being authorised, ie on tracking location, off tracking location and the designated off tracking time. This information is to be repeated to Train Control or to the Signalbox concerned.

We all know there is no margin for error when dealing with people working on the track with machinery or Hi Rail Vehicles and it is important that we clarify exactly all information prior to allowing these occupations to proceed.



Network Control Manager
Rail Services Group

11.2 On 1 July 2003 Tranz Rail advised that:

Enhanced Track Occupancy procedures have been introduced.

These procedures essentially consist of four specific categories:

a) Protection by Track Warrant for hi-rail movements
b) Protection by signal blocking in CTC and DLAS territory for hi-rail movements.
c) Protection in SLAS territory for hi-rail movements.
d) Protection ITD: Individual Train Protection for authorised personnel when fouling mainlines and interlocked areas when moving on foot, making minor maintenance corrections or driving close to railway lines in these areas.

Additionally protection methods for work sites within all four operating systems have been strengthened by increased requirements for Conditional Stop Boards and specific procedures for multi-work sites.

IMPLEMENTATION PLAN
Implementation has taken place or is planned as follows:

a) Track Warrant

- Main North Line 17 March 2003 complete
- Marton-New Plymouth 17 March 2003 complete
- Stratford-Okahakura 17 March 2003 complete
- North Auckland Line 26 May 2003 complete
- Wairarapa Line October 2003
- Woodville-Gisborne October 2003
- Oamaru-Bluff October 2003
- Stillwater-Ngakawau October 2003

b) Signal "Blocking" – CTC / DLAS:

- Lyttelton-Oamaru complete
- Picton-Vernon complete
- Otaki-Marton-Woodville 4 August 2003
- Marton-Te Rapa 4 August 2003
- Wellington-Otaki 1 September 2003
- ECMT 1 September 2003
- Te Rapa-Waitakere 1 September 2003

b) SLAS:

- Rolleston - Stillwater 14 July 2003

This is an interim process introducing formalised cross checks using a specific authority similar to CTC/DLAS, specifically a formal acknowledgement from the hi-rail driver that a train can enter the authorised territory 15 minutes after the authorised "clear" time.

c) ITD: Individual Train Detection

This protection method will be introduced for infrastructure maintenance staff as follows:

- South Island 14 July 2003
- North Island 1 September 2003

Other rail personnel will be trained by end October 2003.

Full implementation of this standard is expected by 3 November 2003.

11.3 Under the new Track Occupancy Protection Rules, the term "Blocking" is referred to as a process of holding signals at stop to prevent train movements from entering a section of line.

- Signals controlling entry into sections where occupancies have been authorised are placed and held at 'stop'.
- The levers/controls concerned are tagged/collared or blocked to prevent the signals from being cleared.

In view of the actions taken by Tranz Rail no safety recommendation has been made.

Approved for publication 19 November 2003

Hon W P Jeffries
Chief Commissioner

Recent railway occurrence reports published by the Transport Accident Investigation Commission (most recent at top of list)

02-129 train control incidents, trains authorised to enter sections of track already occupied by hi-rail vehicles and work groups, various locations, 29 August 2002 – 4 December 2002

02-127 Train 526, track warrant overrun, Waitotara, 17 November 2002

02-120 electric multiple units, Trains 9351 and 3647, collision, Wellington, 31 August 2002

02-118 express freight Train 484, near collision with hi-rail vehicle, Tauranga, 7 August 2002

02-117 express freight Train 328 signal passed at stop, Te Rapa 31 July 2002

02-116 express freight Train 533, derailment, near Te Wera, 26 July 2002

02-112 passenger fell from the Rail Forest Express, Tunnel 29, Nihotupu Tramline, Waitakere, Saturday 4 May 2002

02-104 express freight and passenger trains, derailments or near derailments due to heat buckles, various localities, 21 December 2001 to 28 January 2002

02-113 passenger express Train 700 TranzCoastal and petrol tanker, near collision Vickerman Street level crossing, near Blenheim, 25 April 2002

02-107 express freight Train 530, collision with stationary shunt locomotive, New Plymouth, 29 January 2002

01-111 passenger EMU Train 2621, door incident, Ava, 15 August 2001

01-107 passenger baggage car Train 201, broken wheel, Otaihanga, 6 June 2001

01-112 Shunt 84, runaway wagon, Stillwater, 13 September 2001

01-113 DC4185 light locomotive and private car, collision, Egmont Tanneries private level crossing 164.14 km Stratford, 19 September 2001

01-109 passenger EMU Train 8203, doors open on EMU, Tawa, 16 July 2001

01-108 express freight Train 842, derailment, Otira Tunnel, 7 July 2001

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