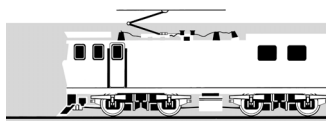
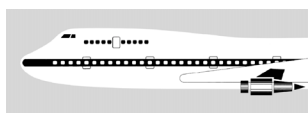


## RAILWAY OCCURRENCE REPORT

02-118

express freight Train 484, near collision with hi-rail vehicle,  
Tauranga

7 August 2002



TRANSPORT ACCIDENT INVESTIGATION COMMISSION  
NEW ZEALAND

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

**Abstract**

On Wednesday 7 August 2002, at about 1335, train control gave authority for westbound express freight Train 484 to depart Tauranga and enter a section of track already occupied by a hi-rail vehicle travelling towards the train.

Some minutes after the train departed, the train controller in-training realised he had set up a potential collision so he contacted the locomotive engineer and instructed him to stop the train. When the train stopped, about 300 m separated the train and the hi-rail vehicle.

The safety issues identified included:

- the incorrect procedures for handling track user inquiries
- the non-application of signal “blocking commands” to protect the hi-rail vehicle movement
- the training and certification of new entrant train controllers on additional train control desks soon after their initial certification
- the absence of a familiarisation site visit prior to certification on a train control desk.

Safety recommendations have been made to the managing director of Tranz Rail to address these issues.



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## Abbreviations

CTC	Centralised Traffic Control
ECMT	East Coast Main Trunk
HRV1	Hi-Rail Vehicle travelling towards Te Puna
HRV2	Hi-Rail Vehicle travelling towards Tauranga
km	kilometre(s)
m	metre(s)
t	tonne(s)
TC1	Train Controller in-training
TC2	Tutor Train Controller
Tranz Rail	Tranz Rail Limited
UTC	co-ordinated universal time

## Data Summary

<b>Train type and number:</b>	express freight Train 484 Hi-Rail Vehicle 33535
<b>Date and time:</b>	7 August 2002 at about 1335 <sup>1</sup>
<b>Location:</b>	95.1 km East Coast Main Trunk, near Tauranga
<b>Persons on board:</b>	Train 484            1 Hi-Rail                3 Vehicle
<b>Injuries:</b>	nil
<b>Damage:</b>	nil
<b>Operator:</b>	Tranz Rail Limited (Tranz Rail)
<b>Investigator-in-charge:</b>	P G Miskell

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





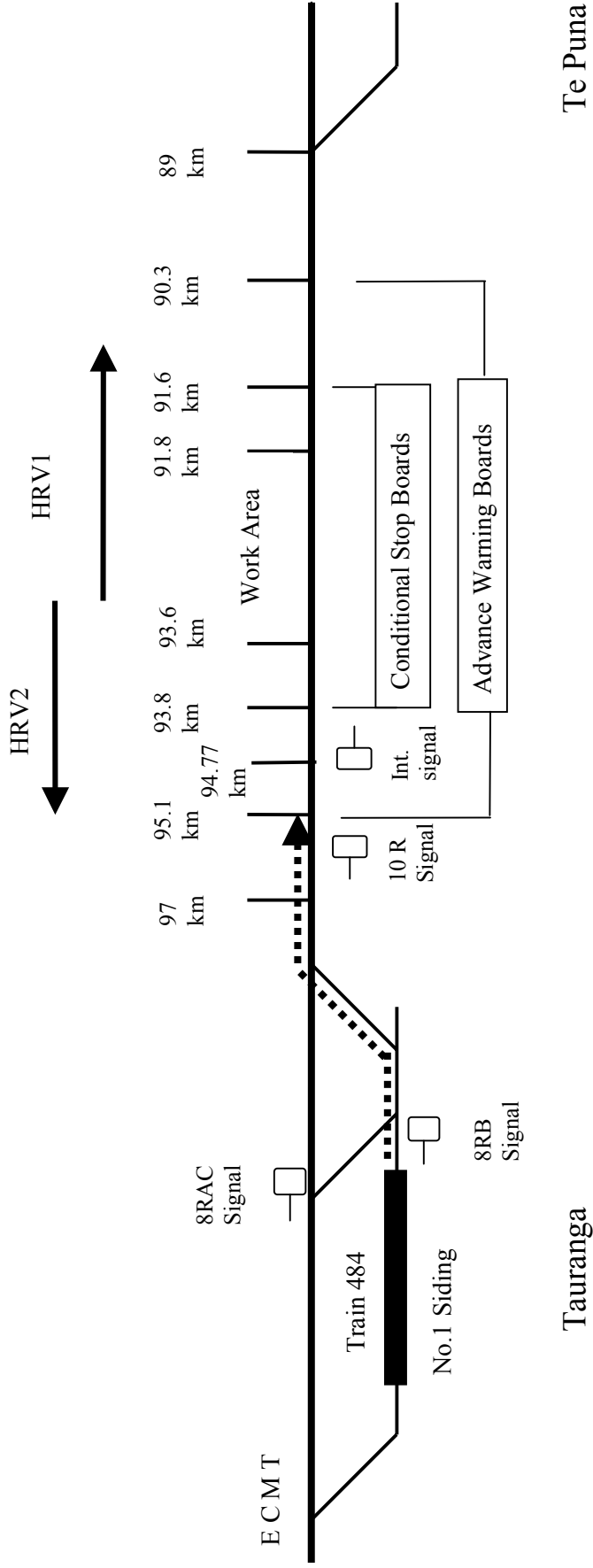
# 1 Factual Information

## 1.1 Narrative

- 1.1.1 On Wednesday 7 August 2002, Train 484 was a scheduled Mount Maunganui to Kinleith express freight service, consisting of a DF class locomotive hauling 30 wagons with a gross weight of 503 tonnes and length of 434 m. The train departed at 1239 and the train controller in-training (TC1), based on information from AMICUS<sup>2</sup>, routed it into No. 1 siding at Tauranga to uplift wagons and for a planned crossing with eastbound express freight Train 483.
- 1.1.2 At about 0800 that day a track gang started destressing the track between 91.80 km and 93.60 km, in the Te Puna-Tauranga section of the East Coast Main Trunk (ECMT). To protect the worksite and warn locomotive engineers, advance warning boards and conditional stop boards were erected on either side of the site. The work was completed and the gang cleared the track by about 1300.
- 1.1.3 At about 1305 the person-in-charge of the worksite authorised Train 483 to proceed through the worksite. After the train cleared the worksite, the person-in-charge contacted train control by radio at about 1320, and was granted authority for 2 hi-rail vehicles to on-track at 93 km; one hi-rail vehicle (HRV1) to travel west and off-track at Te Puna (88.58 km) and the other (HRV2) to travel east and off-track at Tauranga (97 km), both retrieving site protection boards and other equipment on the way. The authority was valid until the designated time of 1345. TC1 did not advise the person-in-charge that Train 484 was waiting in Tauranga and would be the next train into the Tauranga-Te Puna track section (see Figure 1).
- 1.1.4 At about the same time the attention of the tutor train controller (TC2) was temporarily diverted from his supervisory responsibility while he focused on the problem of Trains 357 and 354 crossing at Te Puke, leaving TC1 to deal with all other inquiries including Trains 483 and 484.
- 1.1.5 Train 483 crossed Train 484 at Tauranga at about 1325 and continued on to Mount Maunganui.
- 1.1.6 After Train 483 cleared Tauranga, the locomotive engineer of Train 484 called TC1 and requested authority to depart. TC1 confirmed with the locomotive engineer that he held no work orders to uplift wagons from Tauranga, before he cleared Signal 8RB and set the route for Train 484 to enter the Tauranga-Te Puna track section.
- 1.1.7 By this time HRV2 was travelling towards Tauranga. The driver of HRV2 saw a red indication on the Tauranga Down Station Intermediate signal located at 94.77 km. The red indication made the driver realise that the track section ahead was possibly occupied, so slowed his vehicle but went by the signal because it did not apply to HRV movements.
- 1.1.8 About 4 minutes after TC1 authorised Train 484 to depart Tauranga, he realised he had given the train authority to enter a section of track already occupied. TC1 discussed the situation with TC2 before instructing the locomotive engineer of Train 484 to stop immediately. When the train stopped, about 300 m separated the train and HRV2, which the driver had stopped when he saw the train.
- 1.1.9 The crew of HRV2 took down the advance warning board while the driver of HRV2 communicated with the locomotive engineer of Train 484 by radio. The driver of HRV2 then reversed his vehicle and off-tracked at 93 km.
- 1.1.10 Train 484 continued on to Kinleith after the locomotive engineer received confirmation from TC1 that both HRVs were clear of the track.
- 1.1.11 TC1 and TC2 were stood down from train control duties as soon as this incident was reported to the Train Control Manager. TC1 and TC2 resumed train control duties the following morning.

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<sup>2</sup> An online database containing information pertaining to train services.



**Figure 1**  
**Site plan of work area in Tauranga-Te Puna track section**  
 (not to scale)

## **1.2 Site and signalling information**

1.2.1 The track between Te Puna and Tauranga was single line and controlled by centralised traffic control (CTC) signalling, which was operated remotely from the national train control centre in Wellington.

### **Protection available within centralised traffic control**

1.2.2 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 was displayed on the train controller's monitor.

1.2.3 Within the CTC system a facility called "blocking" or "control tag" commands was available. This facility allowed the train controller to stop signals from being cleared, or particular points from being moved and ensured there was no inadvertent use of the equipment.

1.2.4 Signals 8RB and 8RAC at Tauranga were controlled signals and could be control tagged by the signal blocking command. However, the use of such blocking commands was not mandatory at the time of this incident.

1.2.5 TC1 stated he used the blocking command function when the track gang erected the advance warning and conditional stop boards, but he had not done so when the protection boards were taken down.

### **Planned work**

1.2.6 The planned work of destressing a section of track between 91.80 km and 93.60 km ECMT was carried out under Rule 905, Conditional Stop Protection. The destressing work was identified in the Network Operations Information Bulletin dated 6 August 2002 and was distributed to all operating staff affected by the Bulletin including train controllers, locomotive engineers and track staff.

1.2.7 Before commencing work the person-in-charge of the worksite established with train control that no trains were approaching the work site. TC1 authorised HRVs to on-track in order to erect the advance warning boards and conditional stop boards (see Figure 1).

1.2.8 When operating under Conditional Stop Protection, the person-in-charge of the worksite was in regular contact with train control to ensure the line was cleared at agreed times to minimise disruption to train services. The person-in-charge became controller of the worksite, and it was he who gave authority to locomotive engineers to pass the conditional stop boards when the track was safe to do so.

1.2.9 On the day of the incident, the person-in-charge temporarily cleared the line on 4 separate occasions to permit the passage of trains through the worksite.

## **Train control procedures for handling track user inquiries**

### 1.2.10 Tranz Rail Operating Code Section 6 Instruction 15.0; **Inquiries from Maintenance Workers, Hi-Rail Vehicle and Trolley Users** stated in part:

#### **15.1 Accurate and Up-dated 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 enquiries from these members. Their safety depends on the accuracy of information supplied by the Train Controller and there should be no possibility of misunderstanding by the inquirer. Abbreviated speech or short cuts in procedure must not be adopted by a Train Controller when handling these inquiries.

The following matters must be watched carefully by a Train Controller when dealing with the movement of Hi-Rail vehicles, trolleys and maintenance work:

##### **15.1.1 Summary of Procedures – Track Occupancy Rules 908 & 915**

Once track occupancy request details have been established the authorisation process is:

- Plot the movement on the train control graph.
- Execute required protection and 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.

##### **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 which is about to be authorised.

Should a conflict with an existing occupation or track maintenance machine exist the caller must be advised so that the arrangements can be made to pass through the area concerned.

### 15.1.3 Designated Time-Safety Buffer

For occupations the designated time **MUST** include a minimum safety buffer of fifteen minutes before the anticipated arrival time of the next train **EXCEPT** where physical protection is established. i.e. conditional stop boards, detonators, signals held at stop...

The Train Controller must provide the caller with the most up to date information in regard to the next train or trains (when it is unsure which will arrive first).

A Train **MUST NOT** be dispatched into an area inside the 15 minute buffer unless “off track and clear” has been received from the Track User.

#### 1.2.11 Tranz Rail’s Engineering Rule 915 (d) stated:

If, after authorising an on track movement circumstances alter which would allow a train to conflict with the agreed designated time, Train Control must arrange to hold back that train, until the person in charge has advised the movement is clear of the line or the designated time has elapsed.

### Planning of train movements

#### 1.2.12 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 to 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.

### 1.3 Crossing of Trains 354 and 357 at Te Puke

1.3.1 At about 1245, Trains 357 and 354 were attempting to cross at Te Puke station. Both trains were long and could not be positioned between the fixed signals on the mainline and the crossing loop in such a way that the signals could be properly set to complete the crossing.

1.3.2 TC2 consulted with the locomotive engineer from each train and local staff responsible for the maintenance of signals. On-site staff confirmed that there was sufficient space for the trains to cross safely, so TC2 authorised the hand winding of the north end mainline points and permitted Train 354 to pass the Up starting signal at stop at about 1330.

### 1.4 Personnel

#### Locomotive engineer of Train 484

1.4.1 The locomotive engineer on Train 484 had almost 40 years operating experience with Tranz Rail and held current certification for the duties he was performing.

#### Hi-rail vehicle driver

1.4.2 The driver of HRV2 had more than 27 years track maintenance experience. He was an appointed ganger and held current Level C<sup>3</sup> operating certificate.

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<sup>3</sup> Minimum qualification to operate a hi-rail vehicle.

## **Train controller in-training (TC1)**

- 1.4.3 TC1 started work with Tranz Rail on 11 March 2002, after completing the 12 pre-employment train control modules. He then had an initial 2-week supervised induction course that was specifically designed to expose trainee train controllers to the various signalling systems and the operating environment. These site visits also provided an insight as to how their decisions as future train controllers would affect train operations.
- 1.4.4 On 6 May 2002, after 4 weeks at the train control school and having passed his interim and final examinations, TC1 started on-the-job training on the combined Hawkes Bay and North Auckland desk. He attained certification for solo operation on this desk on 3 July 2002 after a total of 9 weeks training, with 6 different tutors.
- 1.4.5 Tranz Rail advised that as part of the on-the-job training, the trainee was required to complete a locomotive cab ride through the area being learned. However, TC1 achieved certification without undertaking a cab ride or completing an area familiarisation field trip to either Hawkes Bay or North Auckland.
- 1.4.6 Tranz Rail advised that the period of time between initial certification and learning a new train control desk was generally 6 months but this time could be varied depending on the train controller's demonstrated ability and safety performance. TC1 started training on a new desk, the East<sup>4</sup> desk, after 2 days solo operation on the desk where he gained his initial certification.

## **Tutor train controller (TC2)**

- 1.4.7 TC2 had 29 years experience with Tranz Rail and had been a train controller for the last 15 years. He held current certification for the East desk, and was in his first week of a 3-week training assignment working with TC1 on a one-on-one basis.
- 1.4.8 Although TC2 was an experienced train controller he had only recently participated in the tutoring programme. He had successfully taken another trainee controller through to certification on the East desk and spent short periods with 2 other trainees on a South Island desk.
- 1.4.9 The selection of train controllers to undertake tutoring responsibilities was made by the Train Control Manager after considering their willingness to tutor, communication skills, job performance and experience.
- 1.4.10 Tranz Rail developed 2 on the job training manuals; one for the tutor and one for the trainee, to equip train controllers for their additional training responsibilities. These manuals were available some time after 26 June 2002. TC2 received his copy of the manual the day after this incident. However, check sheets were available to record the trainee's progress at weekly intervals.
- 1.4.11 Although the in-training TC1 was a certified controller and at the time operating the desk, TC2 still retained responsibility for all decisions and actions taken.

## **1.5 Rostering**

- 1.5.1 Tranz Rail's policy for rostering stipulated that train controllers are to be rostered for a maximum of 10 consecutive shifts and up to 85 hours per fortnight. However, controllers may work a maximum of 12 consecutive shifts and up to 110 hours in a fortnight.

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<sup>4</sup> All lines east of Hamilton including; ECMT, Cambridge Branch, Kinleith and Murupara Branch Lines.

- 1.5.2 TC1 worked an 8 hour 10 minute late shift from 2250 until 0700 for 5 days commencing 29 July. He was rostered on the Monday to Friday shift from 0700 to 1500 the following week, which included the day of the incident.
- 1.5.3 TC2 worked on 13 of the 14 days during the fortnight ending 3 August for a total of 103 hours.
- 1.5.4 On the day of the incident TC2 was on his third day of a fortnightly roster which included 12 consecutive shifts for a total of 101.5 hours. Although stood down after the incident nearing the end of a shift, he resumed tutoring and completed the fortnight as rostered, totalling 103 hours. TC2 worked 16 of the 18 days up to and including the day of the incident. His hours of duty are summarised in the following table:

Day	Date	Shift Hours	Hours Worked	Total hours/ fortnight (Sunday-Saturday)
Sunday	21 July	1300-1530	2.30	103
Monday	22 July	1450-2330	8.40	
Tuesday	23 July	1450-2330	8.40	
Wednesday	24 July	1450-2330	8.40	
Thursday	25 July	1450-2330	8.40	
Friday	26 July	1450-2330	8.40	
Saturday	27 July	Off duty		
Sunday	28 July	0650-1500	8.10	
Monday	29 July	0650-1500	8.10	
Tuesday	30 July	0650-1500	8.10	
Wednesday	31 July	0650-1500	8.10	
Thursday	1 August	0650-1500	8.10	
Friday	2 August	0650-1500	8.10	
Saturday	3 August	0650-1500	8.10	

Sunday	4 August	Off duty	
Monday	5 August	0700-1500	8.00
Tuesday	6 August	0700-1500	8.00
Wednesday	7 August	0700-1500	8.00 (Incident)

## 1.6 Other relevant occurrences investigated by the Commission

### Occurrence report 00-123, Train 3130 and Train 3134, collision, Ellerslie

- 1.6.1 In December 2000, two diesel-multiple units collided at Ellerslie. Among the safety issues identified were: the training and certification of new entrant train controllers on additional train control desks soon after their initial certification, and the absence of an area familiarisation site visit before certification.
- 1.6.2 On 29 October 2001 the Commission recommended to the Managing Director of Tranz Rail that he:

ensure that following initial training and certification, new entrant controllers do not commence training on another train control desk until they have completed at least 12 months duty on their first train control desk (043/01) and

include an area familiarisation trip with an experienced train controller or similarly qualified person as part of the training and certification for any train control desk together with an unaccompanied field trip scheduled within an acceptable timeframe following certification as a follow up (044/01).

1.6.3 On 22 November 2001 the managing director of Tranz Rail replied:

043/01 Tranz Rail does not accept this recommendation in its present form. The report provides no basis for arriving at a minimum period of twelve months for a new Train Controller on their initial desk. However, as suggested in our response to the preliminary recommendation, Tranz Rail intends to gather information from overseas railway organisations with similar Train Control systems regarding their approach to this matter with a view to establishing a minimum period based on industry practice.

044/01 Tranz Rail does not accept this recommendation. A recommendation that changed "...with an experienced train controller or similarly qualified person..." to "...with experienced operating and/or maintenance personnel..." would be acceptable. This suggested change is prompted by Tranz Rail's firm belief that Train Controllers are best to have field visits with experienced field practitioners.

### **Occurrence report 00-113, Train 378, derailment, Te Maunga**

1.6.4 On 22 July 2000, Train 378 derailed at Te Maunga. Among the safety issues identified were non-adherence to basic train control techniques, and operating irregularities involving train controllers.

1.6.5 Resulting from a recommendation by the Commission to the Land Transport Safety Authority, a review of train control operations was carried out by Rail Maintenance Pty Ltd in October 2001.

1.6.6 The review commented that learning a single desk usually took a minimum of one full roster cycle so there is exposure to all shifts. An analysis of the training records showed that initial certification was achieved within a range of 3 to 8 weeks, although the majority of trainees completed their on-the-job training within 4 to 6 weeks. The review concluded:

- Consolidation of learning a single desk takes 6-12 months and should have priority over learning additional desks.
- Field trips should continue through the training phase to consolidate learning and then be continued yearly and include travel on hi-rail movements.

1.6.7 The focus of safety recommendations 043/01 and 044/01 is relevant to this investigation. The recommendations, amended to reflect Tranz Rail's response and review of train control operations have been made to the managing director of Tranz Rail.

### **1.7 National train control centre**

1.7.1 Centralisation of the train control function to Wellington was completed during 1999. Nationwide train control duties were carried out from 9 separate desks. The system comprised networked computers for signalling and a computer-based radio system that allowed train controllers to communicate with locomotive engineers and other track users operating within their respective areas.



- 1.7.2 The computer-based systems were designed to allow train control areas to be transferred between desks within the train control centre to meet workload demands. This system offered flexibility and allowed staff numbers to be reduced during periods of low activity, particularly at weekends, when several areas could be consolidated onto a single train control desk.
- 1.7.3 At the time of this incident Tranz Rail was in discussion with train controllers, proposing to relocate the National Train Control Centre from Wellington to Auckland. A limited number of Wellington-based controllers including TC1 expressed a willingness to move to Auckland. It was Tranz Rail's stated intention that TC1 would eventually operate one of the northern area desks although gaining initial certification on a central area desk.

## **2 Analysis**

- 2.1 The near collision occurred because TC1, who was under training on the East desk, allowed Train 484 to enter a section of track occupied by HRV2, which had previously been authorised to occupy the same section.
- 2.2 At the time, TC1 was operating unsupervised because his tutor was preoccupied with a problem on another section of line.
- 2.3 Had TC1 properly plotted the anticipated movements of HRV2 and Train 484 he would probably have kept Train 484 in Tauranga until the section was clear.
- 2.4 Had TC1 used the blocking command system available to him, he would not have been able to change the signals or points allowing Train 484 to proceed.

### **Training**

- 2.5 On completion of his initial training and certification, TC1 had 2 days sole-charge train control experience on the North Auckland/Hawkes Bay desk before he commenced on-the-job training on the East train control desk. Having been recruited as a train control trainee from outside Tranz Rail, he entered train control school with his rail industry knowledge limited to that gained while completing the pre-employment train control modules. At this stage, despite the intention to train him on a northern area desk it would have been appropriate for him to remain on the North Auckland/Hawke's Bay desk to consolidate his training by experience.
- 2.6 Centralisation of Train Control allowed staff levels to be reduced by combining desk operations when traffic levels were less dense, for example at weekends. The reduction in staff numbers was made possible by the flexibility that resulted when all staff operating the roster were certified for each train control desk within their respective roster. Therefore, until train controllers had completed certification on all desks within their roster, they could not be rostered for multiple desk shifts. Why Tranz Rail commenced training TC1 on a second desk with such urgency was not clear, but may in part have been a need to have him trained on multiple desks in preparation for the relocation of Train Control to Auckland. Tranz Rail probably had the need to accelerate the training of new train controllers for the northern area desks because some of the current northern area controllers were unwilling to relocate to Auckland.
- 2.7 TC1's inexperience in the rail industry and his unfamiliarity with the North Auckland and Hawke's Bay lines greatly increased the need for an area familiarisation trip as part of his on-the-job training. At the time of this incident, TC1 had not been given the opportunity to undertake a field trip on any of the lines for which he held certification or was currently learning.

## **Tauranga**

- 2.8 Train Control processes and procedures did not vary significantly from desk to desk. Although TC1 was technically a trainee on the East desk, he was a fully certified train controller competent in duties such as plotting, operating the train control radio, protecting work groups and authorising HRV movements.
- 2.9 When TC1 handled the request for HRV occupation between Te Puna and Tauranga, there were 3 safety critical omissions, namely:
- the driver of HRV2 was not advised of the location of Train 484, the next train movement into the section
  - the pencil planning plot line for Train 484 was not drawn on the Train Control Diagram
  - the blocking command was not used to prevent the inadvertent release of the signals at Tauranga.
- 2.10 Had the driver of HRV2 been aware of Train 484, he would have been alerted to the possibility of an opposing train movement and contacted TC1 when he observed a red aspect on the Tauranga Down station intermediate signal.
- 2.11 Had TC1 previously plotted the planned path of Train 484 in pencil, when he drew the line representing the path of HRV2, it would have crossed the planned path of Train 484. This would have immediately alerted TC1 that the train was waiting at Tauranga.
- 2.12 Had TC1 used the blocking commands when he authorised the HRVs to on-track to recover the protection boards, his efforts to clear Signal 8RB for the departure of Train 484 would have been unsuccessful and brought his attention to the presence of the HRV2 in the section ahead. Although not mandatory, the use of the signal blocking command offered an additional and effective defence against potential conflicting movements.
- 2.13 TC1 routed Train 484 into the No. 1 Siding, Tauranga, because AMICUS incorrectly reported the train had 4 wagons to uplift at Tauranga. Had he been aware Train 484 did not need to stop at Tauranga he probably would have advanced it to Te Puna to cross Train 483.
- 2.14 TC1 was probably taken by surprise when informed by the locomotive engineer of Train 484 that the train was ready to depart after Train 483 had crossed. After confirming with the locomotive engineer of Train 484 that he had no wagons to uplift, TC1 immediately set the route for the train to depart, probably without reference to his Train Control Diagram. Had TC1 made the check, and plotted the line for Train 484 before clearing the Tauranga departure signals, the conflicting plot lines of the HRV occupations and the train movement would have become obvious and he would not have authorised the departure of Train 484 until the HRVs had reported clear of the track.

## **Te Puke**

- 2.15 The problems encountered crossing Trains 354 and 357 at Te Puke did not contribute directly to the near collision incident at Tauranga, but did divert TC2's attention from his tutoring role.
- 2.16 Had TC2 been able to concentrate on tutoring TC1, he may have identified and corrected TC1's departures from train control procedures that led to the incident at Tauranga.

- 2.17 TC2 focused on the problems with the Te Puke crossing to the exclusion of other tasks. Such channelled attention can be indicative of fatigue related impairment. Although TC2 was on his third shift since an off-duty day, he had worked 16 of the previous 18 days and the lack of recuperative time off may have contributed to such fatigue. His ongoing roster after the incident meant that he was rostered and worked a total of 12 consecutive days. Such a roster poses a risk of fatigue as identified by Tranz Rail.

### 3 Findings

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

- 3.1 The near collision occurred when Train 484 was authorised to enter a section of track already occupied by authorised vehicles.
- 3.2 When authorising Train 484 to depart Tauranga, TC1's attention was not drawn to the presence of the other vehicles because of insufficient detail on the train control diagram, and he did not conduct a pre-authorisation check nor plot the intended movement.
- 3.3 Although the use of the signal blocking command was not mandatory, had TC1 used it he would not have been able to signal the train to proceed and, therefore, the incident would have been prevented.
- 3.4 All staff were certified for the duties being carried out.
- 3.5 TC1 was not sufficiently experienced in train control duties before he started training on a second train control desk.
- 3.6 The actions of the locomotive engineer of Train 484 and the driver of HRV2 did not contribute to the near collision.
- 3.7 The number of consecutive shifts in TC2's roster exceeded Tranz Rail's policy and may have lead to fatigue.
- 3.8 Tranz Rail had no effective monitoring system to control the train control roster.

### 4 Safety Actions

- 4.1 On 11 October 2002, Tranz Rail advised that a draft track occupancy protection process, governing the movement of HRVs, had been developed that included compulsory use of track warrant and signal blocking. Technology software changes would be required before starting a pilot study on selected routes.
- 4.2 An evaluation of the revised track occupancy procedures had been completed and full implementation including mandatory use of signal blocking command was scheduled for June 2003.
- 4.3 Tranz Rail's revised Track Occupancy Protection rule stated:

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**.

## 5 Safety Recommendations

5.1 On 15 July 2003, the Commission recommended to the Managing Director of Tranz Rail that he:

5.1.1 ensure that following initial training and certification, new entrant controllers do not commence training on another train control desk until they have completed at least 6 months duty on their first train control desk (006/03).

5.2 On 9 July 2003, the Managing Director of Tranz Rail responded to the Preliminary Safety Recommendation, which was subsequently adopted unchanged as the Commission's Final Safety Recommendation:

Tranz Rail has reviewed the draft report and preliminary safety recommendations and accepts this recommendation. It is assumed this replaces 043/01.

5.3 On 15 July 2003, the Commission recommended to the Managing Director of Tranz Rail that he:

5.3.1 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 timeframe following certification as a follow up (007/03).

5.4 On 9 July 2003, the Managing Director of Tranz Rail responded to the Preliminary Safety Recommendation, which was subsequently adopted unchanged as the Commission's Final Safety Recommendation:

Tranz Rail intends to review the site familiarisation process to introduce a more prescriptive process. This recommendation will be considered as part of this review.

5.5 On 15 July 2003, the Commission recommended to the Managing Director of Tranz Rail that he:

5.5.1 critically review policy for train control rosters with respect to allowable numbers of consecutive shifts and hours worked to ensure:

- mini rosters are controlled within defined criteria compatible with the principles used in compiling base rosters.
- defined criteria are met before offering additional shifts to train controllers.
- actual hours are monitored and immediate corrective action taken when factors increase rostered shifts beyond acceptable limits (008/03).

5.6 On 9 July 2003, the Managing Director of Tranz Rail responded to the Preliminary Safety Recommendation, which was subsequently adopted unchanged as the Commission's Final Safety Recommendation:

Tranz Rail accepts this recommendation.

Approved for publication 30 July 2003

Hon W P Jeffries  
Chief Commissioner







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Transport Accident Investigation Commission  
P O Box 10-323, Wellington, New Zealand  
Phone +64 4 473 3112 Fax +64 4 499 1510  
E-mail: [reports@taic.org.nz](mailto:reports@taic.org.nz) Website: [www.taic.org.nz](http://www.taic.org.nz)

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ISSN 0112-6962