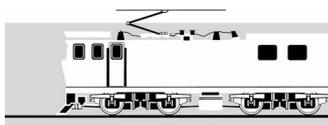
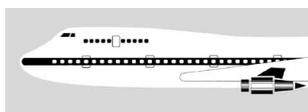


## RAILWAY OCCURRENCE REPORT

04-118      Report 04-118, express freight Train 725, track occupation      20 July 2004  
irregularity leading to a near collision, Tormore-Scargill



TRANSPORT ACCIDENT INVESTIGATION  
COMMISSION  
NEW ZEALAND

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**Report 04-118**  
**express freight Train 725**  
**track occupation irregularity leading to a near collision**  
**Tormore-Scargill**  
**20 July 2004**

**Abstract**

On Tuesday 20 July 2004, at 1345, Train 725, a Picton to Christchurch express freight service, was authorised to travel through the Tormore to Scargill section of the Main North Line that was already occupied by a track maintenance gang.

Two track maintenance personnel had just completed their work and were stowing equipment on their vehicle parked trackside when the train travelled through their worksite.

There were no injuries or equipment damage.

Safety issues identified included:

- the certification process for trainee train controllers
- conflicting documentation relating to safety buffer, clearance of occupations and safeguarding of positions when circumstances alter,

Two safety recommendations have been made to the Chief Executive of ONTRACK<sup>1</sup> to address these issues.

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<sup>1</sup> Access provider and controller of the controlled rail network since 1 September 2004.



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## **Abbreviations**

CTC	centralised traffic control
DLAS	double line automatic signalling
ITD	individual train detection
km	kilometre(s)
MNL	Main North Line
NZRC	New Zealand Railways Corporation
OJT	on-the-job training
RSV	rail service vehicle
TWACS	track warrant assisted computer system
TWC	track warrant control
UTC	coordinated universal time

## Data Summary

<b>Train type and number:</b>	express freight Train 725
<b>Date and time:</b>	25 July 2004, at 1345 <sup>2</sup>
<b>Location:</b>	99.5 km Main North line (MNL), between Tormore and Scargill
<b>Persons on board train:</b>	1
<b>Persons at worksite:</b>	2
<b>Injuries:</b>	nil
<b>Damage:</b>	nil
<b>Operator:</b>	New Zealand Railways Corporation (NZRC)
<b>Investigator-in-charge:</b>	V G Hoey

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<sup>2</sup> All times in this report are New Zealand standard times (UTC+12) and are expressed in the 24-hour mode.



# 1 Factual Information

## 1.1 Narrative

- 1.1.1 On Tuesday 20 July 2004, at about 1325, a Transfield Services<sup>3</sup> track ganger and track maintainer arrived by road at 99.5 km between Tormore and Scargill on the MNL to repair a track geometry exceedance that had been detected by the track evaluation car<sup>4</sup> earlier in the day.
- 1.1.2 The track ganger performed an individual train detection<sup>5</sup> (ITD) safety check to determine if he and the track maintainer could undertake the track occupancy under their own protection. Because the ITD criteria of clear vision and hearing ability could not be complied with, the track ganger advanced the status of the occupation to a foul time<sup>6</sup> request (see Figure 1).



**Figure 1**  
**Worksite at 99.5 km, looking north (left) and south (right)**

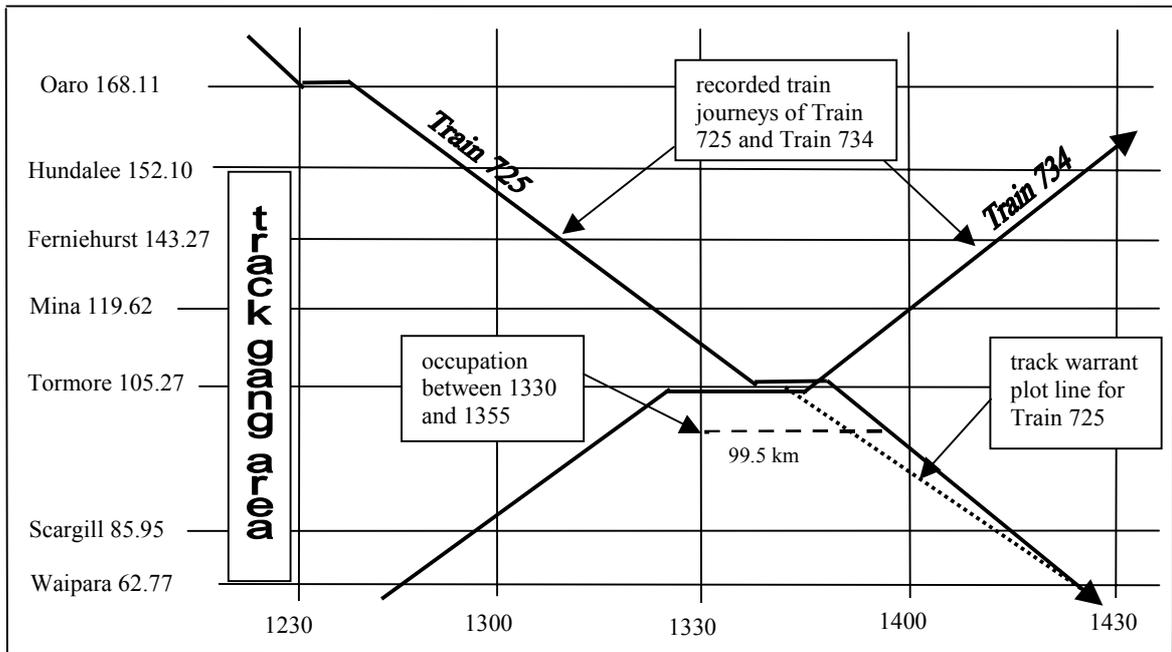
- 1.1.3 At about 1332, the track maintainer radioed train control and requested a 30-minute foul time occupation. The call was taken by a trainee train controller who was undergoing assessment by a network control manager for his initial desk certification.
- 1.1.4 The trainee train controller authorised a foul time occupation until 1355, and recorded the track occupation on the train control diagram. The trainee train controller advised the track maintainer that Train 725, the next service through the area, had departed Oaro at about 1240 (see Figure 2). The track maintainer confirmed the termination time of the occupation was 1355.
- 1.1.5 At about 1342, after the locomotive engineer of Train 725 had berthed his train on the loop at Tormore and had crossed Train 724, he requested an ongoing track warrant from the trainee train controller. The trainee train controller plotted the limits of the track warrant authority, and although the plot line intersected with the recorded track occupation at 99.5 km he issued track warrant No. 80 to the locomotive engineer at 1345. Train 725 departed Tormore at about 1346.

<sup>3</sup> Transfield Services was responsible for the inspection, maintenance and renewal of the rail infrastructure.

<sup>4</sup> The track evaluation car measured and recorded track geometry and identified track conditions beyond tolerance.

<sup>5</sup> ITD allowed for a person(s) performing light work on or near the track to protect themselves using visual and aural detection for approaching trains.

<sup>6</sup> Foul time occupations were used in circumstances where ITD could not be used safely.



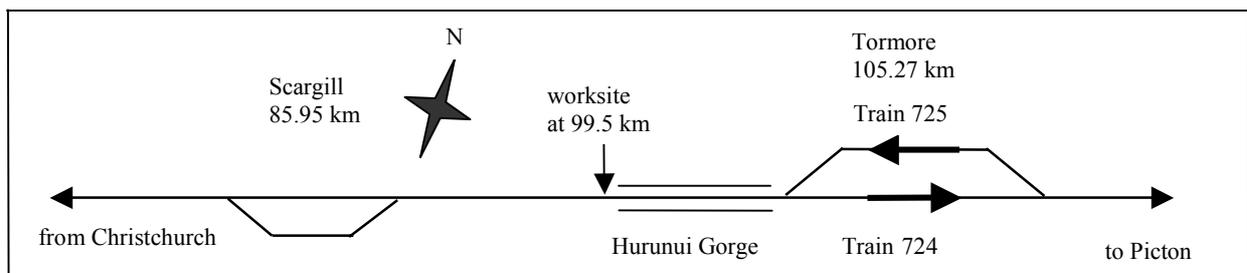
**Figure 2**

**Information recorded on the train control diagram after Train 725 had travelled south of Waipara (not to scale)**

- 1.1.6 At about 1350, the network control manager obtained a handover from the trainee train controller to allow him to have a personal needs break.
- 1.1.7 At about 1355, the track ganger and the track maintainer completed their tasks and were stowing their equipment on their truck when they heard Train 725 approaching. Immediately the train passed the worksite, the track ganger contacted train control and expressed surprise that the train had arrived before he had terminated their occupation.
- 1.1.8 The network control manager had just completed the handover of the desk to the incoming train controller when he answered the call from the track ganger. The incident was then reported to the train control manager.

**1.2 Site information**

1.2.1 The MNL between Christchurch and Picton was single line over a distance of 347.60 km. Train movements and track occupations on the line were controlled from the national train control centre in Wellington. Proportionally, track warrant control (TWC) was the principal operating system on the line. Immediately south of Tormore the MNL traversed the Hurunui Gorge (see Figure 3).



**Figure 3**

**Track layout between Tormore and Scargill (not to scale)**

## 1.3 Personnel

### Trainee train controller

- 1.3.1 During 2003, the trainee train controller immigrated to New Zealand with overseas rail industry experience as a signalman. After he had completed a train control correspondence course in December 2003, he attended the train control school in Woburn during April and May 2004. The 6-week course included both theory and practical training together with field trips to observe track occupation practices.
- 1.3.2 The trainee train controller commenced his on-the-job training (OJT) on the MNL desk on 17 May 2004. During the 9 weeks of his OJT, he was tutored by 6 different certified train controllers. He undertook a field trip to the MNL between 14 and 18 June 2004.
- 1.3.3 On the day before the incident, the trainee train controller sat and passed 3 written examinations covering TWC and centralised traffic control (CTC) signalling systems, and local conditions affecting train operations on the MNL. Additionally he sat an on-line TWC examination that tested his knowledge of the track warrant assisted computer system<sup>7</sup> (TWACS). He passed all 4 papers.
- 1.3.4 On the day of the incident, the trainee train controller was being assessed for certification to operate the MNL desk, his first desk. Both he and the network control manager who was to certify him commenced duty at 0630 and the trainee train controller took control of the desk at this time.
- 1.3.5 The trainee train controller said that he found the day busy with a higher number of track warrants than usual being issued because of the running of the track evaluation car. During the day, he sought and obtained from the network control manager clarification on the application of the 15-minute buffer for foul time occupations in TWC areas.
- 1.3.6 The trainee train controller later said that during breaks in his tasks at the desk, the network control manager posed many questions relating to special event scenarios that were unlikely to occur during the shift. As a result the trainee train controller said he spent the whole of the shift at the desk without an opportunity for a break until after 1350 when it was planned for him to attend a debriefing with the network control manager and the train control manager to discuss his certification.
- 1.3.7 The trainee train controller had just been relieved when the track ganger notified the network control manager of the incident.

### Network control manager

- 1.3.8 The network control manager had extensive train control experience on all South Island lines, which included the MNL. He was appointed as a network control manager in November 2002. To retain current certification, he underwent a desk audit on 13 April 2004, and a tape playback audit on 16 June 2004. Both assessments had been conducted while he was in control of the Midland Line desk.
- 1.3.9 As part of the trainee train controller's certification process, the network control manager said that he had observed tasks being performed during the shift and asked questions relevant to train operations on the MNL to test the trainee's knowledge. The network control manager was using a desk safety observation sheet for the certification and he was required to record either a meets requirements (MR) or needs attention (NA) comment on each task observed or scenario event.

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<sup>7</sup> TWACS was the system where train controllers could prepare, store and issue track warrants.

- 1.3.10 By about 1230 the network control manager was satisfied with the overall performance of the trainee train controller and was ready to recommend certification to the train control manager. However, the incoming train controller was late arriving so the network control manager departed the office to prepare some paperwork for the final scenario exercises to complete the certification process.
- 1.3.11 The network control manager recalled hearing the trainee train controller authorising the track occupation at 1332, but could not recall track warrant No. 80 being issued to the locomotive engineer of Train 725 at Tormore at 1345.
- 1.3.12 At about 1350, the trainee train controller handed the desk over to the network control manager. After this was completed, the network control manager answered the call from the track ganger regarding the incident.

### **Track ganger**

- 1.3.13 The track ganger had about 30 years' track maintenance experience, all in the north Canterbury area. He had lived and worked from Mina all his working life. His area of responsibility was from Hundalee to Waipara, a distance of about 89 km (see Figure 2).
- 1.3.14 On the day of the incident, the track ganger said he joined the track evaluation car at Waipara and travelled to Hundalee as it was measuring and recording the track condition of the MNL between Christchurch and Picton.
- 1.3.15 At Hundalee the track ganger alighted from the track evaluation car and took with him a computerised printout listing a number of locations where the track geometry was outside maintenance tolerance. A track maintainer met him and together they travelled by road to 99.5 km, between Tormore and Scargill, the first identified location they planned to correct that day.
- 1.3.16 The nature of the track geometry exceedance required the use of portable machines to lift a low rail joint. The unmuffled noise generated by the small internal combustion engines that powered each machine made it necessary to wear earmuffs. The track ganger and track maintainer each operated their own machines and because their vision of approaching trains was also impeded, the track ganger asked the track maintainer to request a foul time occupation from train control.
- 1.3.17 The track ganger said that while driving to 99.5 km, he saw Train 724 stationary on the main line at Tormore, but had not seen Train 725. The track ganger said that it was his understanding from the track maintainer that when he had received the track occupation authorisation, he had an uninterrupted track occupation until 1355 by which time he was to clear the track and inform train control that they had terminated their occupation.
- 1.3.18 When the track ganger and track maintainer had finished their work, they removed their earmuffs and immediately heard Train 725 approaching through the Hurunui Gorge, a short distance away. When the train passed, the track ganger phoned train control and expressed his surprise that Train 725 had arrived before he had terminated the occupation.

## **1.4 Locomotive event recorder**

- 1.4.1 The locomotive event recorder was not downloaded following the incident.

## 1.5 Induction, certification and monitoring of employee competence

1.5.1 NZRC's Operating Code Section 1, Instruction 5.2.7 **Train Controllers** stated in part:

### **On the Job Training**

The trainee Train Controller is then assigned to AN 'OJT' Tutor who will be a qualified Train Controller experienced in the area being learned. [emphasis added]

### **Certification**

On receipt of a recommendation from the Training Tutor and completion of the Training Specification, the Trainee will undergo formal certification to operate which consists of:

### **Written Examination**

Achieving an 80% pass mark in each examination covering the required disciplines, which the Trainee requires knowledge of to operate, e.g. CTC, TWC, DLAS etc. This will be a closed book examination.

### **Practical Assessment**

Operating a shift(s) under the supervision of the Train Control Manager to assess the Trainee's handling of track calls, technical competence with systems and compliance with Operating Codes, Procedures, Rules and Instructions. The safety observation sheet is used and associated key tasks are assessed.

1.5.2 ONTRACK<sup>8</sup> management advised that for the purposes of the practical assessment, a trainee train controller was considered to be competent and the assessment process was designed to confirm that. This consideration was based on a trainee train controller having been judged ready for assessment by the OJT trainers and having passed the written examinations. However, there was no process in place to recognise a trainee train controller's competence or allow the trainee to take full charge of a train control desk. Therefore the only certified train controller on the desk was the assessor.

1.5.3 Historically, assessments had taken about 4 hours and any scenarios not encountered in that time were tested by questioning after the assessment. Recent practice, however, had tended to include testing of all scenarios not encountered during the shift, by questioning during quiet parts of the shift.

1.5.4 The change in practice was not reflected in a change to the operating instructions. However, following the incident, ONTRACK management reassessed the certification process and issued a draft amendment to the Rail Operating Code Section 1, Instruction 5.2.7, Train Controllers (see Section 4 in this report).

## 1.6 Track occupancy protection rules

1.6.1 On 17 March 2003, new track occupancy protection rules were introduced, initially on a trial basis, in the TWC area on the MNL. After an extended trial period, the new rules were implemented as standard procedures. The new procedures required the person in charge of a worksite to assess the appropriate level of protection to ensure a safe environment. A matrix had been developed to facilitate a standard in the determination process for the type of protection appropriate to the occupation.

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<sup>8</sup> ONTRACK was the re-branded identity of NZRC and had been the rail corridor access provider and controller since 1 September 2004.

1.6.2 The relevant track occupation procedures included:

- ITD. This allowed for individuals performing routine inspections or investigations, making minor corrections and operating vehicles off track to protect themselves using visual and hearing detection for approaching trains
- Foul time. To be used in circumstances where ITD would not be used due to sight distances or other factors that prohibited safe use. Train control provided either blocking or verification that the designated termination time included a safety buffer of 15 minutes before the anticipated arrival time of the next rail service vehicle (RSV).

**NZRC’s Foul Time Rule 918**

1.6.3 Foul time Rule 918 stated in part:

**Granting Foul Time**

Train Control will ensure Foul Time will not conflict with rail service vehicle movements (trains, Hi-rail vehicles etc).

The location of conflicting rail service vehicle movements must be verified by Train Control prior to Foul Time being granted.

**Margin less than 30 minutes**

Where the margin between the conflicting rail service vehicle and the termination of Foul Time is less than 30 minutes:

Before granting foul time Train Control must follow the procedures in the following table:

<b>Conflicting RSV is a train</b>	<b>Conflicting RSV is other than a train</b>
<p><b>Signals available [CTC+DLAS]</b></p> <p>Arrange blocking to be applied to prevent the train from entering the Foul Time area</p> <hr/> <p><b>Signals not available [TWC+SLAS]</b></p> <p>Verify the location of the conflicting train. The designated termination time MUST include a safety buffer of 15 minutes before the anticipated arrival of the train</p>	<p>Verify the location of the conflicting RSV. The designated termination time MUST include a safety buffer of 15 minutes before the anticipated arrival of the RSV</p>

The individual obtaining Foul Time must:

- Complete a Mis 70a with the instructions issued by the Train Controller including: -
  - blocking applied or margin between termination of Foul Time and the anticipated arrival time of the conflicting RSV.

Train Control must then:

- Verify or correct the instructions.

<p><b>NOTE: 1</b> It is the responsibility of both Train Control and the Person in Charge to ensure that confirmation of blocking is included in the cross check.</p>
<p><b>NOTE: 2</b> The termination time will become the designated time to be clear of the line.</p>

### **Clearance when blocking applied for Foul Time**

When the blocking applied box has been ticked, the Mis 70a holder must advise Train Control or local attended Signal Box when they are clear of the line to enable blocking to be released.

### **Safeguarding Positions when Circumstances alter**

If, after granting Foul Time, circumstances alter which would allow a train to conflict with the designated time, Train Control must arrange to hold back the train until the Individual has been contacted and confirmed that they are clear of the track, or the designated time and the 15 minute buffer margin has elapsed.

- 1.6.4 Under Rule 918, before granting foul time, a train controller is instructed that the designated time **MUST INCLUDE** a safety buffer of 15 minutes. However, when circumstances change, train controllers may allow a train into an area after the designated time **AND** the 15-minute buffer have elapsed.

## **1.7 Features and functions of train control**

### **Inquiries from maintenance workers, Hi-rail vehicles and trolley users**

- 1.7.1 NZRC's Rail Operating Code Section 6, Instruction 15.0; **Inquiries from Maintenance Workers, Hi-rail vehicles 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 inquiries 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.

#### **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 as prescribed in the Code.

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

The termination/clearance time MUST include a minimum safety buffer of 15-minutes before the anticipated arrival time of the next train when using:

- Foul Time - signals not available to apply blocking or conflicting RSV is other than a train.

The Train Controller must verify the location of any conflicting RSV movement prior to the occupation being authorised.

#### Procedure

- When conflicting RSV is a train:
  - Dark territory<sup>9</sup> – except where the location of the conflicting train has been verified verbally within the previous 15 minutes a call must be made to the Locomotive Engineer concerned in order to obtain the current location of the train.

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).

Trains MUST NOT be dispatched into an area inside the 15-minute buffer unless “clearance” has been received from the Track User.
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- 1.7.2 Foul time occupation in TWC areas was the only situation in which trains could be dispatched through a worksite without confirmation that the track user was clear.

## 1.8 Previous track occupation incidents investigated by the Commission

### **Rail 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**

- 1.8.1 On 29 August 2002, an incident occurred at Maimai when a train controller authorised a locomotive engineer 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 worksite.
- 1.8.2 On 21 November 2002, a train controller cleared a signal at Ashburton that authorised a train to enter a section of track that was already occupied by a Hi-rail vehicle. A possible collision was averted only because 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.
- 1.8.3 On 4 December 2002, an incident occurred near Lepperton when a train controller issued a track warrant to a locomotive engineer and gave a signal to proceed into a section already occupied by a track gang replacing a broken rail. A collision was only averted because the track gang had cleared the track minutes before the train arrived.
- 1.8.4 The following safety issues were identified in these incidents:
- the train controllers not following correct procedures for handling track user enquiries
  - the lack of forward planning on the train control diagrams
  - the train controller’s lack of attention in ensuring the train control diagram was accurate and complete

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<sup>9</sup> Dark territory is used to describe operating areas such as TWC, which are not equipped with track circuitry to display the progress of trains on a VDU in train control.

**Rail occurrence report 03-103, Hi-rail vehicle and express freight train 142, track occupancy irregularity, Amokura, 10 February 2003**

- 1.8.4 On 10 February 2003, a train controller authorised northbound express freight Train 142 to depart Te Kauwhata and enter a single line section of track, into which an opposing Hi-rail vehicle movement had been authorised about 30 minutes earlier, thereby creating the potential for a head-on collision.

Among the safety issues identified was the train controller not placing the appropriate importance on the train control diagram when planning, plotting and authorising train and Hi-rail vehicle movements.

**Rail occurrence report 04-111, Train 736 signalled to enter the Christchurch-Belfast section already occupied by an authorised track occupation, 14 April 2004**

- 1.8.5 On 14 April 2004, a train controller authorised northbound express freight Train 736 to enter the Christchurch-Belfast section that was already occupied with an authorised track occupation. Mandatory control blocking procedures had been applied to protect the occupation. However, this protection had been inadvertently removed to facilitate the signalling of a previous train movement from the section and had not been reinstated.

- 1.8.6 Among the safety issues identified was the train controller not plotting the intended path of Train 736 before authorising the train to enter the occupied section. The track maintenance gang had almost completed their work when the train arrived and quick action by the locomotive engineer and the track gang averted a more serious incident occurring.

- 1.8.7 As a result of this incident, on 22 April 2005 the Commission recommended to the Chief Executive of ONTRACK that he:

incorporate an instruction in the Rail Operating Code confirming that the train control diagram is the primary tool for authorising the movement of rail service vehicles and track occupations. (005/05)

- 1.8.8 On 5 May 2005 the Chief Executive of ONTRACK responded in part:

ONTRACK accepts the recommendation (005/05)

## 2 Analysis

- 2.1 The near collision occurred because the trainee train controller issued a track warrant allowing Train 725 into a section that was already occupied by a track maintenance gang working under foul time authority. Why the trainee train controller issued the track warrant when the plot line clearly intersected the occupation authority line was not clear.
- 2.2 The trainee train controller was almost at the end of a busy, uninterrupted 7-hour shift, during which he was being assessed for certification to his first desk. During the assessment, the trainee train controller was being evaluated on his handling of key tasks, including the issuing of track occupation authorities and track warrants. To encompass all aspects of the documented certification process, the network control manager presented many theorised event scenarios during lulls in the trainee's desk tasks. These scenarios covered all possible incidents the trainee train controller would have to confront at some stage in his future role as a certified train controller.
- 2.3 By introducing theoretical scenarios to an already busy desk, the process the network control manager was following unintentionally overloaded the trainee train controller. The trainee train controller was probably uncertain whether he could punctuate the assessment and therefore did not request an opportunity for nourishment and a personal needs break. This probably increased the pressure on the trainee train controller during the day and he was probably fatigued when he authorised the track occupation and issued the conflicting track warrant to Train 725. On the other hand, the network control manager could have offered the trainee train controller the opportunity for a break during the shift, but this was overlooked.
- 2.4 In accordance with current documented processes, the network control manager was technically in charge of the desk, with the trainee train controller issuing authorities in the network control manager's name. However, the certification process had been deemed by ONTRACK on this occasion to be an opportunity for the trainee train controller, having proven his competence in the completed OJT and theory phases, to demonstrate his skills and judgement to operate a train control desk. The network control manager had remained with the trainee train controller for the majority of the shift and his reasons for vacating the train control office for a short time were understandable and probably reflected his own level of confidence in the trainee.
- 2.5 The trainee train controller had completed his OJT and had been recommended by his trainers for assessment. He achieved high marks in the theory examinations. During the assessment he received favourable comment from the network control manager and leaving him to complete the shift would have been an indication of the network control manager's confidence. The trainee train controller had received considerable indication that he had probably done well enough to achieve certification but had not had a confirmation. The mixed emotion of elation at probable success but with a lingering doubt probably reduced the trainee train controller's attention and focus when he plotted the track warrant through the occupation and issued the conflicting authority.
- 2.6 In view of the actions being taken by ONTRACK to reappraise its train control certification process, no safety recommendation has been made. The reappraisal included steps to ensure that theorised event scenarios, if not observed during the desk certification, are discussed and marked at a post-desk certification meeting.
- 2.7 When the trainee train controller received the request from the track ganger for foul time, he told the track ganger that Train 725 had left Oaro at 1240. From that information, and the fact that he was granted authority until 1355, the track ganger assumed that he had an uninterrupted occupation and saw no need to query the trainee train controller regarding a possible alternative occupation window.

- 2.8 However, the departure time of 1240 of Train 725 from Oaro was an event that had occurred 55 minutes previously. The trainee train controller should have obtained an up-to-date location of the train, and had he done so, he would have realised that Train 725 was probably only about 15 minutes from Tormore and he could have suggested an alternative occupation window to the track ganger.
- 2.9 Even if the location of Train 725 had been established, the track occupation could have been authorised, as the locomotive engineer of Train 725 had not been issued with a track warrant to travel beyond Tormore. The trainee train controller could have elected to hold the train there until the track ganger had called clear of the track.
- 2.10 It was fortunate that Train 725 was routed via the loop at Tormore to cross Train 734 as this movement cost about 5 minutes. Had Train 725 travelled via the main line, it would have arrived at the worksite correspondingly earlier and the consequences could have been more serious.
- 2.11 Unlike double line automatic signalling (DLAS) and CTC signalling system areas where the application of control blocks was available to protect foul time occupations, in TWC and single line automatic signalling areas, control block application was not so readily available to protect foul time occupations. Train movements in TWC areas were authorised by track warrant and although persons in charge of Hi-rail vehicles, trolleys and mobile track maintenance vehicles occupying the main line and major worksites were also authorised to occupy the main line by track warrants, foul time occupations were not similarly protected. Foul time occupations relied in most circumstances on the train controller ensuring there was time separation between the conflicting occupations.
- 2.12 Designated time on track and the designated termination time were supposed to be subject to a 15-minute safety buffer. However, Rule 918 had conflicting information on whether the buffer time was included within the designated time, or an extension of the designated time on track. Regardless of the conflicting information, the recorded track occupation and the plotted track warrant for Train 725 intersected and the second authority should not have been issued.
- 2.13 The track ganger expected that his time allowed on track terminated at 1355 and that he would call clear at that time, at which time an RSV could be allowed to enter the vacated section. The track ganger later said that it was his understanding that a foul time occupation in TWC territory was terminated with a call clear in the same manner as for CTC and DLAS territories because the train controller needed to remove the control blocks. However, the track ganger was not aware that, in the event of a change of circumstances, a train controller could dispatch a conflicting RSV through the worksite 15 minutes after its designated termination time had elapsed without conferring with the track user. A safety recommendation has been made to the Chief Executive of ONTRACK addressing these issues.
- 2.14 The trainee train controller's rail industry background gave him an advantage in that he knew and understood the safe workings of a railway system from a train signalling aspect. There were similarities in the fundamental principles of safe train operating practices throughout the world and he was able to transfer his industry experience to the New Zealand environment.
- 2.15 The initial stages of his induction and training to train control had been successful, indicated by his relatively high pass marks in the final theory examinations completed the day before the incident. However, NZRC's acceptance of rostering 6 different tutors to undertake OJT at the desk did not provide the trainee train controller with an ideal environment to apply his theory training practically and was therefore undesirable. Better training continuity and stability for the trainee train controller would have been provided if no more than 2 experienced train controllers had been selected to tutor him throughout the OJT period. A safety recommendation has been made to the Chief Executive of ONTRACK addressing this issue.

- 2.16 The network control manager had commented favourably on the trainee train controller's plotting performance throughout the day of the assessment. This incident again highlights the fact that the train control diagram is the primary tool for authorising the movement of rail service vehicles and track occupations. As a result of rail occurrence report 04-111, the Commission recommended to the Chief Executive of ONTRACK that the importance of the train control diagram be stressed in its Rail Operating Code. The recommendation is equally applicable to this incident, but no new safety recommendation has been made.
- 2.17 Although the locomotive engineer of Train 725 did not report, and was probably unaware of the incident, and although the network control manager was not required to relieve him, it would have been prudent for the network control manager to have at least checked on his wellbeing and ascertain what he saw when he passed through the worksite.

### **3 Findings**

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

- 3.1 The trainee train controller did not identify the conflict when he plotted the limits of the track warrant for Train 725 through the recorded track occupation.
- 3.2 The issuing of conflicting track warrant No. 80 to Train 725 resulted in the near collision at the 99.5 km.
- 3.3 The trainee train controller did not establish the current location of Train 725 to make this information known to the track maintenance gang.
- 3.4 The trainee train controller had received adequate and appropriate theory training prior to commencing his OJT.
- 3.5 The rostering of 6 different OJT tutors to coach and provide practical training for the trainee train controller was undesirable.
- 3.6 The high shift workload, certification process and lack of attention to his personal wellbeing probably left the trainee train controller fatigued at the end of the shift.
- 3.7 The trainee train controller's doubt that his assessment was going to lead to a successful certification probably affected the trainee train controller's focus towards the end of the shift.
- 3.8 NZRC/ONTRACK had not updated their procedures to reflect their changed business practice that a trainee train controller, having successfully passed the competency stages, was virtually in charge of the desk when being assessed for certification.
- 3.9 The presence of the network control manager at the desk may have been a safety defence against the incident occurring.
- 3.10 The track maintenance gang correctly followed track occupation procedures and obtained appropriate foul time occupation when they were unable to comply with the ITD track occupation criteria.
- 3.11 The actions of the locomotive engineer of Train 725 did not contribute to the incident.
- 3.12 There was conflicting information in foul time procedures regarding the positioning of the 15-minute safety buffer before or after the designated time to be clear of the track.

## 4 Safety Actions

4.1 On 5 August 2005 ONTRACK issued an amendment to the Rail Operating Code as follows:

### **On The Job Training**

Candidates will, on successful completion of Train Control School advance to "OJT" phase.

The Trainee Train Controller is then assigned for On-Job Training. The trainee will be tutored by a qualified Train Controller qualified in the area being learnt. Tutors will generally have at least 2 years Train Control experience and a trainee will generally be limited to tuition from 2 primary tutors.

Tutor Train Controllers are responsible for supervising trainees so that correct processes are taught and applied. Progress is assessed and tasks signed off by the tutor as competence is achieved. Trainee Train Controllers are responsible for applying procedures taught to them and acting only within any limitations set by the tutor.

Task competency is detailed in the OJT Training Manual held by each trainee. The OJT training phase will generally last between 6 and 10 weeks.

### **Certification**

On receipt of a completed Certificate of Competency, signed by the trainee and tutor, the trainee will then undergo an independent assessment to gain a full licence to operate which will consist of:

**Written Examination** – Achieving an 80% pass mark in each multi choice signalling category examination and in written local instruction examination for the area of control. These will be closed book examinations.

**Practical Assessment** – The trainee will control the area for which they hold a certificate of competency under the assessment of a Train Control qualified Manager or Level 4 Train Controller who has not conducted the OJT. This will independently assess the trainee's handling of track calls, technical competence with systems and compliance with operating codes, procedures and rules. The safety observation sheet is used and associated key tasks are assessed. Any tasks not observed while operating will be assessed verbally off-desk to confirm understanding. The certificate of competency will be authority for the trainee to control the area during assessment.

**Map reading** – Trainees will be tutored in this skill and must be able to accurately read and give grid references.

### **Learning a New Area**

On receipt of a completed Certificate of Competency, signed by the trainee and tutor, the trainee will then undergo an independent assessment to an area certification.

The certification process will require the Train Controller to achieve an 80% pass mark in any multi choice signalling category examination for signalling categories not already held and in written local instruction examination for the area of control. These will be closed book examinations. A safety observation assessment must be completed by a Train Control qualified Manager or Level 4 Train Controller who has not conducted the OJT.

## **5 Safety Recommendations**

- 5.1 On 24 June 2005 the Commission recommended to the Chief Executive of ONTRACK that he:
- 5.2 correct inconsistencies identified in the Foul Time Rule 918 and Rail Operating Code relating to safety buffer, clearance of occupations and safeguarding positions when circumstances alter. (025/05)
- 5.3 restrict the number of tutor train controllers undertaking training of uncertified or retraining new train controllers to no more than 2 during the OJT period. (026/05)
- 5.4 On 15 July 2005, the Chief Executive of ONTRACK replied in part:

025/05: ONTRACK accepts this recommendation. This should be implemented by end of December 2005.

026/05: ONTRACK accepts this recommendation. We will advise when this has been implemented.

Approved on 21 July 2005 for publication

Hon W P Jeffries  
**Chief Commissioner**



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