



Report 98-109

Train 482

near collision

Tokoroa

2 June 1998

Abstract

On Tuesday, 2 June 1998, Train 482 was running from Putaruru to Kinleith with a rake of six empty wagons. At approximately 0510 hours the train was stopped by a member of the public waving a torch just ahead of a main line blockage caused by wagons in the Tokoroa timber siding which had run away and derailed fouling the main line. The safety issues identified were the adequacy of the standards and procedures in place to protect the main line from possible wagon runaways on steeply graded sidings, and the adequacy of procedures to identify recurring problems and initiate appropriate follow up action. Four safety recommendations were made to Tranz Rail Limited to address these issues.

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Glossary of abbreviaions

LE	locomotive engineer
LTSA	Land Transport Safety Authority
Tranz Rail	Tranz Rail Limited

Transport Accident Investigation Commission

Rail Incident Report 98-109

Train type and number:	Express Freight 482
Date and time:	2 June 1998, 0510 hours
Location:	Tokoroa at 60 km Kinleith Branch
Type of occurrence:	near collision
Persons on board:	crew: 1
Injuries:	Nil
Damage:	Nil
Investigator-in-Charge:	R E Howe

1. Factual Information

1.1 Narrative

- 1.1.1 On Tuesday 2 June 1998 Train 482, a rostered Tranz Rail Limited (Tranz Rail) express freight, was running between Putaruru and Kinleith.
- 1.1.2 The train consist was locomotive DFT7226 and six empty bogie wagons with an all-up weight of 190t.
- 1.1.3 At approximately 0510 hours the train was approaching the Tokoroa timber siding at approximately 60 km/h when the locomotive engineer (LE) saw a torch being waved ahead of the train.
- 1.1.4 The LE thought this might be a signal regarding shunting at the siding and checked his list as he made a brake application. His brakes “were biting” and the train was under control when he saw the main line ahead was obstructed by a wagon. He was able to stop his train well short of the obstruction.
- 1.1.5 The LE stated his headlights were on full and that misty rain restricted visibility. Although he was able to pick up the torch signal and respond to it he stated he may not have been able to stop clear of the obstruction without the prior warning.
- 1.1.6 The torch was being held by a truck driver who had been operating from the Carter Holt Harvey Tokoroa saw mill. The truck driver had been making a series of trips from the saw mill to Kinleith Mill. He had noticed wagons stored at the south end of the Tokoroa timber siding (see Figure 1) at approximately 0130 hours that morning. At approximately 0330 hours when he returned to the saw mill he noticed when driving down the internal mill road parallel to the siding (see Figure 2) that the wagons had moved to the north end of the siding and, despite the poor visibility, he noted one was derailed at the end of the siding. The wagon had derailed into some timber stacks that were behind the stop block (see Figure 3).
- 1.1.7 Although not unduly concerned at the time, the truck driver stated that the possibility of other wagons being derailed was playing on his mind during his next trip to Kinleith and on his return at 0445 hours he stopped his truck and used a torch to investigate the end of the siding in detail.
- 1.1.8 During this investigation he found the wagons had moved the stop block at the end of the siding, partially demolished the timber stacks, and the leading wagon had come to a halt foul of the adjacent main line.
- 1.1.9 The truck driver had worked on the railway in the past and was familiar with practical operating aspects. He immediately looked for a Train Control phone in the vicinity but was unable to locate one in the Tranz Rail line-side buildings close by. He then drove to the nearest phone he knew of, the mill boiler room some 200 m away, and advised staff at approximately 0450 hours there was “a wagon out on the main line” and to get hold of Train Control to stop the train that he knew was due about 0500 hours. He then returned to the scene with his torch in case the notification to Train Control was too late to stop the train.

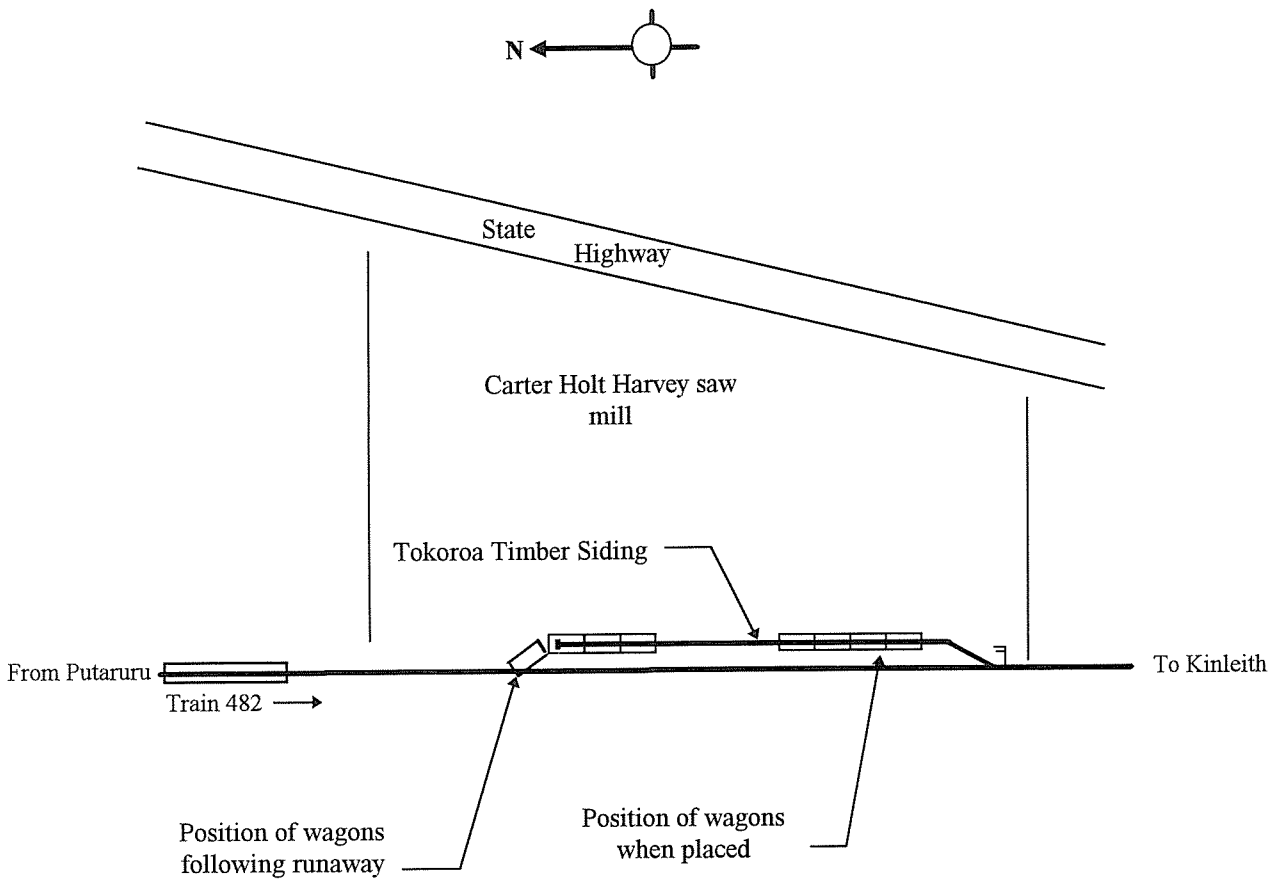


Figure 1
Locality plan (NTS)

- 1.1.10 The boilerman immediately contacted the mill supervisor. The supervisor had no details of the Tranz Rail 0800 emergency reporting number, or the number for Train Control. He rang the Kinleith mill and the mill gate before finally being given the contact number for the Tranz Rail roving shunter based at Kinleith. His recollection was that he advised the roving shunter that there was “a wagon derailed at the top end” and that it was “foul of the main”.
- 1.1.11 The roving shunter was advised by phone at approximately 0500 hours. His recollection of the advice was “I am from Pinex at Hutt Timber (Tokoroa timber siding). A wagon took off”. The roving shunter asked if it was derailed and was again told “no, it took off”. The roving shunter did not give the message urgency, believing the wagon had run down the siding and hit the stop block at the end of the siding. However he did travel immediately to the site, arriving after Train 482 had been stopped.
- 1.1.12 Shortly after the truck driver returned to the site with his torch, after advising the boilerman, he was joined by three Carter Holt Harvey staff from the saw mill. At approximately 0509 hours the truck driver saw the headlight of Train 482 approaching. He asked all those in the vicinity to stand clear and immediately went towards the train waving his torch. He estimated he covered 100-150 m as he walked quickly towards the train before the LE of the train “dipped his lights a couple of times” and he knew that he had been seen.

1.2 The runaway wagons

- 1.2.1 Five empty Zg bogie wagons had been placed at the south end of the Tokoroa timber siding over the weekend 30-31 May. As required by Tranz Rail rules and code, air brakes and hand brakes had been applied to secure the wagons. The last wagon at the south end had also been chained to the track. The chain was connected by linking and no locking device was used. Figure 4 shows a typical example of the chaining system used, including the addition of a lock introduced after the incident.
- 1.2.2 At approximately 1630 hours on Monday 1 June 1998 a further three empty Zg wagons were placed in the south end of the siding. This placement was carried out under the control of the Kinleith roving shunter and necessitated unchaining the rake of five wagons placed earlier, coupling up and releasing the brakes, and pushing the rake of eight wagons to the north to clear the south end clearance point.
- 1.2.3 The roving shunter stated that on completion of the placement the air brakes on the eight wagons were applied, at least two hand brakes were applied at the south end, and the last wagon was again chained to the track in the location used to secure the rake of five wagons.
- 1.2.4 The LE of the shunt assisting the roving shunter in this work recalled seeing the chain in position when he returned through Tokoroa from Kinleith on Train C81 at approximately 1730 hours on 1 June 1998.
- 1.2.5 At approximately 0200 hours on Tuesday 2 June 1998 a mill staff member saw wagons moving at slow speed adjacent to the mill. He was not sure what line they were on and thought nothing of the occurrence until interviewed following the incident.
- 1.2.6 Another mill staff member heard a loud impact noise at approximately the same time. The mill is not a quiet environment and again he thought nothing of the occurrence at the time.
- 1.2.7 The eight wagons which ran away came to rest still coupled, with the two leading wagons derailed and with the leading wagon foul of the main line and 27 m beyond the concrete stop block at the end of the siding.

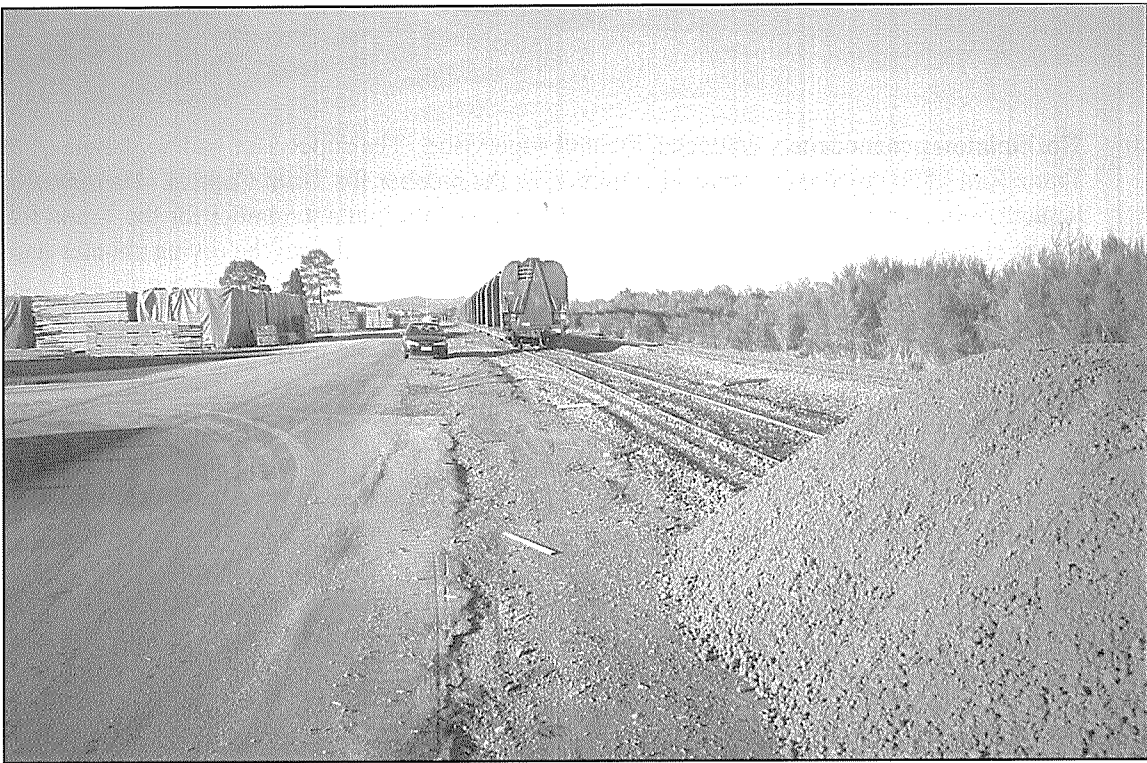


Figure 2
Looking south from the end of the siding, internal mill road on the left

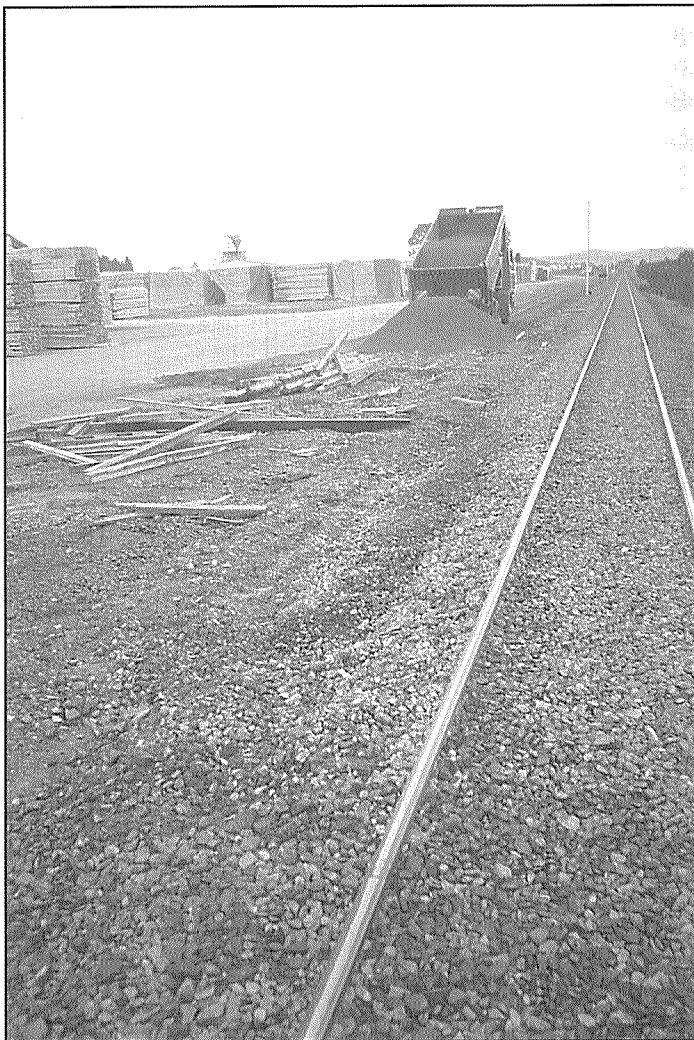


Figure 3
Looking south from the position of
the derailed wagon fouling the main line

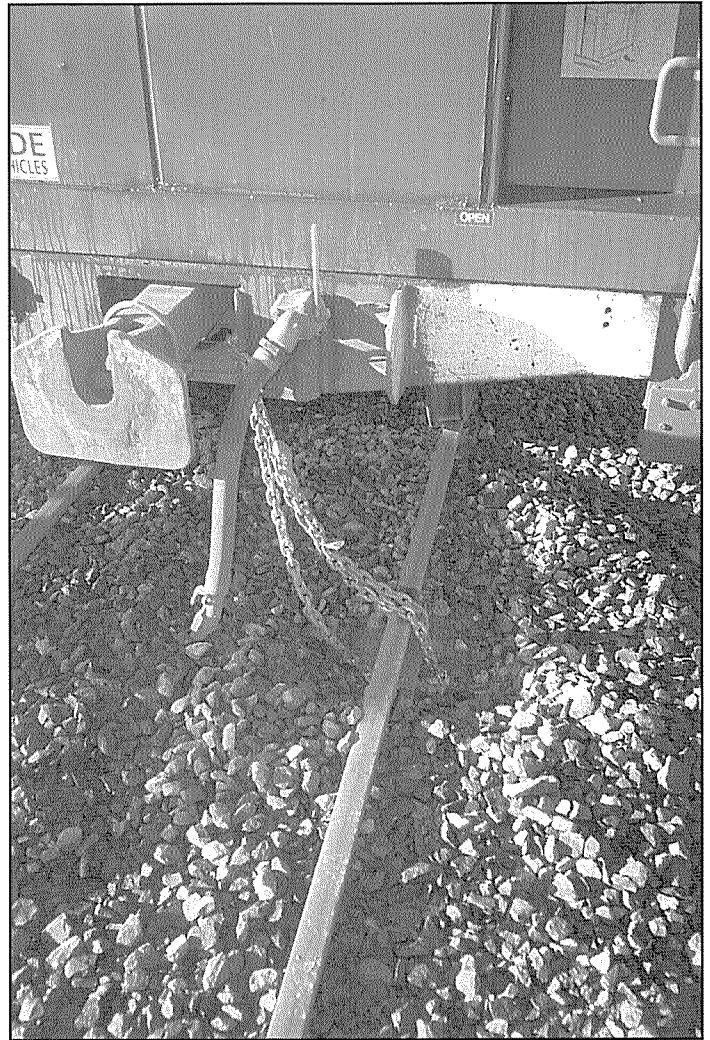


Figure 4
Typical chaining detail

- 1.2.8 Following the incident the chain used to secure the last wagon was found on the ground between the siding rails at 60.387 km adjacent to the hole dug under the rails by the roving shunter to place the chain. The chain was coupled, with the coupled lengths shorter than that required to reach and secure a wagon.
- 1.2.9 The first Tranz Rail staff on site who inspected the eight wagons following the incident found no air brakes or hand brakes applied.
- 1.2.10 The distance from the chaining point to the stop block at the end of the siding was 260 m. The eight wagon rake which ran away was 132 m in length.

1.3 Tokoroa timber siding

- 1.3.1 The Tokoroa timber siding was a single-ended siding installed in 1996 to serve the Carter Holt Harvey saw mill. A previous longer double-ended siding which had served the Hutt Timber Company on the same site for many years was removed in 1994.
- 1.3.2 A feature of the double-ended siding was the protection provided at the down hill (northern) end of the siding as part of the turnout installation.
- 1.3.3 The single-ended siding installed in 1996 terminated in a stop block at the northern end. The grade of the main line in this location (1 in 70 downgrade to the north) and the relationship to the mill development meant the siding was also installed on a 1 in 70 grade in 1996.

1.4 Previous runaway history

- 1.4.1 Tranz Rail advised that there had been three reported runaways resulting in derailments on the Tokoroa timber siding since installation in 1996:
- On 5 November 1996 involving a loaded UK wagon, with air brakes and hand brakes reportedly applied; no cause was found.
 - On 27 November 1996 involving a loaded UK wagon, with air brakes and hand brakes reportedly applied; no cause was found.

Following these two derailments chainage of the last (uphill) wagon of any rake left in the siding was introduced. This was a local solution to meet a perceived problem and no standards or procedures were issued covering such chaining.

- On 3 March 1998 involving a wagon under load; no brakes or chains were applied at the time.

A feature of the first two incidents was the failure to determine the cause, and the limited follow up on the potential weaknesses identified.

1.5 Standards for sidings

1.5.1 Tranz Rail advised the following instructions related to the security of wagons on the Tokoroa Timber siding.

1.5.1.1 Rule 121 (b) required:

121. (b) Vehicles in Siding on Grade - In a siding on a gradient vehicles must be placed close to the stop block or trap points at the lower end of the siding; in automatic signalling areas the vehicles must be clear of the fouling track circuits.

1.5.1.2 Rail Operating Code, Section 5, clause 1 required:

... Always ensure effective braking is applied to vehicles that have been placed.

And clause 3.7 required:

3.7 Vehicles Clear of Fouling Points
Vehicles left standing in sidings must be clear of fouling points of any adjoining sidings or lines and be secured to avoid risk of drifting and collision.

1.5.1.3 Rule 156 (a) and (b) required:

156. (a) Securing Train Before Locomotive Detached - As air brakes are liable to release owing to leakage of air they must not be relied upon to secure a train or any portion of a train when the train locomotive is detached. Sufficient hand brakes must first be applied to hold the train stationary.

(b) Before a train locomotive, either with or without vehicles attached, is detached from a train the Locomotive Engineer must apply the air brakes on the train by making a reduction of at least 75 kPa in brake-pipe pressure. The member detaching the locomotive must ensure that the air brakes are applied on the train before closing the air brake coupling cocks at the point of detachment.

1.5.1.4 A draft joint operating plan dated April 1998 was under discussion between the parties at the time of the incident (a copy of the draft plan is attached as Appendix 1).

1.5.2 Tranz Rail was asked to supply the standards for siding installation, particularly as related to grade and protection, which were in effect when the siding was installed in 1996. Tranz Rail advised that there have been no formal engineering instructions identified for the installation of a siding on a grade. However, in the past where a new siding has been constructed, the grade of a siding had been taken into consideration in the design, construction and safe operations.

1.5.3 Tranz Rail confirmed that there were no operating procedures or rules which refer to the chain system that was being used in this siding, other than the instruction covered in the draft joint operating plan.

1.6 Event recorder

1.6.1 The event recorder for Train 482 was extracted and the long log giving speed at 10 second intervals was supplied for analysis.

1.7 Notification

1.7.1 The Commission became aware of a possible incident through unofficial advice received at 1600 hours on 2 June 1998. The incident was not notified to the Land Transport Safety Authority (LTSA) as required by the Transport Services Licensing Act, until midday on Wednesday 3 June 1998 after the LTSA made enquiries based on the original unofficial advice.

1.7.2 Late notification of incidents has been an ongoing concern identified in the following Transport Accident Investigation Commission rail occurrence reports:

- **Report 96-116**

It was recommended that Tranz Rail review the procedures for incident reporting to ensure that incidents such as the loss of a gangway were immediately reported to allow the necessary timely notification to the Land Transport Safety Authority. (055/97).

Tranz Rail responded that a review was underway to reinforce procedures that were currently in place when an occurrence is required to be notified to LTSA.

- **Report 97-104**

The following safety action was recorded:

As a result of a Commission safety recommendation arising from Railway Occurrence Report 96-116 Tranz Rail advised on 21 August 1997 that a review was underway to reinforce procedures then in place when an incident was required to be notified to the LTSA. Tranz Rail has confirmed that this review will include revised procedures to avoid the delay associated with the notification of this incident.

- **Report 98-103**

The analysis included that the LTSA was re-negotiating a memorandum of understanding with Tranz Rail, and that this would address current problems with incident notification. In view of this no specific recommendations were made regarding this aspect of the investigation.

- **Report 98-112**

The report commented on a 36 hour delay in incident notification which adversely affected the investigation.

1.7.3 The LTSA advised that it has now reached an understanding with Tranz Rail on improved notification procedures which should rectify late notification of incidents, and that the new procedures will be formalised and introduced as soon as possible although it could not predict a date of implementation.

2. Analysis

2.1 The runaway

2.1.1 The chaining of the last wagon of the rake was confirmed and there is no reason to doubt that the wagons were secured on 1 June 1998. No explanation could be found as to why air brakes and hand brakes were released, and the chain removed, before the wagons ran away. It is notable that two of three previous runaways were unexplained and deliberate intent cannot be discounted.

2.2 The near collision

2.2.1 The seriousness of this incident was not so much because the wagons ran away but because the main line was vulnerable to blockage from any such runaway. The possible consequences, had the fortuitous sighting and prompt practical action initiated by the truck driver not occurred, could have been serious. There was potential for derailment of the locomotive of Train 482 if collision had occurred, with the added risk of flying debris hitting mill staff who had gathered at the derailed wagons.

2.2.2 Analysis of the event recorder output and the recollections of the truck driver who stopped the train showed the truck driver first saw the train when it was 1.5 km from the obstruction and travelling at approximately 60 km/h. The LE first saw the torch some 500 m prior to the obstruction. The train stopped in approximately 350 m.

2.2.3 If the Carter Holt Harvey staff had been able to contact Tranz Rail immediately at 0450 hours with accurate information there would have been sufficient time for Train Control to have stopped the train. Even at 0500 hours there was still sufficient time for the roving shunter to have contacted Train Control if he had clearly appreciated the problem. The differing recollections of the mill supervisor and the roving shunter regarding their telephone conversation show there is some doubt as to how the problem was presented and received. It was fortuitous that the practical railway knowledge of the truck driver permitted an alternative solution.

2.3 Previous history

2.3.1 Three runaways, two of which were unexplained, in less than two years on a siding with the layout and grade of the Tokoroa timber siding should have alerted Tranz Rail to a potential problem and initiated some action to manage the risks involved. In the event it was left to local staff to introduce a non-standard chaining detail which, while an improvement, did not fully address the problem.

2.3.2 Although the draft joint operating plan now recognises chaining there are no standards or instructions to support such a practice.

2.4 Siding standards

2.4.1 A number of factors contributed to the potential for main line blockage including:

- The grade of the siding meant that any unsecured wagons were likely to run away.
- The inability of the stop block at that lower end of the siding to contain runaway wagons.
- The close proximity of the main line.

2.4.2 In addition any runaway wagons derailed at the stop block created a potential hazard for road traffic on the heavily used mill road adjacent to the siding on the east side (see Figure 2).

2.4.3 The lack of any Tranz Rail standards which recognised and took account of such factors when installing sidings directly off the main line resulted in an installation where four runaways have occurred in approximately two years in circumstances where there was inadequate protection for the main line.

2.4.4 Rule 121 (b) was not generally observed. The siding had standing room for 16 bogie wagons and it was common practice for shorter rakes of wagons to be placed at the southern (uphill) end of the siding to suit Carter Holt Harvey operations.

2.5 Notification procedures

- 2.5.1 The problem of late notification (paragraph 1.7) has been referred to in four of the 24 rail occurrence reports published by the Commission since late 1996. This is a high percentage considering the importance of the incidents investigated.
- 2.5.2 If incidents go unreported, or late reporting of incidents inhibits effective investigation, the opportunity to improve rail safety and prevent future incidents, or accidents, from similar causes may be lost. Prompt notification maximises the opportunity for safety lessons to be learnt from every investigation.

3. Findings

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

- 3.1 The eight wagons placed in the Tokoroa timber siding on 1 June 1998 were probably effectively secured at the time of placement.
- 3.2 The wagons were not placed in compliance with Rule 121(b)
- 3.3 The air brakes and hand brakes were probably released, and the chain removed, some time between 0450 hours on 1 June and 0200 hours on 2 June by persons unknown.
- 3.4 Runaways were a known problem on this siding due to the steep grade.
- 3.5 No cause was found for two earlier runaways, indicating interference with secured wagons may have been a factor.
- 3.6 Although some measures had been taken (chaining) following the first two runaways, this did not provide a defence to deliberate tampering with secured wagons.
- 3.7 The details of the siding layout and the operating practices it was worked under did not supply adequate protection for the main line for possible runaways.
- 3.8 The delay in contacting Tranz Rail to report the incident, and the accuracy of the information relayed, did not result in Train Control being informed in time to contact the LE of Train 482 and stop the train.
- 3.9 A possible collision was instead averted by the prompt and effective action of a passing truck driver.
- 3.10 Delays in notifying incidents to the Commission may inhibit the effective investigation necessary to avoid similar occurrences in the future.

4. Safety Actions

- 4.1 Tranz Rail advised that immediately following the incident, direct action had been taken through a temporary solution involving placing wagons directly up against a stop block until a permanent fix was agreed with all parties.
- 4.2 Tranz Rail has taken steps to supply siding holders with the necessary information to immediately contact Network Control should any irregularities occur.

5. Safety Recommendations

- 5.1 On 27 July 1998 it was recommended to the Managing Director of Tranz Rail that he:
- 5.1.1 Take immediate steps to review the security of wagons placed on the Tokoroa timber siding and initiate action to reduce the possibility of runaways (053/98) and;
 - 5.1.2 Take immediate steps to review the security of the main line adjacent to the Tokoroa timber siding and initiate action to protect the main line from any runaways which may occur (057/98) and;
 - 5.1.3 Review the adequacy of existing incident reporting procedures to identify recurring problems and initiate appropriate follow up action (054/98) and;
 - 5.1.4 Review the adequacy of standards and procedures relating to the operation of existing sidings on steep grades, and the installation of new sidings on steep grades, to ensure safe operation and adequate main line protection have been, or will be, achieved as appropriate (055/98).
- 5.2 On 14 September 1998 the Managing Director, Tranz Rail responded as follows:
- 5.2.1 **053/98 & 057/98**
Tranz Rail has reviewed the overall security of wagons placed on this siding and completed both safety recommendations to reduce the possibility of runaways.
 - 5.2.2 **054/97**
The internal reporting of incidents of this nature are being reviewed.
 - 5.2.3 **055/97**
Tranz Rail is reviewing the adequacy of standards and procedures relating to existing sidings on steep grades.

Approved for publication 31 March 1999

Hon W P Jeffries
Chief Commissioner

TRANZ RAIL LTD

CARTER HOLT HARVEY TIMBER

KINLEITH

JOINT OPERATING PLAN: TOKOROA MILL

1.0 WORK AREA

This comprises the CHH Timber Private Siding at Tokoroa and the roadway adjacent to, and on the east side, of the siding.

2.0 ALLOCATION OF RESPONSIBILITIES

2.1 Tranz Rail personnel shall...

2.1.1 Place wagons to, and pull wagons from, the siding using Tranz Rail shunting services.

2.1.2 Secure wagons placed on the siding by application of sufficient hand brakes and by attachment to the rail using a securing chain.

2.1.3 Clear empty wagons of debris prior to loading.

2.1.4 Secure by strop and/or chain all timber loaded into wagons, prior to departure.

2.1.5 When required, cover loads with a tarpaulin prior to departure.

2.2 CHH Timber personnel shall...

2.2.1 Load timber into wagons by means of forklift or other mechanical equipment in accordance with the requirements of the Tranz Link Freight handling code.

3.0 SAFE OPERATING PRACTICES

- 3.1 Prior to placing or pulling wagons to/from the siding the Tranz Rail Shunter shall inform any persons working in the vicinity, of the need to stand clear until shunting has been completed.
- 3.2 Shunting must not commence until all such persons have acknowledged the message and are standing clear.
- 3.3 Once shunting has commenced, loading of wagons or any other activity involving working in proximity to wagons must remain suspended until shunting has been completed.
- 3.4 CHH Timber personnel or any other persons on site (eg: contractors) are not permitted to move railway wagons.
- 3.5 All personnel in the vicinity of the siding shall wear high visibility clothing.

4.0 COMMUNICATIONS

- 4.1 If any damage or derailments occur then the Terminal Supervisor, Tranz Rail Ltd, Kinleith is to be advised.

Contact:

• [REDACTED]	Office:	[REDACTED]
	Home:	[REDACTED]
	Mobile:	[REDACTED]

- 4.2 Other Contact Details:

Tranz Rail Ltd:

• Operation Supervisor Kinleith (hours: 0530 - 2000 hours)	Office:	[REDACTED]
	Mobile:	[REDACTED]
• Roving Shunter	Mobile:	[REDACTED]

CHH Timber:

• [REDACTED] Transport Co-Ordinator (hours 0830 - 1730 hours)	Office:	[REDACTED]
	Home:	[REDACTED]
• [REDACTED], Mill Liaison	Office:	[REDACTED]

[Names and telephone numbers deleted by the Transport Accident Investigation Commission.]

5.0 HAZARDS

5.1 Siding Gradient

The CHH Timber Private siding is a single line of railway connected to the mainline at the Southern end, ~~facng~~ facing towards Kinleith. The opposite end of the line runs in a Northerly direction and terminates With a stop block.

The siding is on a descending grade towards the stop block.

Refer to Clause 2.1.2 herein for the method of securing wagons to prevent run away and to Clause 3.4 herein concerning the prohibition on persons other than Tranz Rail employees from moving wagons.

5.2 Moving Vehicles

The area immediately to the East of the siding is used by assorted road vehicles and forklifts. Care must be taken by all personnel working in this loading area.

5.3 Lighting

Work associated with loading wagons, covering and securing loads, and shunting wagons is only permitted within the safe limits of available lighting.

6.0 SITE SAFETY PLAN

This Joint Operating Plan should be included in your Site Safety Plan.

7.0 REVIEW

If the need arises CHH Timber or Tranz Rail Ltd may desire a review of this Joint Operating Plan consequent upon a change in operating arrangements or other cause.

Tranz Rail Ltd (or our external quality auditors) may audit compliance with the Joint Operating Plan as part of our safety systems.

X _____
Terminal Manager
Rail Operations
HAMILTON

X _____
Mill Manager
Carter Holt Harvey Timber
TOKOROA

