Report 98-115

Train 823

runaway wagons

Middleton

30 September 1998

Abstract

On Wednesday 30 September 1998, Train 823 was running from Lyttelton to Ngakawau with a rake of 18 empty coal wagons. At approximately 2340 hours the train stopped on the down main adjacent to the Middleton marshalling yard (5 km west of Christchurch) and the locomotives were then detached for servicing. A few minutes after the locomotives had cut off, the wagons started moving in an easterly direction down the grade towards Christchurch. In the course of their movement the wagons crossed two protected level crossings where insufficient warning time for road traffic was provided. The safety issues identified were non-compliance with the existing rules for securing detached vehicles and the practice of leaving detached wagons on the main line.

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Glossary of abbreviations

LE	locomotive engineer
MSL	Main South Line
TXO	train examiner operations
Tranz Rail	Tranz Rail Limited

Transport Accident Investigation Commission

Rail Incident Report 98-115

Train type and number:	Express Freight 823
Date and time:	30 September 1998, 2340 hours
Location:	Middleton
Type of occurrence:	Runaway wagons
Persons on board:	Nil
Injuries:	Nil
Damage:	Nil
Investigator-in-Charge:	R E Howe

1. Factual Information

1.1 Narrative

1.1.1 On Wednesday 30 September 1998, Train 823 was a scheduled coal train taking empty wagons from Lyttelton to Ngakawau. The consist was two DX class locomotives and 18 CB coal wagons.

1.1.2 At 2336 hours the train stopped on the down main line at Middleton at approximately 15.3 km Main South Line (MSL), so that the locomotives could be detached for servicing, including fuelling. Servicing normally took approximately 25 minutes.

1.1.3 Although there was sufficient room to accommodate the train in Middleton yard the local practice was to berth such trains on the main line when servicing.

1.1.4 The locomotive engineer (LE) of Train 823 stated that when bringing the train to a stop he released the air brakes on the train so that it drifted to a halt adjacent to where the acting train examiner operations (TXO) was ready to uncouple the locomotives. The LE stated that when the train came to a stop he made an auto brake application[1].

1.1.5 The acting TXO, who was close to the train as it pulled up, closed the air brake coupling cocks between the locomotive and the first wagon prior to uncoupling. Using his radio telephone he then requested the LE to "ease back"[2] so that the coupling pressure could be released. The locomotives were eased back, and after uncoupling them the acting TXO piloted the locomotives to the servicing depot.

1.1.6 The radio telephone contact that the acting TXO had with the LE to "ease back" was the only communication that took place between them during the detachment of the locomotives.

1.1.7 The acting TXO did not apply the handbrakes on any of the coal wagons. He stated that it was common practice not to apply the handbrakes on the wagons when left unattended for such a short time as "the air brakes were sufficient to hold".

1.1.8 The acting TXO stated that he did not know whether or not the train brakes were applied but had assumed that when the train had pulled up the LE had made the necessary reduction in air pressure to brake the whole train.

1.1.9 At approximately 2340 hours the signalman on duty at the Addington signal box noted from the signal panel that the track circuit where the rake of wagons had been standing was showing as unoccupied and the track circuit behind had become illuminated indicating that the rake had started to move backwards.

1.1.10 The signalman, after advising the Middleton Operations Controller of the emergency, then set the route from the down main on which the rake was travelling (in the up direction), to the up main. Once running on the up main the runaway wagons began to activate level crossing protection as intended to protect road traffic.

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[1] An auto brake application applied the air brakes throughout the train as distinct from a locomotive brake application which applied the air brakes on the locomotive only.

[2] To "ease back" meant the locomotives were moved slowly back sufficient to release the tension in the coupling system.

1.1.11 The runaway rake traversed two level crossings (Matipo Street and Whiteleigh Avenue) in the wrong direction before crossing over to the up main. As a result the protection at these two crossings was not activated until the wagons had arrived at the actual crossing[3]. No road traffic was reported at either crossing.

1.1.12 The rake then crossed five other crossings (Lincoln Road, Grove Road, Selwyn Street, Antigua Street and Montreal Street) but as it was then on the correct main for the direction of travel the level crossing protection activated as intended.

1.1.13 As the rake travelled through Addington (some 2.5 km from Middleton) the signalman left his signal box and tried to apply the handbrake on the last wagon. However he was not able to safely board the moving wagon to achieve this. He estimated the speed of the rake to be approximately 20 km/h.

1.1.14 Meanwhile, the Middleton Operations Controller chased the runaway wagons by road and arrived at Waltham, approximately 5.3 km from Middleton, just as the rake arrived there. The speed of the rake was slow enough to enable him to open the brake tap on the rear wagon and bring the rake to a halt at approximately 10 km MSL. He then applied sufficient handbrakes to secure the rake.

1.2 Site details

1.2.1 The main line gradient at Middleton was a 1 in 226 downgrade towards Christchurch over a distance of approximately 1.3 km. The gradient then flattened progressively through 1 in 440 to level at Waltham.

1.2.2 The main line track through Middleton had recently been relaid in heavyweight welded rail.

1.3 Operating rules

1.3.1 Tranz Rail Limited (Tranz Rail) Rules and Regulations, Automatic Air Brake Rules, included:

> **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 locomotive is detached. Sufficient hand brakes must first be applied to hold the train stationary.
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> (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 brakes are applied on the train before closing the air brake coupling cocks at the point of detachment.

[3] The crossing alarms were activated by the passage of rail vehicles over an insulated track joint at a distance sufficiently in advance of the crossing to give ample warning to road traffic. The crossing alarms were deactivated as the last axle of the train passed over a second insulated joint immediately following the crossing. For tracks with one-way running (as in this case), the reversal of movement meant that protection was not activated until the rail vehicle was at the crossing.

1.4 Personnel

1.4.1 The acting TXO had 21 years railway experience, all in the Christchurch and Middleton yards. He had progressed from a traffic operator, to wagon recorder, shunter, senior shunter, rail operator and then to operations assistant. He was also trained and certified as a train examiner, and acted in that capacity on occasions. He held a current operating certificate for the duties concerned.

1.4.2 The LE had over 43 years railway experience and was familiar with the Christchurch area. He gained his first grade certification in 1967 and had a current operating certificate.

1.4.3 The work and recreational patterns of both staff were normal and they were in good health.

2. Analysis

2.1 The chain of significant events leading to the main line runaway was:

- Tranz Rail's operating procedures permitted Train 823 to be stopped for servicing on the main line.
- The acting TXO closed the air brake coupling cocks before ensuring that the air brakes had been applied.
- The acting TXO did not apply "sufficient" handbrakes before he detached the locomotives.

2.2 Wagon runaways can occur for a variety of reasons. There are a number of methods available for protecting the main line in the event of a runaway occurring in a yard or loop. The practice of leaving wagons detached on the main line bypassed these potential defences.

2.3 The LE was unaware that the acting TXO had closed the air brake coupling cocks before the LE made his intended train brake application. As a result the air brakes on the wagons were not applied.

2.4 Contrary to Tranz Rail Rule 156(b) the acting TXO closed the air brake coupling cocks before ensuring that the brakes were applied on the train.

2.5 Although radio communication was available between the acting TXO and the LE it was only used to request an "ease up" to assist in uncoupling. The acting TXO could have used his radio to check with the LE the status of the air brakes on the train before closing the air brake cocks.

2.6 Contrary to Tranz Rail Rule 156(a) "sufficient handbrakes" were not applied to secure the train. This was a practice that had become accepted by some yard staff at Middleton for short periods such as servicing stops. As a result full reliance was being placed on the air brakes to hold the train.

2.7 The movement of the detached wagons was initiated by the "ease" up, the 1 in 226 main line downgrade and the smooth running surface of the welded rail. The rake would have accelerated slowly over the initial 1.3 km of the 1 in 226 downgrade, been at maximum velocity as it entered Addington, and decelerated slowly over the latter half of the 5.3 km as the gradient flattened.

2.8 The Addington signalman responded rapidly to indications on his signal panel. His action in resetting the route for the runaway rake ensured that adequate level crossing protection was reinstated as soon as possible.

3. Findings

3.1 The cause of the runaway was that neither air brakes, nor sufficient handbrakes, were applied to secure the coal wagons before the locomotives were detached.

3.2 The practice of leaving detached wagons on the main line bypassed defences which could have protected the main line in the event of a runaway from the yard.

3.3 The practice of leaving detached wagons on the main line without handbrakes applied was contrary to Tranz Rail's Rules and was an unsafe practice.

3.4 It is likely that rakes of wagons had been left on the main line without handbrakes applied on previous occasions.

3.5 The failure of Tranz Rail's staff to comply with Automatic Air Brake Rule 156(b) meant that the air brake coupling cocks were closed before the auto brakes were applied.

3.6 Tranz Rail's compliance monitoring system had failed to detect these unsafe practices.

4. Safety Actions

4.1 Following the incident the Terminal Manager, Middleton issued instructions requiring coal trains that were stopping at Middleton for servicing to berth in the loop "whenever possible".

5. Safety Recommendations

5.1 On 11 December 1998 it was recommended to the Managing Director of Tranz Rail that he:

5.1.1 Reviews the desirability of leaving rakes of wagons detached on main lines during locomotive servicing, (102/98); and

5.1.2 Implements procedures to assure compliance with the rules for securing detached wagons left on the main line. (103/98)

5.2 On 22 January 1999 the Managing Director of Tranz Rail responded as follows:

5.2.1 Tranz Rail intends to adopt the safety recommendations 102/98 and 103/98.

At Middleton instructions have been issued to ensure the normal method of handling trains requiring locomotive servicing is to berth them on other than the main line.

Tranz Rail will continue its ongoing education of assuring compliance with all the rules and operating instructions including the securing of detached wagons left on the main line.

Approved for publication 31 March 1999

Hon. W P Jeffries
Chief Commissioner