



NO. 94-102

TRAIN 624

COLLISION WITH TRACK GANG

OPAPA, HAWKES BAY

19 JANUARY 1994

ABSTRACT

On 19 January 1994, NZRL Train 624 collided with a track gang at Opapa, Hawkes Bay. Two track maintainers were seriously injured and several heavy power tools were damaged.

TRANSPORT ACCIDENT INVESTIGATION COMMISSION

RAIL ACCIDENT REPORT NO 94-102

Train Type and Number: Express Freight, 624

Locomotive: DC 4571

Date and Time: 19 January 1994, 0946 hours

Location: Palmerston North-Gisborne Line, 136.70 km, near Opapa Station

Type of Occurrence: Collision with track gang

Persons on Board: Crew: 2

Injuries: Crew: Nil
Other#: 2 Serious
2 Minor

Nature of Damage: Locomotive: Nil
Track equipment: Substantial

Information Sources: Transport Accident Investigation
Commission field investigation

Investigator in Charge: Mr A J Buckingham

Track Gang

1. NARRATIVE

1.1 Train 624 was a New Zealand Rail Limited Wellington-Napier express freight service, hauled by locomotive DC 4571. The gross train weight, including locomotive, was approximately 262 tonnes. The locomotive was being driven by a Locomotive Engineer who had been recently transferred to Palmerston North, and was “learning the road” under the supervision of a senior Locomotive Engineer who was seated at the Train Operator’s position on the left side of the cab.

1.2 The train was operating under Track Warrant Control, and held a Track Warrant for the section between Woodville and Hastings. (See Appendix for explanation of Track Warrant Control.) The Locomotive Engineers were in possession of a semi-permanent train advice which included details of speed restrictions on the line. One of these restrictions was for a track irregularity at the 136.700 km point, approximately 800 m north of Opapa Station, limiting the speed over the section between 136.64 and 136.75 km to 40 km/h. The normal speed limit through the curve where the irregularity was located was 70 km/h. (Note: 136.700 km is the distance of the point from the origin of the line, in this case Palmerston North.)

1.3 Passing Opapa Station, the locomotive crew noticed track maintainers’ vehicles parked near the station, but no sign of the maintainers themselves. As the train was being braked for the 40 km/h speed restriction, both crew members noticed another maintenance vehicle parked ahead, between the railway line and the adjacent State Highway 2.

1.4 A few seconds later, the Locomotive Engineer in the driving position sighted a motor trolley on the tracks, with a number of track maintainers working on the track beyond the trolley. He applied emergency braking while shouting a warning to the Engineer in the left seat; the latter sounded the locomotive’s air horn, but they were unable to stop the train or warn the track gang in time to prevent the train from colliding with the trolley. Two track maintainers were struck and seriously injured, two escaped with minor injuries and a fifth, who had been clear of the track, was uninjured.

1.5 The locomotive came to a halt 107 m past the point of collision with the train straddling the site, and the

senior Engineer informed Wellington Train Control of the collision. After ascertaining that there were serious injuries to some of the track gang, he requested emergency services; these attended promptly, and the two seriously injured persons were flown out by rescue helicopter.

1.6 The track gang, comprising four track maintainers under the charge of a Ganger, had been working on the site for just over an hour, repairing the track irregularity which had caused the speed restriction. The work involved the use of heavy power tools, necessitating the use of ear protection by the operators.

1.7 At 0945 hours, the Ganger was preparing to clear the site, when he noticed the train approaching, only 60 to 70 m away. Some of the gang were still operating machinery, and were facing away from the approaching train. The Ganger’s shouted warning and the locomotive’s horn blast were drowned out by the noise of the track machinery, and consequently, some of the gang received no warning of the impending collision.

1.8 The Ganger had checked in with Train Control by trackside telephone at 0817 hours in order to plan his work around projected train movements. He made this call from the telephone at Opapa Station, but when he identified the telephone to Train Control, he reported that he was at “one five six”, and advised that he wished to work at “one five six seven hundred”. The Train Control Officer checked the 156.700 km point on his train movement graph, and marked out a time block accordingly. He notified the Ganger that Train 624 was due at Otane (14 km south of Opapa) about 0925 hours, and gave him a “track clear” (i.e. a time to be clear of the track, with a safe margin built in) time of 0945 hours.

1.9 The Train Control Officer (TCO) had based the “track clear” time on the distance given him by the Ganger, 156.700 km point, which is 2.76 km south of Hastings Station. However, the Ganger had inadvertently quoted the wrong distance, and also evidently missed the significance of the train’s estimated time of arrival at Otane. Had the “track clear” time been based on the correct distance of 136.700 km point, the “track clear” time would have been about the same time as the train’s arrival time at Otane, thereby allowing a safety margin of 15 to 20

minutes. Normally, when a Ganger or other person requiring entry onto the line contacts Train Control with his request, the TCO will verify the position by reference to a geographical point, for instance in this case by asking the Ganger to identify what stations (or other significant points) between which the work was to take place. Although this procedure was not followed rigidly in this case, the same result was achieved in a slightly different form by the TCO's advice that the train was due at Otane at a specific time.

1.10 The Ganger would normally have communicated with Train Control by radio, but on the day of the accident, there was a fault in the set with which he had been issued. Had radio communication been used, it is possible

that the locomotive crew would have heard the exchange and been forewarned of the presence of track maintainers ahead, but again, if the incorrect distance had been given, the crew would not have expected to encounter the gang until almost at Hastings.

1.11 Track protection, i.e. the placing of detonators on the rail to warn train crews of obstructions or works ahead, was not utilised on this occasion as the gang felt that it was not justified. They had, however, placed detonators at the top of the Opa Bank (a 2 km grade to the south of Opa) the previous day, when they had been working at the bottom of the grade. The operating rules currently in force did not specifically require them to place protection, but the option of doing so was open to them.

2. FINDINGS

2.1 The train was being operated correctly.

2.2 The Locomotive Engineers were aware of the speed restriction in force at the 136.700 km point.

2.3 The train crew had a track warrant giving their train possession of the track, and could justifiably expect other vehicles and staff to be clear of the track.

2.4 The locomotive crew had no prior knowledge of the presence of the track gang before they sighted them while slowing for a speed restriction.

2.5 There was insufficient distance available in which to stop the train before it collided with the gang and their equipment.

2.6 The Ganger had notified Train Control incorrectly that the gang would be working at the 156.700 km point, when in fact they were at the 136.700 km point.

2.7 The Train Control Officer had based the "track clear" time on the erroneous information given by the Ganger.

2.8 The Ganger failed to realise that the Train Control Officer's advice that the train was due at Otane at 0925 hours was inconsistent with a "track clear" time of 0945 hours, which left no safety margin.

2.9 Track protection was not utilised by the gang, nor was it specifically required by the current rules. The option of placing track protection was, however, available to them.

3 May 1994

M F Dunphy
Chief Commissioner

Track Warrant Control

Track Warrant Control was introduced to the New Zealand Rail network in 1988, and is a system of protecting trains and other equipment operating on the main line. The system is based on positive control by the Train Control Officer (TCO), and a Track Warrant is essentially a clearance to enter a designated section of main line. Although, in most cases, a Track Warrant gives the holder sole occupancy of a section, there is provision for shared occupancy, with specific rules applicable to that situation.

A Track Warrant is issued by the TCO to the Locomotive Engineer in charge of a train or the operator of a track machine, by radio or telephone. The warrant is transmitted in a set format and copied onto a prepared form by the recipient, who then reads the information back to the TCO. The warrant is considered valid when the contents have been read back correctly and the time at which the readback is received has been noted by both parties.

Track Warrants are prepared on computer, except at locations where low train density does not justify the use of computers. The computer software has built-in checks to assist in preventing the issue of a warrant for a section while another is in force for the same section.

Progress of trains (or self-propelled track machines, such as ballast tampers) is plotted by the TCO on a train

movement graph, which is essentially a time versus distance graph overlaid with the location of significant points such as stations and crossing loops, and the projected movements of scheduled trains. The TCO plots the known progress of trains, Track Warrants issued, and the presence of machinery or track gangs on the line. With the graph, the TCO can tell at a glance what the traffic situation is in his area of jurisdiction. Notwithstanding that a train may be holding a Track Warrant for a section, the TCO can permit the entry onto the main line of track gangs or light inspection vehicles, and by reference to the graph, gives them specific times at which the track must be vacated. Normally, a minimum time buffer of 15 minutes is allowed, and it is the responsibility of the occupier to be clear of the track by the nominated time.

In the situation described in this accident report, the Ganger received clearance to work on the track, and was given a "track clear" time of 0945 hours. Had the gang been working at the 156.700 point on the line, the buffer time would have been sufficient. The normal procedure of relating the kilometrage to known points on the line was not followed rigidly in this instance, but the TCO's advice that the train was due at Otane at a specific time should have compensated for this. After this accident, the need for positive verification of position was reiterated to all TCO's.