NO. 94-110

DRIVING CREEK RAILWAY

COROMANDEL

2 APRIL 1994

ABSTRACT

On 2 April 1994 a locomotive and carriage on the 15 inch gauge tourist railway at the Driving Creek Potteries near Coromandel lost adhesion and slid down a 1 in 17 grade until they derailed by partially overturning on a sharp curve. The safety issue identified in the investigation was the need to ensure that traction could be maintained at all times.

TRANSPORT ACCIDENT INVESTIGATION COMMISSION

RAIL ACCIDENT REPORT NO. 94-110

Train Type and Number:	Driving Creek Pottery Tourist Train
Locomotive:	"Elephant"
Date and Time:	2 April 1994 1415 hours
Location:	Driving Creek Pottery, Coromandel Near Revington Station
Type of Occurrence:	Derailment
Persons on Board:	Crew: 2 Passengers: 22
Injuries:	Crew: Nil Passengers: Nil Others: Nil
Nature of Damage:	Nil
Information Sources:	Transport Accident Investigation Commission field investigation
Investigator in Charge:	Mr W J D Guest

1. NARRATIVE

1.1 The Driving Creek Railway is a tourist attraction at the Driving Creek Potteries, a short distance from Coromandel. The 15 inch gauge track winds for nearly two kilometres through regenerating native forest to reach several vantage points above the potteries from which views of the Coromandel area can be enjoyed. The railway is in rugged hills, and passes through two small tunnels, and over seven bridges. A spiral and a switchback have been incorporated to cope with the difficult terrain. The steepest grade is 1 in 16, and the sharpest curve is 11.5 m radius.

1.2 The maximum speed of the trains is 10 km/h. They usually travel at 6-8 km/h.

1.3 On 2 April 1994 the diesel locomotive and a carriage with 22 passengers and 2 crew on board lost adhesion while going down a grade of 1 in 17 when the wheels of the carriage locked under braking, and the train slid downhill. Light rain was falling, and tree litter had contributed to a greasy film on the rails.

1.4 The driver attempted to discharge sand on to the rails, but there was no apparent effect.

1.5 The train gathered speed, and after sliding approximately 45 m entered an 11.5 m radius curve in a cutting. It tipped towards the outside of the curve and came to rest against the vegetation.

1.6 There were no apparent injuries, and passengers were escorted back to the terminal at the potteries on foot.

1.7 An examination by the railway's maintenance staff showed that the sand pipes on the locomotive were not in the optimum position for applying the sand on to the head of the rail while travelling around a sharp curve.

1.8 After the incident, the brackets were modified to improve the position of the sand discharge.

1.9 The tipping speed of the train in the curve was calculated to be between 18 and 20 km/h, about 10 km/h faster than the normal maximum train speed. Even allowing for some friction, this speed increase could be gained in 35 to 50 metres down the 1 in 17 slope.

1.10 The railway has used a conventional locomotive and carriage consist for several years, but has recently built a new train which is powered on all axles. A principal reason for the new design was to improve the traction and reduce the possibility of incidents such as this.

2. FINDINGS

2.1 The combination of wet weather and litter from the surrounding vegetation resulted in a greasy film on the surface of the rails.

2.2 The driver's application of the brakes to control the speed down the slope did not have the intended effect because the film on the rails allowed the wheels of the carriage to lock and the train to slide.

2.3 The sand which the driver attempted to apply to increase the adhesion of the wheels on the rails was ineffective because insufficient of it was deposited on the top of the rails.

2.4 The train derailed because it entered a sharp curve some 10 km/h in excess of the safe speed for that curve.

2.5 The correct application of sand at the commencement of the slide would probably have enabled the driver to regain control of the braking.

2.6 The sand pipes were not located in the optimum position to discharge sand on to the head of the rails while the train was moving round a curve.

2.7 If the train had been powered on all axles, the combined braking effects of all wheels being controlled by the engine would probably have enabled the driver to arrest the slide.

3. SAFETY RECOMMENDATIONS

3.1 It was recommended to the Driving Creek Railway that they:

3.1.1 Do not use the locomotive and carriage consist on days when there is a build-up of wet leaf litter on the rails, but instead use the articulated train which has traction on all wheels (051/94).

3.1.2 Install an emergency sanding system to provide an alternative method of enhancing the wheel/rail adhesion should the normal sanding system fail to work effectively (052/94).

3.2 The Driving Creek Railway advised that the carriage was being converted to an all-wheel-drive railcar, and that an emergency sanding system had been fitted to the articulated train and would also be fitted to the railcar.

12 October 1994

M F Dunphy
Chief Commissioner