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Australian Transport Safety Bureau

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ATSB TRANSPORT SAFETY REPORT
Rail Occurrence Investigation RO-2010-004
Preliminary

Collision between XPT passenger train WT27 and a track-mounted excavator near Newbridge, New South Wales 5 May 2010

Figure 1: Leading power car XP2008

Abstract

At about 1113[1] on 5 May 2010, XPT passenger train WT27, travelling from Sydney to Orange, New South Wales collided with a track-mounted excavator on the main line between Bathurst and Newbridge. The XPT was travelling at about 69 km/h at the time of the collision.

The excavator and a utility vehicle were severely damaged; the leading power car of the train received moderate damage.

The operator of the track-mounted excavator was fatally injured and one train passenger incurred minor injuries.

The investigation is continuing.

1 The 24-hour clock is used in this report. Eastern Standard Time (EST) was Coordinated Universal Time (UTC) + 10 hours. Unless shown otherwise, all times are EST.

FACTUAL INFORMATION

The information contained in this preliminary report is derived from the initial investigation of the occurrence. Readers are cautioned that there is the possibility that new evidence may become available during the course of the investigation which may alter the circumstances as depicted in this report.

Location

The collision occurred on the main line between Bathurst and Newbridge in New South Wales (NSW) about 270.512 track km from the Sydney Central Station; about 3.2 km east of the Newbridge railway station. A sweeping 290 m radius left curve commenced at the 270 track km point and extended almost 780 m on a 1:77 downhill grade leading into the collision site.

Train information

XPT passenger train WT27 was owned and operated by RailCorp NSW (trading as CountryLink) and consisted of a lead power car XP2008, four trailing passenger cars, and a trailing power car XP2011. The train had a total mass of 176 t and an overall length of 131.4 m. The train was crewed by one driver, a Passenger Service Supervisor, a Senior Passenger Attendant, and two Passenger Attendants. There were 71 passengers on board at the time of the collision.

Track infrastructure

The section of track between Bathurst and Newbridge is owned by the Rail Infrastructure Corporation (RIC). The track is managed and maintained by the Australian Rail Track Corporation (ARTC) under a lease agreement.

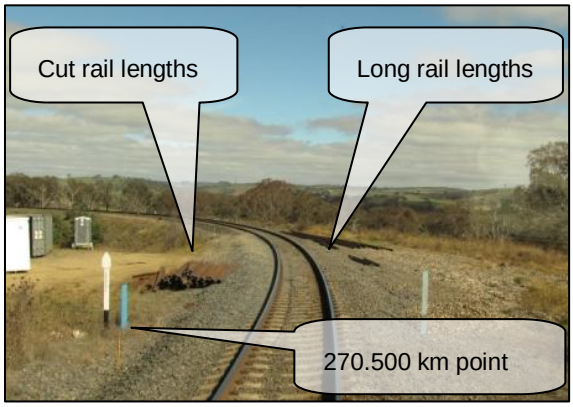
The section of track near the collision site, consisted of a single line with train traffic able to travel in either Up[2] or Down directions. The track comprised 60 kg/m rail fastened to concrete sleepers, spaced at 660 mm, by elastic fasteners in a bed of rock ballast with a nominal depth of 400 mm.

2 Up direction trains head towards Sydney and down direction trains head away from Sydney.

Trackwork

Due to wet weather conditions affecting planned work on the day of the collision, the ARTC work group manager at Bathurst had arranged for ad-hoc work to be undertaken at the 270.512 km mark. Work comprised reclamation of used rail by oxyacetylene cutting into manageable lengths, then transferring the sections to the other side of the track for collection and removal by truck (see Figure 2). The workgroup consisted of an ARTC Protection Officer (PO) and two private contractors engaged by ARTC as labourers. One contractor was the operator of a track-mounted excavator and the second contractor was responsible for cutting the rail lengths.

Figure 2: Worksite layout



The excavator, a Komatsu PC40MR-2, was used to transfer the cut rail lengths to the other side of the track for collection and removal. The excavator had an operating weight of 4.79 t and was fitted with Hi-Rail wheels enabling it to mount and operate on the track. The maximum speed of the excavator was 4.6 km/h.

Train management

Train movements in the section of track between Bathurst and Newbridge were controlled by an ARTC Network Controller located in the Broadmeadow Train Control Complex.

The occurrence

At 0700, the ARTC infrastructure teams based in the Bathurst depot signed on duty and attended a 'tool box' meeting to discuss planned work and other agenda items, including an OH&S presentation on generic safe-work practices. The meeting ended about 2 hours later. After the meeting, the PO and both contractors had a meal

break and were advised to prepare for work near Newbridge reclaiming rail. The work team departed the ARTC Bathurst depot between 1020 and 1030, arriving onsite between 1045 and 1050. The PO indicated that upon arriving at the site, a pre-work safety brief was conducted near the truck. The truck was parked about 15 m from the track facing towards Newbridge, opposite the long rail lengths on the other side of the track.

Train WT27 departed Sydney Central Station on time at 0710 bound for Orange. The train was scheduled to run on the normal timetable until Orange, then terminate due to trackwork[3] between Orange and Dubbo. At 1049, the train arrived at Bathurst, 6 minutes late, and departed at 1051, still 6 minutes late. An ARTC track maintenance inspector boarded the lead power car at Bathurst to perform a regular track inspection through to Orange.

At 1054, the ARTC worksite PO called the Network Controller at Broadmeadow and requested a Track Occupancy Authority (TOA). During the conversation all relevant parts of the TOA were completed.

The TOA was repeated back as correct by the PO, as required before authorisation.

At 1058, the TOA was authorised for the section of track between signal BT56 at Bathurst and signal NE1 at Newbridge. The TOA was issued to the PO on the understanding that train WT27 was already within the section.

After the TOA was authorised, the PO advised the other work team members that the TOA had been obtained, to prepare for work, and that he was going to put the warning flags and detonators[4] out. The other work team members moved the utility vehicle alongside the track. One member laid the oxyacetylene hoses out across the track to the cutting area, and the other started the excavator and revved it to warm it up to operating temperature.

After finalising the worksite protection plan in the cabin of the truck, the PO changed into full wet weather gear as there was light rain falling. Shortly after, the rain eased and the PO subsequently removed his wet weather pants. He then returned to the truck with the intent of travelling towards Newbridge to place the flags and detonators.

At 1113, after exiting a cutting on a sweeping left curve in advance of the worksite, the leading power car XP2008 of train WT27 collided with the track-mounted excavator. At the time, the XPT was travelling at a speed of about 69 km/h[5]. The PO who was in the truck and about depart, heard a loud bang. He turned and saw the lead power car of an XPT pushing the excavator which had mounted the track with its boom extended.

The excavator was propelled along the track for a distance of 20 m until the extended boom struck a utility vehicle parked alongside the track. On impact, the excavator derailed and came to rest on the formed embankment. The operator of the excavator was ejected from the cab during the collision sequence and was fatally injured. The excavator finally came to rest about 38 m from the point of impact. Train WT27 came to a stand about 194 m from the point of impact (Figure 3). First aid was rendered to the excavator operator by the other ARTC team members, an off-duty train driver, and two off-duty nurses, but to no avail.

A passenger on the train suffered a minor injury as a result of the collision.

Post occurrence

Emergency services were advised and attended. Passengers remained on the train. The four passenger cars, with passengers on board, were hauled back to Bathurst at 1510 by the trailing power car XP2011 and arrived at 1603.

Passengers disembarked at Bathurst and boarded buses for their destinations.

The train driver and PO were breath tested by NSW Police, returning a zero reading.

3 Advertised in ARTC Train Alteration Advice 0332-2010.

4 A device that explodes on impact used to warn drivers and track vehicle operators of the condition of the track ahead.

5 Derived from preliminary analysis of the Hasler tape from power car XP2008 –adjusted for actual wheel diameter.

Figure 3: Resting point of excavator, utility vehicle, and lead power car

PRELIMINARY ACTIVITIES

On 5 May 2010, investigators from the Australian Transport Safety Bureau (ATSB) attended the site of the collision to collect evidence, including to conduct a site survey, and take photographs and measurements. The train data loggers (Hasler tapes) from both power cars were obtained. In addition, the vigilance control module from leading power car XP2008 was removed for further examination.

SAFETY ACTION

The Independent Transport Safety and Reliability Regulator of New South Wales (ITSRR) issued a Rail Industry Safety Notice No. 31 on 25 May 2010 reinforcing the rule requirements for protecting worksites and the issue of Track Occupancy Authorities. This notice was issued to all accredited operators and rail infrastructure managers operating throughout NSW.

FURTHER INVESTIGATION

The ATSB will continue to source additional information from the ARTC, RailCorp, ITSRR, NSW Police and other agencies that are, or may become, involved.

Based on initial evidence, the ATSB investigation will focus on a number of issues, including:

- worksite protection and procedures
- circumstances surrounding the issue of the Track Occupancy Authority on 5 May 2010
- collision response
- human factors issues
- safeworking rules, procedures, and forms
- historical worksite audits
- history of similar events.