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- independent investigation of transport accidents and other safety occurrences
- safety data recording, analysis and research
- fostering safety awareness, knowledge and action.

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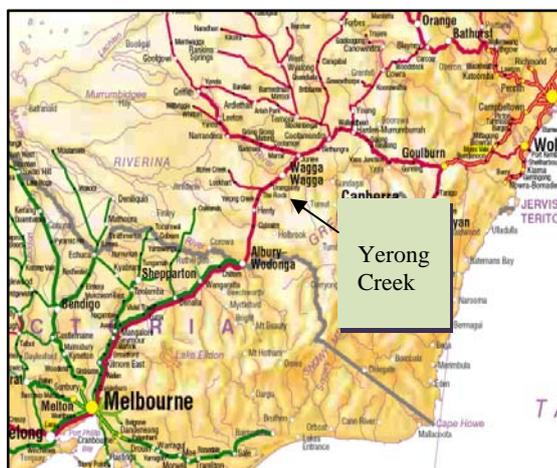
Signal passed at danger Yerong Creek, New South Wales 25 February 2011

Decisions regarding whether to conduct an investigation, and the scope of an investigation, are based on many factors, including the level of safety benefit likely to be obtained from an investigation. For this occurrence, a limited-scope, fact-gathering investigation was conducted in order to produce a short summary report, and allow for greater industry awareness of potential safety issues and possible safety actions.

Abstract

At about 1028 (Eastern Daylight Saving Time) on Friday 25 February 2011, a southbound Brisbane to Melbourne freight train passed the home signal at Yerong Creek at red (Stop) without authority. Yerong Creek is about 387 km from Melbourne and 565 km from Sydney on the main Sydney to Melbourne rail line. There were no injuries or damage as a result of the incident.

Figure 1: Location of Yerong Creek



FACTUAL INFORMATION

Sequence of events

Train 4BM7 consisted of locomotives LDP 009, CLP 9 and CLP 12 hauling 47 wagons for a total length of 1,115 m and gross weight of 2163.4 tonnes. The maximum permitted speed of train 4BM7 between Sydney and the New South Wales-Victoria border at Albury was 115 km/h. Train 4BM7 was being worked from Junee to Melbourne by a Melbourne-based crew that consisted of a driver and a second person. This crew had worked a northbound freight train from Melbourne to Junee on Wednesday 23 February and had arrived at Junee at about 0230 on Thursday 24 February. They then spent the ensuing 31 hours off duty at Junee, resting in motel accommodation. At 0923 on Friday 25 February 2011, this crew departed Junee on train 4BM7 for a return to Melbourne.

The driver of train 4BM7 said that the train was handling well and that the train brake was effective when applied for a running brake test shortly after leaving Junee.¹

On the approach to Yerong Creek, the driver saw that the distant signal was displaying a yellow (Caution) indication. He then progressively reduced power to zero and engaged dynamic brake. Because the dynamic brake was not slowing the train sufficiently, a minimum train brake application was also made. The driver then saw the home signal (identified as signal YC05) at

1 A running brake test does not involve the use of dynamic brake.

red (Stop) and made a full service train brake application while retaining the dynamic brake application at maximum rate. Shortly after, the driver made an emergency application of the train brake, but train 4BM7 did not stop before the Yerong Creek home signal.

After a couple of minutes, the driver of train 4BM7 contacted the Junee Network Control Centre and enquired about why signal YC05 was at red. The network controller who answered the call said that Yerong Creek was controlled by an adjacent train control board. At this time though, the network controller in charge of the controlling board was not at his work station. The network controller who answered the call from the driver of 4BM7 did not have a detailed view of the status of the field equipment at Yerong Creek. However, being in close proximity to the controlling board (the adjacent work station), he was aware that the signal had been at stop because of a previous track possession between Yerong Creek and Henty. The driver of train 4BM7 then asked if they were able to proceed; the network controller responded in the affirmative, adding that it looked like the route was now set as far as Gerogery (51 km south of Yerong Creek). The driver of train 4BM7 did not tell the network controller that he had passed signal YC05 at stop.

Shortly after, the network controller at the controlling board returned to his work station and noticed that a visual SPAD alarm had activated.² At about 1050 he called the driver of train 4BM7 to enquire what happened. The train driver said he had passed the signal by about an 'axle length' but had been given permission by the other network controller to proceed. The driver of train 4BM7 was then told to stop at Culcairn and wait for further instructions. Culcairn is about 31 km from the SPAD location at Yerong Creek.

At an interview with company officials, the driver of 4BM7 revised the estimated distance the train passed signal YC05 from 'an axle length' to about 50 m. He also said that the train was not braking as well in dynamic braking as he thought it would. However he did not believe the performance of the train was dangerous nor did he report the braking issue to maintenance personnel.

² This alarm activates visually at the 'controlling' board only and has no audible component.

A review of the voice logs from the Junee Network Control Centre indicated that the network controller responsible for overseeing the controlling board applicable to train 4BM7 was absent from this board for up to 20 minutes.

Recorded data

Data from the locomotive data recorders was downloaded and forwarded to the Australian Transport Safety Bureau (ATSB). Key events from the recorded data are summarised in Table 1, and these events are based on the train passing signal YC05 by 50 m.

Table 1: Key events from recorded data

Time	Details
1026:33	Speed 78 km/h, dynamic brake engaged, 1,758 m from signal YC05.
1026:52	Speed 78 km/h, full dynamic brake engaged, 1,342 m from signal YC05.
1027:17	Speed 78 km/h, brake-pipe reduction initiated, 793 m from signal YC05.
1027:25	Speed 77 km/h, full service brake-pipe reduction achieved, 620 m from signal YC05.
1027:39	Speed 69 km/h, brake-pipe 220 kPa, dynamic brake dropped out, 330 m from signal YC05. Emergency braking enacted, independent brake applied on all three locomotives.
1028:02	Speed 30 km/h, signal YC05 passed at red.
1028:14	Train 4BM7 stopped 50 m beyond signal YC05.

The recorded data also indicated that the dynamic brakes on the two trailing locomotives, CLP 12 and CLP 9, did not engage on the approach to home signal YC05. This meant that, until the application of the independent brake at the time of the emergency brake application, locomotives CLP 12 and CLP 9 were 'free-wheeling'. Both locomotives had a combined weight of about 260 tonnes and, as such, represented about 15% of the train's gross weight.

The distant signal at Yerong Creek is about 3.6 km from home signal YC05 and is almost on the crest of a 6 km rising gradient. Between the distant signal and home signal YC05 the grade falls, in an undulating manner, for almost the entire 3.6 km at rates as steep as 1:87.

The recorded data showed that train 4BM7 was beyond the distant signal and that virtually the whole length of the train (1,115 m) was on the falling grade when the locomotive dynamic brake was first engaged. If dynamic brake is to be used in such topography (rather than the train brake), it is essential to ensure that the whole train has crested the grade before engaging dynamic brake, otherwise the train will transition from a draft (stretched) to buff (bunched) condition with greater force and unpredictability.

The data basically corroborated the train handling method described by the driver of train 4BM7 and his contention of sub-optimal dynamic braking performance.

The train driver

The train driver had been qualified as a driver for about 3 years. He had operated over the Melbourne to Junee section of track as a second person for about 7 months and had been qualified to drive over this section for 1 month. The 25 February 2011 trip from Junee south was the first time he had operated over this section of track during daylight hours. He had been assessed as competent to drive over the route by an employee of a company subcontracted to Interail Australia.

Post-incident measures

The train crew were tested for the presence of alcohol or illicit drugs at Culcairn and were relieved from duty at 1311. The drug and alcohol tests returned zero results.

ATSB COMMENT

Train 4BM7 was driven in a manner that reduced the in-train forces as it crested the rising gradient at the distant signal on the approach to Yerong Creek. Notwithstanding this, and the sub-optimal dynamic braking performance of the train, an earlier application of the dynamic brake or earlier introduction of the train brake 'over the top' of the dynamic brake was needed on this occasion.³

The incident highlights the need for frank and complete reporting by persons in the field to network controllers in regard to operations on the rail network. In this instance, the driver of train 4BM7 was 'silent' on the issue of the location of his train in relation to red signal YC05 at Yerong Creek. The network controller, not being at the controlling board applicable to train 4BM7, had no information that signal YC05 had been passed at red.

In addition, the incident highlights the need for a network controller to be effectively monitoring the movement of trains at each active workstation.

3 Every train has differing braking characteristics. This is one of the reasons why a running brake test is conducted as soon as practicable after a crew change-over. Within reason, train drivers are required to adjust driving styles according to the braking characteristics of their train.