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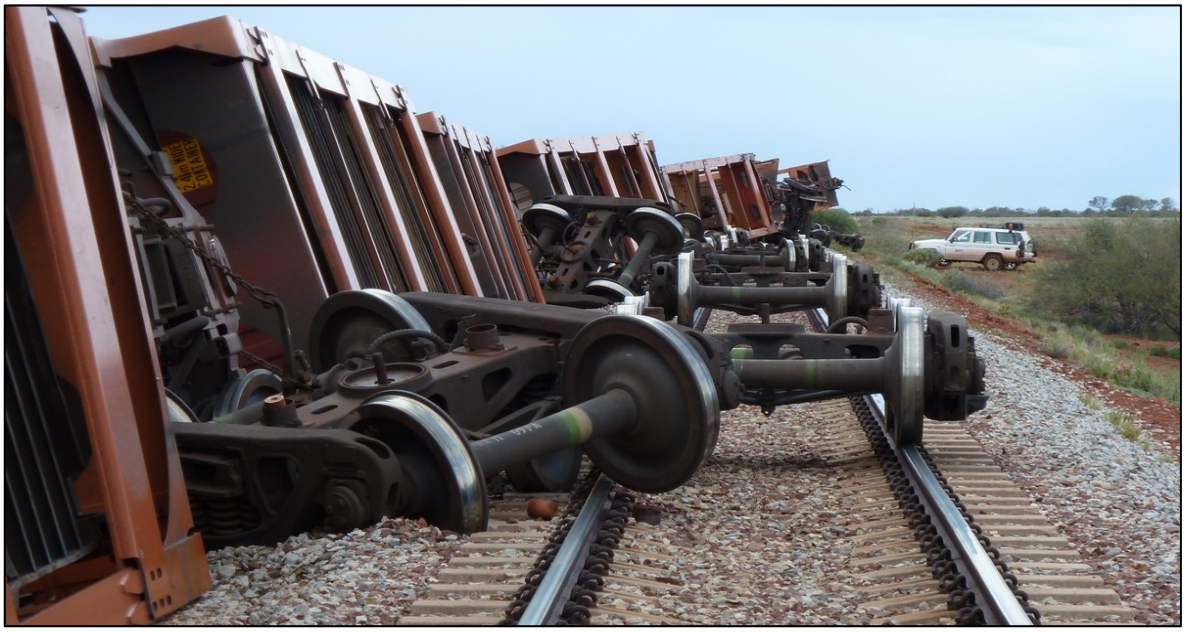
ATSB TRANSPORT SAFETY REPORT
Rail Occurrence Investigation RO-2010-012
Preliminary

Derailment of freight train 4DA2 near Cadney Park, South Australia

25 November 2010

Figure 1: Derailment site, (rear part of train 4DA2) looking towards Adelaide



Abstract

At about 0618[1] on Thursday 25 November 2010, freight train 4DA2, operated by FreightLink Pty Ltd[2], derailed on the Central Australian Railway line just south of Cadney Park in South Australia. There were no injuries as a result of the derailment but there was significant damage to rolling stock and about 300 m of track required renewal.

The investigation is continuing.

The information contained in this preliminary report is derived from the initial investigation of the occurrence. Readers are cautioned that it is possible that new evidence may become available that alters the circumstances as depicted in the report.

FACTUAL INFORMATION

Location and environment

Cadney Park Homestead in South Australia is a small roadhouse situated adjacent to the Stuart Highway approximately 1000 km by road north of Adelaide. The Central Australian Railway line is located about 250 m to the south-west of the

1 The 24-hour clock is used in this report. Australian Central Summer Time (CDT), UTC + 10.5 hours. Unless shown otherwise, all times are CDT.

2 Genesee & Wyoming finalised the acquisition of the assets of FreightLink Pty Ltd on 2 December 2010.

Cadney Park Homestead. The derailment occurred approximately 5 km south of the Cadney Park Homestead on a straight section of track near the 826 km[3] mark.

Track structure

The track at the derailment site comprised standard gauge (1435 mm) continuously welded AS 47 kg/m rail fastened to pre-stressed concrete sleepers using resilient clips. The track is constructed on a formation of red sand/clay based soil with the sleepers supported on a ballast bed with a minimum depth of 250 mm. Sleepers are nominally spaced at 670 mm. FreightLink Pty Ltd was responsible for management of the section of track over which train 4DA2 was travelling at the time of derailment.

Train information

Freight train 4DA2 was a regular Genesee & Wyoming Australia (GWA) accredited service consisting of two locomotives (CLP17 leading and VL359 trailing) hauling 33 freight wagons. The train was carrying mixed freight including a combination of double and single stacked containers on container flat and well[4] wagons. The train was 1395 m long and weighed a total of 2427 t including the locomotives.

The occurrence

The train originated from the Berrimah Freight Terminal, near Darwin in the Northern Territory, and was travelling to the Adelaide Freight Terminal, South Australia. The train drivers involved in the derailment booked on for duty at 2300 on Wednesday 24 November 2010. The train's departure from the Berrimah Freight Terminal and subsequent passage through the section of track where the derailment occurred was authorised by qualified Genesee & Wyoming Australia (GWA) transport controllers.

The earlier part of the journey was uneventful with the train running well and able to maintain track speed. When the train was about 250 km north of Cadney Park, the train crew observed frequent lightning activity in the distant southern sky.

On approaching Cadney Park lightning activity was intense. The driver slowed the train for the Cadney Park 'Crossing Loop'. Once clear of the loop he began to accelerate the train but noted that progress was slow because a strong southerly wind was directly opposing the train. Shortly thereafter he observed some light spots of rain on the train's front windscreen. This was followed by a torrential downpour with very strong wind that shifted through 90 degrees and was now blowing from the west and onto the right-hand side of the train. The driver became concerned with both his forward visibility and the strength of the wind and was about to slow down and stop the train when he felt a couple of light tugs followed by an observed decrease in the train brake pipe pressure. Realising that the train had probably parted and/or become derailed he slowed the train bringing it to a stand approximately 1620 m from the point of derailment.

Shortly thereafter the co-driver contacted transport control to advise that train 4DA2 had come to a stand just south of Cadney Park and was probably derailed. He further advised that they were experiencing severe weather and would not leave the safety of the locomotive, to inspect the rear of the train, until conditions improved.

After about 10 minutes the main storm front had passed so the co-driver could alight from the locomotive cab to commence the inspection of train 4DA2. He walked back towards the rear part of the train and reported that the train had parted at the 18th wagon, and the 19th through to 32nd wagon had overturned and were generally located on the eastern side the track.

The last three wagons were upright although the leading bogie of the 33rd wagon had derailed. A total of 14 wagons, all of which were 5-unit double-stacked freight well wagons, had derailed and sustained significant damage. Approximately 300 m of track was heavily damaged.

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3 Distance in kilometres from a track reference point located at Coonamia in South Australia.

4 A well wagon is a flat car having the height above rail of the underframe/deck structure lowered between the bogies to provide additional vertical load space.

Figure 2: Derailed wagons FQWY 00019W, AQQY 04327L and FPPY 07315D

Post occurrence

Investigators from the Australian Transport Safety Bureau (ATSB) were dispatched from Adelaide early on 25 November 2010, flying to Coober Pedy, then by four wheel drive to Cadney Park, arriving on site at about 1730. Once on site the positions of rolling stock, containers and track were examined and photographed. The train drivers were interviewed before they departed that evening with the undamaged front portion of train 4DA2.

Track and rolling stock recovery began on the 26 November 2010 with the track being re-opened for traffic at 1057 on Monday, 29 November 2010.

Site information

When flying into Coober Pedy, ATSB investigators noted that the surrounding area was quite dry. The distance by road from Coober Pedy to Cadney Park is about 154 km and it was not until about 10 km from Cadney Park that there was any evidence of rainfall. Closer to Cadney Park there was light shower activity and evidence of heavy precipitation with large areas inundated by water. A number of local roads that lead off the Stuart Highway and cross over the Central Australia Railway line were under water and impassable.

On arrival at the Cadney Park Homestead and following discussions with some of the local residents it was apparent that the area had experienced an extreme weather event with torrential rain and very strong winds.

To access the derailment site it was necessary to use the railway maintenance road. In driving down the road it was obvious that the area had experienced very heavy rain (consistent with the observations made by the train drivers) with many sections of the road still covered by water.

Examination of the derailment site focused on FQWY 00019W, the 21st wagon (Figure 2) in the consist, a double-stacked container (this unit was considered the initiator of the derailment), and the track in the immediate vicinity of this wagon to establish the likely point of derailment (POD).

FQWY 00019W was the first in the series of 13 double-stacked container wagons, all of which had capsized to the east of the track. The two wagons ahead of FQWY 00019W (AQQY 04327L and FPPY 07315D see Figure 2) probably derailed as a consequence of being pulled over by FQWY 00019W as it capsized.

The 33rd freight wagon (FQAY 00009R), was a single stacked container wagon, only the leading bogie of this wagon had derailed, the wagon was upright and substantially on track.

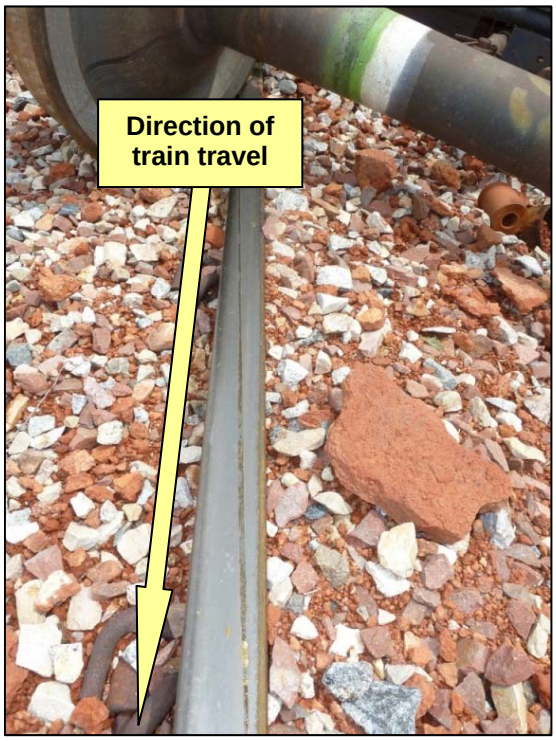
Key on-site observations:

- A single diagonal wheel contact mark[5], about 2 m in length, (Figure 3) was found on the head of the eastern rail about 70 m before the resting place of derailed wagon FQWY 00019W. The mark extended from the inside to the outside of the rail head. This indicated that a wheel had ridden up and over

5 This location was considered to be the likely POD.

the rail at this point. It then dropped off on the field side of the eastern rail. From this point on the ballast was gouged into the sub-grade as the wheels and bogie side frames of derailed wagons dragged along the track, breaking the sleeper ends in the process. About 10 m after the POD the derailed wagons also began to push the eastern rail in towards the western rail causing the gauge to narrow, escalating the derailment process.

Figure 3: Wheel contact mark



Further observations by investigators found that:

- There was no evidence of wheel drop-in on the gauge side western rail, that is, the side opposite the POD. This indicated that the wagons probably capsized and rolled over rather than being dragged through the four foot[6].
- Wagon FQWY 00019W capsized off the eastern rail. It travelled about 70 m before coming to rest, indicating that the train speed was fairly slow at the time of derailment. An examination of the skid marks, on the ground, showed that the wagon had slid only a short distance, about 20 m, on its side before coming to rest.
- Thirty metres after the POD a dislodged bogie became wedged between the eastern and western rails. Five wagons then piled up behind this bogie.
- Wagons further behind this group of five vehicles appeared to have been travelling very slowly or were stationary when they capsized as evidenced by the lack of drag marks in the ballast and adjacent ground surface where they came to rest.

Track condition

The track near the derailment site was about 1 m above the natural ground surface. It was straight, almost level and appeared to be in good condition with a full ballast profile for both shoulder and crib. There was no evidence of a broken rail, track buckle or signs of a sub-grade failure within the derailment site.

The investigation is continuing to identify possible causes of the derailment and will include an examination of the following:

- Further examination of track condition and maintenance history.
- Examination of train make-up and loading configuration.
- Train handling.
- Availability of Bureau of Meteorology (BoM) weather reports/warnings at the time of derailment.
- The reporting and distribution of information and warnings for severe weather events.
- Train risk mitigation strategies during severe weather events.

6 Four foot – The area between the rails of a standard gauge railway. (ARA Glossary for National Code of Practice and Dictionary of Railway Terminology)