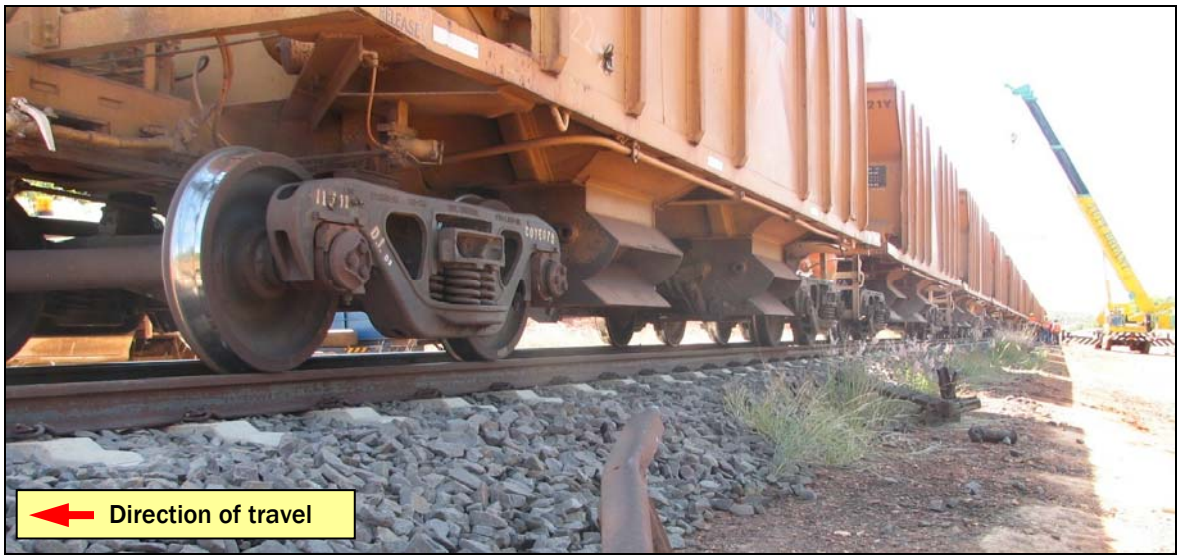
Australian Government
Australian Transport Safety Bureau

Publication Date: March 2009 ISBN 978-1-921602-19-1

ATSB TRANSPORT SAFETY REPORT
Rail Occurrence Investigation RO-2008-006
Final

Derailment of train 3DM4 near Manton Dam NT
22 April 2008

Figure 1: Wagon CHQY-739C, damaged wagon components and recovery of derailed wagons.



Abstract

At about 0542[1] on Tuesday 22 April 2008, empty southbound manganese ore train 3DM4 derailed four wagons approximately 58 km south of Darwin near Manton Dam in the Northern Territory (NT).

There were no injuries as a result of the derailment but there was minor damage to the track and rolling stock.

The investigation found that the draft key[2] on the leading end of the 31st wagon had dislodged from the coupler shank, which allowed the coupler to withdraw and fall onto the track. As a result of this the train was separated into two portions; 30 wagons that were still coupled to the locomotives and the 14 following wagons which were detached. The detached portion of the train then almost certainly passed over the dislodged coupler that was lying on the tracks leading to the derailment of four wagons.

FACTUAL INFORMATION

Location and Environment

The derailment occurred on a straight section of track near the 2,696 km[3] mark about 700 m south of the Manton River Bridge on the Central-Australian Railway (Figure 2). The track is located adjacent to the Stuart Highway near the Daly Range in rocky undulating terrain, surrounded by medium density vegetation.

1 The 24-hour clock is used in this report to describe the local time of day, Central Standard Time (CST).

2 Also known as 'Murray Key', the draft key is a flat steel bar that passes through the underframe, yoke and coupler. Its primary function is to secure the yoke and coupler as a unit within the underframe.

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

The Australian Transport Safety Bureau (ATSB) is an operationally independent multi-modal Bureau within the Australian Government Department of Infrastructure, Transport, Regional Development and Local Government.

The ATSB is responsible for investigating accidents and other transport safety matters involving civil aviation, marine and rail operations in Australia that fall within Commonwealth jurisdiction.

The ATSB performs its functions in accordance with the provisions of the *Transport Safety Investigation Act 2003* and, where applicable, relevant international agreements.

ATSB investigations are independent of regulatory, operator or other external bodies. It is not the object of an investigation to determine blame or liability.

Australian Transport Safety Bureau
PO Box 967, Civic Square ACT 2608
Australia
1800 020 616
www.atsb.gov.au

Released in accordance with section 25 of the *Transport Safety Investigation Act 2003*

INFRA-08416

Figure 2: Map showing derailment location about 70 km south of Darwin, NT.

The track structure consists of a ballast bed having a minimum depth of 150 mm supporting prestressed concrete sleepers spaced at approximately 700 mm centres. The continuously welded 50 kg/m rails are fastened to the sleepers using resilient clips.

On the morning of the derailment the weather was fine and clear with a minimum overnight temperature of 24.8 degrees Celsius recorded at the Darwin weather station.

Freight train 3DM4

Train 3DM4 is a regular bulk mineral service operated by Genesee & Wyoming Australia (GWA) under contract for Freight Link Pty Ltd (Freight Link). The train runs empty from Berrimah (Darwin) to Muckaty where manganese ore from the Bootu Creek Mine is loaded. It then returns north to Darwin for unloading at the Darwin East Arm Wharf. Muckaty is 815 km south of Darwin.

Train 3DM4 comprised three locomotives (ALF19 leading, CLF6 and VL352 trailing), a crew accommodation carriage and 40 empty CHQY and CHSY ore wagons. The length of the train was 582 m and the gross weight 1378 tonnes. Train 3DM4 was crewed by two drivers while two relief drivers rested in the crew van. The drivers work the 1630 km from Darwin to Bootu Creek and return train as a 'round trip', resting in the crew carriage at Muckaty while the manganese ore is being loaded. The driver at the time of the derailment had about 30 years train driving and rail operations management experience. Both train drivers were appropriately qualified, assessed as competent and medically fit for duty.

History of wagons

The CHQY and CHSY series of ballast wagons were manufactured in the United States between 1955 and 1959 and were originally plated as CRDX. All wagons were fitted with Type 'E' rigid shank couplers using a draft key to retain the coupler within the yoke and underframe. Initially those wagons were used for carrying cement on the Canadian National rail network.

In 2001, 65 of the wagons were shipped to Australia where modifications were made to brakes, bogies, wheelsets, control valves and structural outline dimensions to comply with Australian railway standards. In addition, the wagons were fitted with a remote ballast door operating system that replaced the original manually operated system. They were initially used for transporting and the laying of ballast in Victoria, between Melbourne and Wodonga and later assisted with ballasting operations in the Northern Territory during the construction of the Alice Springs to Darwin railway.

Late in 2005, the wagons were converted to bottom discharge hoppers and have since been used to transport manganese ore for the OM (Manganese) Ltd project between Bootu Creek to the East Arm Wharf near Darwin, NT. Wagon modifications included blocking the outer chutes, removing outer doors, adjusting the control circuits and door sequences to enable the discharge of ore between the rails. No modifications were made to the draft keys and retainer pin assemblies.

Occurrence

On the morning of the derailment, both drivers booked on for duty at 0415. The drivers noted that EDI Rail and Pacific National employees were carrying out the routine air brake tests and mechanical inspections on train 3DM4. At 0447

GWA transport (train) control authorised the train's departure from the Berrimah Terminal.

The driver reported that after leaving Berrimah, he brought the train up to the track speed of 95 km/h and recalled the train was handling normally. A routine journey was then experienced until the train was in the vicinity of the Manton River bridge, about 1 hour from Darwin. At this point the train was coasting down the grade on the approach to Manton River bridge at about 100 km/h (slightly over speed). After passing over the bridge and up the next rise, the train started to slow. At about the same time the driver noticed a decrease in brake pipe air pressure and a build up of locomotive brake cylinder air pressure. Realising that the train may have parted, he released the locomotive brakes and briefly poweredup. This action was intended to stretch the train and keep the front and rear portions apart if indeed his suspicions of the train parting were correct. The train came to a stop at approximately 0545 in a distance of about 1300 m.

Post occurrence

The co-driver alighted from the locomotive and walked back along the train to find out why the brake pipe air had been lost. Meanwhile, the driver remained with the locomotive and attempted to contact GWA transport control via satellite telephone. As contact with transport control could not be made on the first attempt, the driver contacted the GWA Depot Co-ordinator in Darwin at 0550 to advise that the train had come to a stop due to a loss of brake pipe pressure and he would advise again when further information was available. At 0605, the driver contacted transport control and advised that the train had parted with the leading-end coupler pulled out of the 31st wagon and that this had derailed at least two of the 13 trailing wagons. Transport control was also advised that the dislodged coupler had damaged various underside wagon components including brake gear, wheels, bogies and hopper doors and that it had been ejected from under the train and was now on the eastern side of the track about 170 m from the point of derailment.

Approximately 600 sleepers had also been damaged by the derailed wagons with 250 requiring replacement.

The distance between the separated portions of the train was about 300 m. Where the train had stopped, the adjacent terrain made it difficult for people to walk beside the track so the driver asked the co-driver to assist him with piloting the train backwards to within 50 or 60 m of the separated section of the train.

ANALYSIS

On 22 April 2008, investigators from the Australian Transport Safety Bureau (ATSB) were dispatched to investigate the derailment site near Manton Dam.. Investigators were advised that the front section of the train (30 wagons) had departed the derailment site and was travelling south towards Katherine. The remaining damaged and derailed wagons, rolling stock components and damaged track were examined and photographed on site.

The derailment site was located on a straight section of track with a slight rising grade. Damaged components from railed and derailed wagons were spread along the track corridor for approximately 350 m.

Within the separated rear portion of the train (14 wagons) the second, third, eighth and thirteenth wagons had derailed. All wagon underside components suffered moderate to significant damage, including brake rigging, hopper doors, bogies and wheel flanges.

Inspection of rolling stock indicated that the failure of the coupler on the 31st wagon, CHQY 739C, was the likely initiator of the derailment.

Limited locomotive data was available for analysis by investigators as the train had departed the derailment site before all data had been correctly isolated and preserved. Information normally collected includes time of day, train speed, air brake pressures, vigilance acknowledgments, horn activation and headlights. The second locomotive (CLF6) provided an abbreviated source of data for analysis. No data was available from the lead locomotive ALF19 (corrupt) or the third locomotive VL352 (overwritten).

Based on the available evidence the investigation established that:

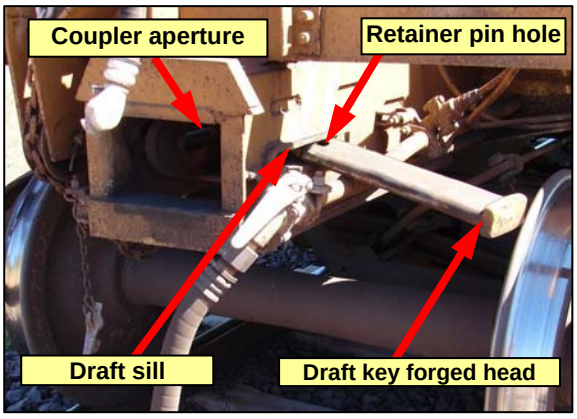
- There were no defects or deficiencies with the track that would have contributed to the train parting.
- Train speed was not considered to be a factor in the derailment even though the train was travelling at about 100 km/h; 5 km/h above the maximum track speed at the time of the derailment[4].
- The train drivers were appropriately trained, qualified and medically fit at the time of the derailment. In addition, fatigue was not considered to be a factor.
- The train driver responded appropriately to the loss of brake pipe air pressure by stretching the train, thereby decreasing the risk of any rear-end collision by the detached wagons.
- Damaged and displaced components from wagons trailing CHQY 739C, such as hopper doors, coupler release rods and a brake beam, were considered consequential and not contributory to the derailment.

The balance of this report focuses on analysing the factors that contributed to the failure of the coupler on wagon CHQY 739C.

Examination of wagon CHQY 739C

Wagon CHQY 739C was the 31st wagon in the train consist and was coupled immediately ahead of the first derailed wagon, CHQY 721Y. The coupler on the leading end of CHQY 739C had been pulled out of the headstock and had fallen between the rails. The draft key had almost completely withdrawn from the draft sill area and was found resting over the train brake pipe and against the wheel flange (Figure 3).

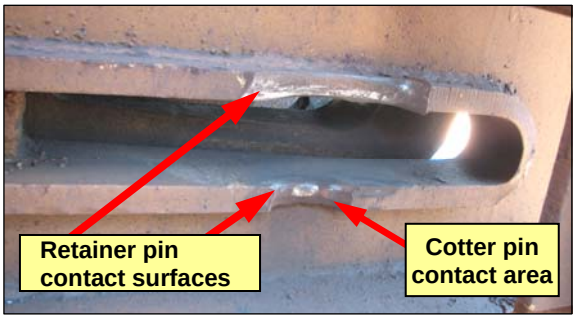
Figure 3: Disengaged draft key on wagon CHQY 739C (as found).



The draft key was the type which had a forged head at one end and a drilled hole that accepts a 'T' shaped retainer pin in the other end. It was evident that the retainer pin had dislodged which had allowed the draft key to work its way out of the draft sill. No parts from the retainer pin assembly were found during a search of the derailment site, precluding further examination or analysis of those components.

The lips on the draft sill on wagon CHQY 739C showed severe hollowing as a result of regular hard contact with the draft key retainer pin assembly (Figure 4).

Figure 4: Retainer pin contact wear areas on draft sill lips on wagon CHQY 739C.



Conversely, the draft sill lips on the other side of the underframe showed no signs of regular contact with the forged head end of the dislodged draft key. This indicates that the load on the draft key was biased in a way which increased the contact between the retainer pin assembly and the adjacent draft sill lips.

Other CHQY and CHSY wagons making up train 3DM4, used various combinations of coupler draft key retainer pin assemblies including forged 'T'

4 In undulating terrain, 5km/h is not considered excessive over speed as it is difficult for a train driver to accurately maintain precise speeds on short heavy trains.

pins with and without anti-wear collars (Figure 5 and Figure 6). Azee[5] drop-forged retainers, with and without the keeper, were also found on various wagons. It is of note that negligible retainer pin contact wear was evident on the draft sill lips where anti-wear collars had been fitted over the ends of the draft keys.

Figure 5: 'Azee' draft key retainer with keeper, anti-wear collar & cotter pin (correctly installed on another wagon in the consist)

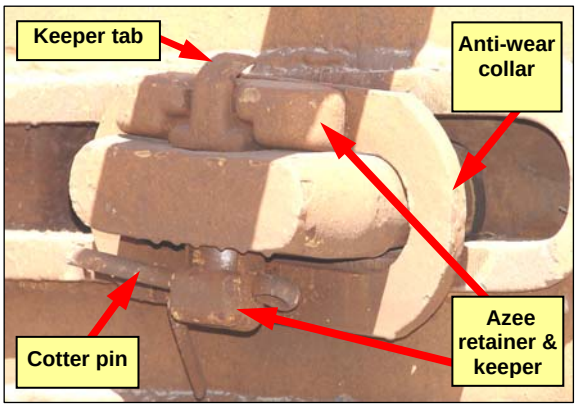
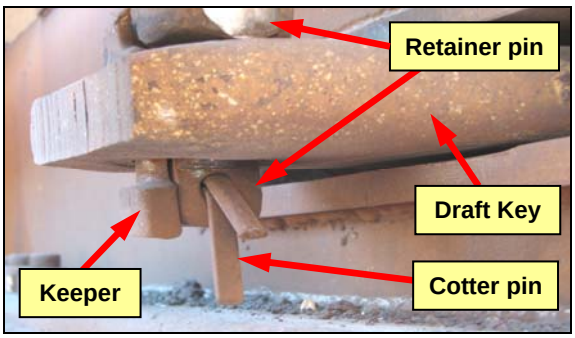


Figure 6: Detail assembly of draft key with Azee key retainer, keeper and cotter pin.



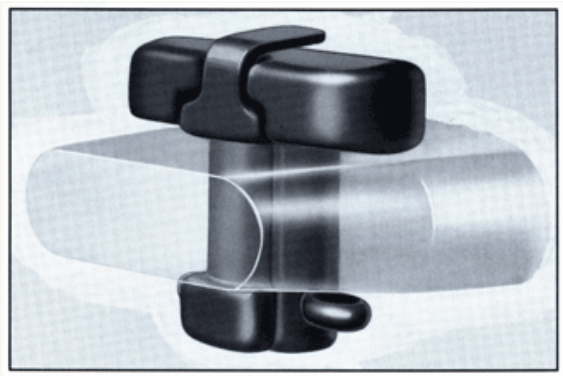
It is likely the failure sequence began when the cotter pin failed or dropped out of the base of the 'T' shaped draft key retainer pin. The wear marks on the lower draft sill lip (Figure 4) indicated that the cotter pin had probably worn away over a period of time by periodic hard contact with the face of the sill lip.

The wear marks on the draft sill lip also indicated that the retainer pin was probably a loose fit in the end of the draft key. The retainer pin was probably an Azee key that had been incompletely assembled without a keeper, just a cotter pin. Without a keeper, the retainer pin would have had excessive clearance within the draft key hole, allowing a greater opportunity for the cotter pin to come into contact with the lower draft sill lip. In five locations on four vehicles of the derailed train, it was observed that Azee retainer pins were incomplete and did not have the keeper installed.

When assembled correctly, the two functions of the Azee key keeper are to key the retainer pin and keeper together and lock the assembled retainer and keeper in the draft key hole as a unit. This means that even if the cotter pin fails and is lost from the Azee key assembly, the Azee key will remain intact as a unit and not work up and out of the draft key hole.

Subject matter published by Ireco LLC, the manufacturer of the Azee draft key retainer assembly, states that the keeper 'bendable tab can be straightened and reused several times.' When assembled, the flat keeper tab folds over the top of 'T' shaped retainer pin. The Azee key manufacturer states that the cotter pin is an A.A.R[6] requirement, but it is not required to keep the device within the draft key (Figure 6).

Figure 7: 'Azee' drop forged draft key retainer and keeper assembly



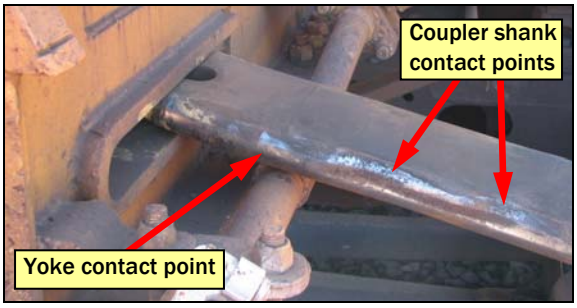
After the retainer pin had fallen out of the draft key hole, the draft key was no longer restrained and with the assistance of the longitudinal train forces, it worked laterally out of the draft sill, through the yoke and coupler shank, thereby allowing the coupler to be pulled out of the draft pocket.

5 A product of Ireco LLC – a company originally founded as Illinois Railway Equipment Co.

6 Association of American Railroads.

Although the function of the draft key is to secure the yoke and coupler as a unit within the underframe, it is designed to float freely within the confines of the draft sill aperture. Wear marks and polishing on the leading and trailing edges of the dislodged draft key Figure 8) showed friction contact points where the coupler shank had gripped the draft key during the compression and tension phases of the train's movement.

Figure 8: Draft key showing uneven contact wear



The unevenness of wear marks is further evidence suggesting that the forces on the draft key were biased on the retainer pin side, subjecting the cotter and retainer pins to abnormal wear as they were in more frequent hard contact with the draft sill lips. Had an anti-wear collar been fitted over the retainer pin end, contact wear would have been distributed over a larger area and the life of the cotter pin would have been extended. However, without appropriate maintenance it would have eventually failed. It is likely that misalignment and wear in the draft key slots within the yoke and/or the coupler shank had led to the biased forces on the draft key under operating conditions.

No documented failures of Azee key retainer pins have been found in the United States or Canada and research suggests those components are reliable when installed and maintained in accordance with the manufacturer's specifications.

Maintenance history of wagon CHQY 739C

CFCLA's and GWA's Northern Territory wagon and locomotive fleet is maintained by Downer EDI Rail (EDI) at their Berrimah maintenance facility.

Periodic wagon examinations for the CHQY and CHSY mining vehicle fleet are set at 12 month intervals. The maintenance procedures specify detailed inspections and servicing of brake equipment, draw gear, structure, bogies, axles and bearings. Intermediate six monthly services are carried out on the hopper discharge doors and associated hydraulic and air equipment. Service intervals are in accordance with standard railway practice for this type of vehicle.

EDI service records showed that when wagon CHQY 739C entered service in 2006 on the OM (Manganese) Ltd manganese ore project, routine maintenance had been carried out in accordance with approved CFCLA service schedules. Each service specifically included an inspection of the 'draft pin/key' and 'draft slots' for both the 'A' & 'B' ends of the wagon and no defects were identified with any draw gear components. CFCLA Wagon Exam forms completed for CHQY 739C on 22 August 2006 and 31 July 2007 had the draft key inspection result boxes marked by the maintenance fitter with a 'P' (passed inspection) and no additional notes had been made in relation to draft key component repairs. The Wagon Exam form also recorded the next workshop maintenance inspection as August 2008.

Several wagons on the train had incorrectly installed Azee draft key retainers (without keepers), and it is likely that the failed coupler on wagon CHQY 739C also had an incorrectly installed retainer pin assembly. This is indicative that past maintenance on the wagon couplers was deficient as the previous inspections had not noted or rectified the incorrectly installed retainer pin assemblies. The maintenance service in July 2007, 10 months before the derailment, was the last recorded inspection of the coupler and it is likely that the draft key retainer components would have been showing some signs of deterioration at this time.

In addition, roll-by examinations[7] by EDI for the arrival of the loaded train into the Berrimah Rail Terminal did not identify any draft key/pin defects. Similarly, roll-by examinations on the empty train prior to departure from Berrimah did not find any defects with draw gear components when they

7 A visual inspection of a moving train to identify equipment, loading security or other defects or failure. The extent of the defects detected will be dependent on the speed of the train during the roll-by examination.

were checked by Pacific National and GWA train examiners.

Typically, defects identified in the past on CHQY and CHSY series wagons during loaded train inspections included ore discharge doors not completely closing, build up of wheel scale and defective or worn brake blocks.

All defects found during arrival and departure train inspections are recorded on the EDI 'Wagon Inspection Sheet'. Information recorded on this sheet is entered into the EDI maintenance system for individual wagon history management and hardcopies are forwarded to FreightLink, CFCLA and Pacific National. Pacific National also records this information in their Train Management System.

CFCLA forms for Wagon Exam, CHQY & CHSY, 6-Monthly Inspection, 'Wheel Inspection and Single Car Air Test' are entered into the EDI maintenance system and copies are forwarded to CFCLA to track wagon maintenance histories.

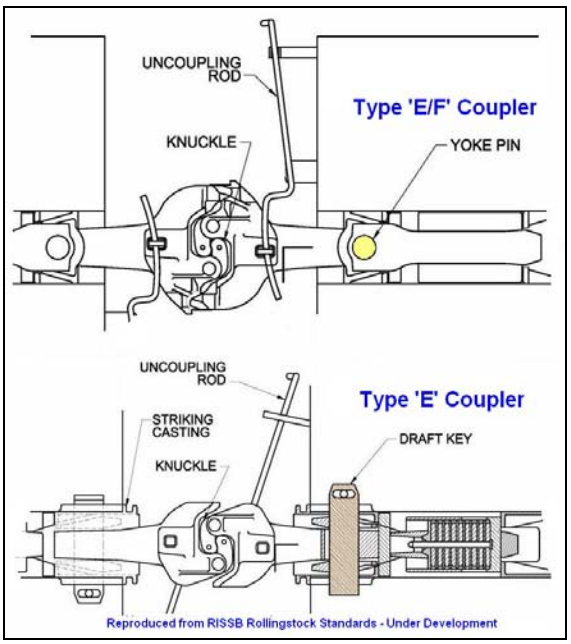
Following the derailment, ATSB investigators found seven defective draft key components on the last 13 wagons in train 3DM4. None of those defects were recorded in the train inspection and service records for the wagons and in most cases the draft key and retainer pin defects and draft sill lip wear would have been clearly evident during wagon inspection and servicing. This indicates that the inspection and maintenance of those wagons had been deficient with respect to the draft components. This factor directly contributed to the derailment.

History of similar incidents

Previous train partings and derailments in NSW and Victoria involving CQBY[8] wagons have occurred as a result of the failure of draft key components. In several previous occurrences the draft key has become dislodged and allowed the coupler to withdraw from the draft pocket. CFCLA, the wagon owner, has carried out various modifications to CQBY wagons fitted with draft keys but the modifications have not led to sustained reliability. The type 'E' couplers used on the CQBY wagons use a horizontal draft key assembly similar to the couplers on CHQY and CHSY wagons on train 3DM4.

On 12 September 2006, a derailment occurred near Seymour, Vic., as a result of the failure of a coupler on a CFCLA CQBY wagon. The derailment was investigated by the ATSB[9] and was very similar to the derailment near Manton Dam on 22 April 2008. The ATSB's investigation report highlighted safety issues with CQBY wagons manufactured in China that were shipped with draft key and retainer pin coupler (Type 'E') assemblies. Subsequent CQBY wagons have been manufactured with vertical pin type 'E/F' couplers that eliminate the use of draft keys (Figure 9). The Australian Code of Practice for rolling stock recommends Type E/F coupler assemblies as standard fitment.

Figure 9: Comparison of coupler assemblies - Type E/F (top) and Type E draft key (bottom)



Previous safety action taken

CLFCA have been aware of problems with the type E couplers for a number of years. They have issued periodic advice to their wagon maintenance service providers starting with Maintenance Improvement Circular 09/04, in

8 The CQBY is a flat skeletal wagon designed for transporting containerised freight.

9 ATSB Rail Occurrence Investigation 2006/007 Derailment of Train 2CM3 near Seymour, Victoria 12 September 2006 *http://www.atsb.gov.au/publications/investigation_reports/2006/RAIR/rair2006007.aspx*

2004, regarding the shortcomings of the Type E couplers. In addition, Maintenance Improvement Circular 17/06, issued in 2006, was also distributed by CFCLA so all CQBY series wagons could be inspected, repaired on the spot or red carded[10] if the draft key retainer pins were found to be severely worn or missing. A further Maintenance Improvement Circular 21/07 was issued in 2007 specifying a modification to install Azee drop-forged draft key retainer pins.

In addition, other safety bulletins and notices have been published by FreightLink and the NSW, Independent Transport Safety and Reliability Regulator (ITSRR) about draft key coupling failures on wagons. FreightLink issued safety alert (FL-SA-01-004) immediately following the derailment and ITSRR republished this document as:

> Rail Industry Safety Notice - RISN No 21 - Retainer Pin Assembly – CHQY, CHSY, FPPY & FQCY Wagon Couplers.

The ITSRR safety notice draws the attention of NSW operators and rolling stock maintainers to FreightLink safety alert (FL-SA-01-004) and to review, assess and manage the risks associated with draft keys and retainer pins for those classes of wagons.

The Transport Advisory Weekly (22 February 2008) item titled 'Coupling failure caused derailment' describes the ATSB investigation of the train derailment near Seymour (Vic.) on 12 September 2006. It also advised that there had been a number of similar failures of this type of coupler in the past.

During the ATSB's investigation of the derailment near Seymour, CFCLA advised that, in the short term, they were addressing the safety issues by converting all the CFCLA fleet of CQBY wagons still fitted with old style draft key retainer pins to the Azee type draft key retainers. In response to this safety action, the ATSB's final report on the derailment recommended that CFCLA take action to address the following safety issue:

> Where 'Azee' draft key retainer pins have been fitted to CQBY wagons maintenance programs should be reviewed to ensure existing or revised inspection intervals are appropriate for these items.

On 25 April 2008, (three days after the derailment at Manton Dam), CFCLA further advised the ATSB that:

> ...existing inspection instructions are being amended for Azee draft key retainer pins and details of these changes will be posted on CFCLA's website for accessing by CFCLA maintenance contractors and operators.

With such a lengthy history of draft key retainer pin failures on CQBY wagons, it is evident that CFCLA did not initiate a timely inspection (or rectification) program to validate the integrity of the CHQY and CHSY classes of wagons using the same type of couplers. It is probable that, had such a program been implemented, the failure of coupler components and subsequent derailment at Manton Dam would have been prevented.

Before the derailment of train 3DM4 near Manton Dam, EDI maintenance personnel at Berrimah, NT were unaware of previous draft key retainer pin issues on CQBY or other types of draft keyed wagons in the CFCLA fleet.

As the owner and lessor of rolling stock and locomotives to the Australian rail industry, CFCLA had first-hand knowledge of all its wagons fitted with draft key coupling equipment. Given the 4 year history of multiple failures of draft key retainer pins in their fleet, it would have been prudent for CFCLA to examine all remaining wagons fitted with draft keys to establish the integrity of those components, and to immediately implement a program to complete any outstanding maintenance or associated equipment upgrades.

Preservation of evidence

Contrary to instructions issued by ATSB safety investigators under the *Transport Safety Investigation Act 2003* on the day of the derailment, electronic data log information from two locomotives on train 3DM4 was not isolated and correctly preserved for analysis. Assurances provided by EDI maintenance personnel to ATSB investigators that this information had been correctly downloaded and verified, led to the release of the front portion of the train to the operator (FreightLink) to continue its southward

10 Red carding is a process used to identify an item of rolling stock with a defect that prevents the vehicle from operating on the network until repaired.

journey. Although not critical in this instance, the loss of this information in other circumstances (such as a level crossing collision or safe-working breach) would greatly hinder investigators and train operators in establishing and analysing the sequence of events.

On 3 March 2008, CFCLA issued a Risk Mitigation Action Plan (RMAP) for Locomotive Data loggers. The RMAP was developed as a result of an investigation into the level crossing collision at Grawlin Plains NSW on 31 May 2005[11] and a directive by the ITSSR to ensure that:

- data-log recording devices are serviced and maintained in good working order;
- data-log equipment is regularly tested by operators and any faults are reported to the CFCLA Help Desk;
- adequate spare data-log units are available to replace defective units;
- technical staff are trained in the servicing and extraction of data; and
- audits are conducted on CFCLA contract maintainers to ensure compliance with prescribed maintenance requirements.

Supporting documentation to the RMAP provides details for the servicing and maintenance of Hasler and Wabtec brands of data log equipment but does not include Fischer Industries memory modules. CFCLA locomotive VL 352 was fitted with a Wabtec data logger and GWA locomotives ALF19 and CLF6 were fitted with Fischer Industries memory modules. All three types of data loggers are installed and serviced by EDI.

Before train 3DM4 derailed, Berrimah maintenance staff had not been briefed or trained on the RMAP requirements and supporting documentation for all types of data-log equipment. With the exception of routine maintenance practices for handling and extracting data from locomotives, there was limited local operator and maintenance employee knowledge about the ATSB legislative requirements to comply with the Protection Order issued by investigators for the preservation of locomotive data-log information.

11 Office of Transport Safety Investigations (NSW) - Rail Safety Investigation Report – Fatal Level Crossing Collision at Grawlin Plains 31 May 2005.

FINDINGS

Context

At approximately 0542 on 22 April 2008, empty manganese ore train 3DM4 derailed four wagons approximately 58 km south of Darwin,NT after the coupler was pulled out of the 31st wagon. There were no injuries as a result of the derailment. There was however, moderate to significant damage to 14 wagons and minor damage to the track.

Based on the available evidence, the following findings are made with respect to the derailment but should not be read as apportioning blame or liability to any particular individual or organisation.

Contributing Safety Factors

- Excessive biased forces were transmitted through the coupler to the draft key and retainer pin assembly of wagon CHQY 739C. This resulted in abnormal wear on the draft key retainer pin assembly which eventually led to the failure of the cotter pin. The retainer pin then became dislodged which in turn allowed the draft key to slide out of the draft sill which resulted in the coupler pulling out of the wagon.
- The dislodged coupler then fell between the rails and led to the derailment and damage to four wagons following wagon CHQY 739C.
- It is likely that the retainer pin assembly which failed on wagon CHQY 739C was an Azee type which had not been correctly fitted. The condition of the draft key retainer pins on a number of wagon couplers on train 3D4M and the failure of the coupler on wagon CHQY 739C, indicates that previous maintenance on the wagon draw gear was deficient.
- Following a succession of similar coupler failures, CFCLA failed to implement an effective inspection and maintenance program to ensure all classes of wagons fitted with draft keys were modified and maintained in a fit for purpose condition. *[Safety issue]*

Other safety factors

- There were no mechanical deficiencies with the locomotives. However locomotive data log information was not isolated or correctly preserved and as a result the data was

corrupted or overwritten. This issue occurred as a result of inadequate training of maintenance personnel in the servicing and extraction of data from data logging devices installed on CFCLA's and GWA's locomotive fleet. *[Safety Issue]*

SAFETY ACTION

The safety issues identified during this investigation are listed in the Findings and Safety Actions sections of this report. The Australian Transport Safety Bureau (ATSB) expects that all safety issues identified by the investigation should be addressed by the relevant organisation(s). In addressing those issues, the ATSB prefers to encourage relevant organisation(s) to proactively initiate safety action, rather than to issue formal safety recommendations or safety advisory notices.

All of the responsible organisations for the safety issues identified during this investigation were given a draft report and invited to provide submissions. As part of that process, each organisation was asked to communicate what safety actions, if any, they had carried out or were planning to carry out in relation to each safety issue relevant to their organisation.

FreightLink Pty Ltd

Action taken by FreightLink Pty Ltd

On 28 April 2008 FreightLink issued Work Instruction FL-WI-03-026 for the attention of all wagon maintenance and train inspection staff. The work instruction titled *Murray Key Retainer Pin Inspection Instruction* applies to the CHQY, CHSY, FQCY and FPPY wagon series.

Chicago Freight Car Leasing Australia Pty Ltd

Inspection and maintenance of all draft keyed wagons

Safety Issue

Following a succession of similar coupler failures, CFCLA failed to implement an effective inspection and maintenance program to ensure all classes of wagons fitted with draft keys were modified and maintained in a fit for purpose condition.

Action taken by Chicago Freight Car Leasing Australia Pty Ltd

On 1 May 2008, CFCLA issued *Maintenance Improvement Circular 23/08* providing advice to all CFCLA operators and maintainers:

> ...to ensure that all wagons fitted with Murray key draft equipment have the retaining pin assembly and associated components inspected, verified or remediated to ensure that the Murray keys will not dislodge whilst in service.

This circular is applicable for all CFCLA owned CHQY, CHRY, CHSY and CHTY ore hoppers and CQBY container flat wagons.

CFCLA also advised the ATSB that:

> CFCLA is in the process of changing out the Murray key to vertical pin design on the CHSY and all CQBY wagons.....All CQBY Mark 4 wagons are fitted with vertical pin at original delivery. To date 7 out of 120 CQBY (Marks 1 & 2) wagons have been modified to vertical pin.
>
> The CHQY and CHTY wagons will continue to have the Murray key assembly due to these wagons being deployed to less arduous duties.

Work to replace couplers on the CQBY wagon fleet commenced in June 2008 and is scheduled for completion by the end of 2010.

Locomotive data log information preservation

Safety Issue

There were no mechanical deficiencies with the locomotives. However locomotive data log information was not isolated or correctly preserved and as a result the data was corrupted or overwritten. This issue occurred as a result of inadequate training of maintenance personnel in the servicing and extraction of data from data logging devices installed on CFCLA's and GWA's locomotive fleet.

Action taken by Chicago Freight Car Leasing Australia Pty Ltd

CFCLA are currently taking action to address this safety issue by:

> Negotiating with Wabtec to increase the data logger memory capacity in order to reduce the likelihood of logger data being overwritten prior to the required data being downloaded.

Commence a data logger training program to be conducted by Wabtec for CFCLA maintenance staff and contractors to improve competency in maintaining and downloading data loggers.

Roll out RMAP (CFCLA-PLN-RSLK-002) to cover the contractors who are charged with the responsibility for data logger maintenance and downloading.

CFCLA and GWA will enhance the Safety Interface Agreement to ensure that issues associated with preservation of data in the data logger following and occurrence will be addressed.

Genesee & Wyoming Australia

Locomotive data log information preservation

Safety Issue

There were no mechanical deficiencies with the locomotives. However locomotive data log information was not isolated or correctly preserved and as a result the data was corrupted or overwritten. This issue occurred as a result of inadequate training of maintenance personnel in the servicing and extraction of data from data logging devices installed on CFCLA's and GWA's locomotive fleet.

ATSB safety recommendation RR2008-006-SR-007

The Australian Transport Safety Bureau recommends that Genesee & Wyoming Australia take action to address this safety issue.

SOURCES AND SUBMISSIONS

Sources of information

- Freight Link
- Chicago Freight Car Leasing Australia (CFCLA), GWA
- Northern Territory Rail Safety Regulator.

References

ATSB Rail Occurrence Investigation Report No. 2006/007.

Code Management Company - Glossary for the National Codes of Practice - January 2003.

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the Transport Safety Investigation Act 2003, the Executive Director may provide a draft report, on a confidential basis, to any person whom the Executive Director considers appropriate. Section 26 (1) (a) of the Act allows a person receiving a draft report to make submissions to the Executive Director about the draft report.

A draft of this report was provided to:

- The Northern Territory Department of Planning and Infrastructure, Transport Safety Division, Rail Safety Unit.
- The New South Wales Independent Transport Safety and Reliability Regulator.
- Chicago Freight Car Leasing Australia Pty Ltd.
- Downer EDI Rail.
- Genesee & Wyoming Australia.
- Two train drivers.
- FreightLink Pty Ltd.

Submissions to the draft report were received from:

- Chicago Freight Car Leasing Australia Pty Ltd.
- FreightLink Pty Ltd.
- The New South Wales Independent Transport Safety and Reliability Regulator.
- One train driver