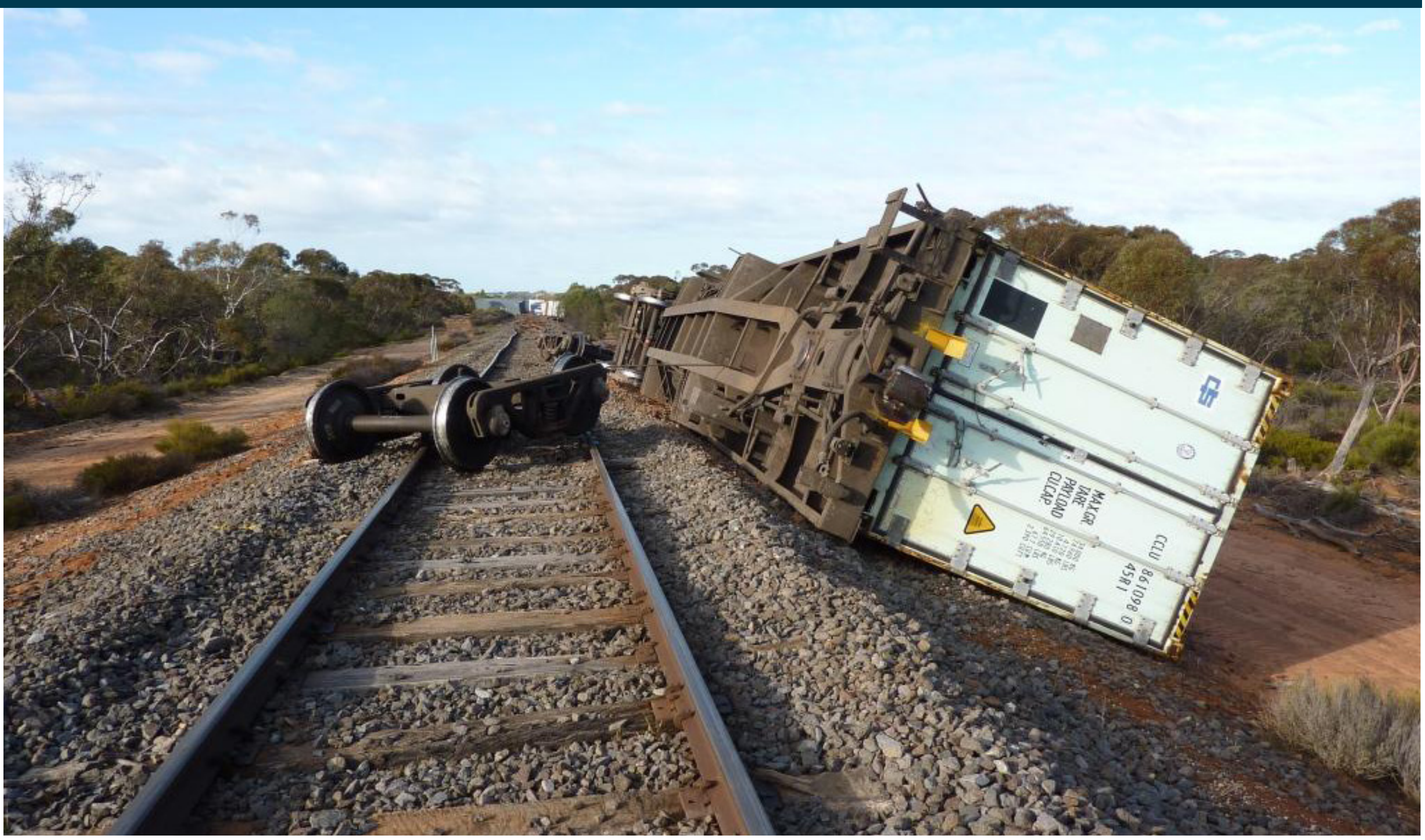
Australian Government
Australian Transport Safety Bureau

Derailment of freight train 9101

24 km south of Ouyen, Victoria | 10 August 2013



Investigation

ATSB Transport Safety Report
Rail Occurrence Investigation
RO-2013-021
Final – 1 August 2014

This investigation was conducted under the *Transport Safety Investigation Act 2003* by the Chief Investigator, Transport Safety (Victoria) on behalf of the Australian Transport Safety Bureau in accordance with the Collaboration Agreement entered into on 18 January 2013.

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

Cover photo: Chief Investigator, Transport Safety (Victoria)

Publishing information

Published by: Australian Transport Safety Bureau
Postal address: PO Box 967, Civic Square ACT 2608
Office: 62 Northbourne Avenue Canberra, Australian Capital Territory 2601
Telephone: 1800 020 616, from overseas +61 2 6257 4150 (24 hours)
Accident and incident notification: 1800 011 034 (24 hours)
Facsimile: 02 6247 3117, from overseas +61 2 6247 3117
Email: atsbinfo@atsb.gov.au
Internet: www.atsb.gov.au

Addendum

Page	Change	Date

Safety summary

What happened

At about 0834 on 10 August 2013, freight train 9101 derailed at a failed mechanical rail joint between Tempy and Bronzewing in Victoria. Nine wagons located mid-consist derailed and separated from the consist with three wagons ending on their side. The two locomotives and the leading 21 wagons and the last 10 wagons remained on the track. Approximately 300 m of track was destroyed as a result of the derailment. There were no injuries to train crew in the incident.

What the ATSB found

The ATSB found that the mechanical rail joint failed due to the development of fatigue cracks in both fishplates resulting in their subsequent overload fracture. The fatigue cracks had originated in the top surface of each fishplate and it is possible that differential sleeper support may have contributed to higher than normal cyclic tensile stress in the fishplates. Lower than required fishbolt torque was also identified and it is possible that movement within the joint may also have contributed to the development of the fatigue cracks, and the subsequent joint failure.

The fatigue cracks had developed over a period of time and the overload fractures had occurred prior to train 9101. Movement of the separated rail ends during the passage of train 9101 resulted in a lateral discontinuity in the running rail at the joint and the train’s derailment.

The ATSB found that the degraded and deteriorating condition of the rail joint was not detected by V/Line’s track inspections. In the 27 months preceding the derailment, visual inspections of this section of track had been conducted solely from rail vehicles and track walking inspections had not been conducted at intervals specified by maintenance procedures.

What's been done as a result

V/Line has updated its maintenance system to generate automated work orders for track walking inspections. In order to improve the detection of track defects, maintenance staff have been provided with specific inspection criteria for track infrastructure including joints and fastenings in their work orders.

Safety message

The implementation of effective inspection and maintenance regimes for the early detection and management of track defects is critical to the safety of rail operations.

Contents

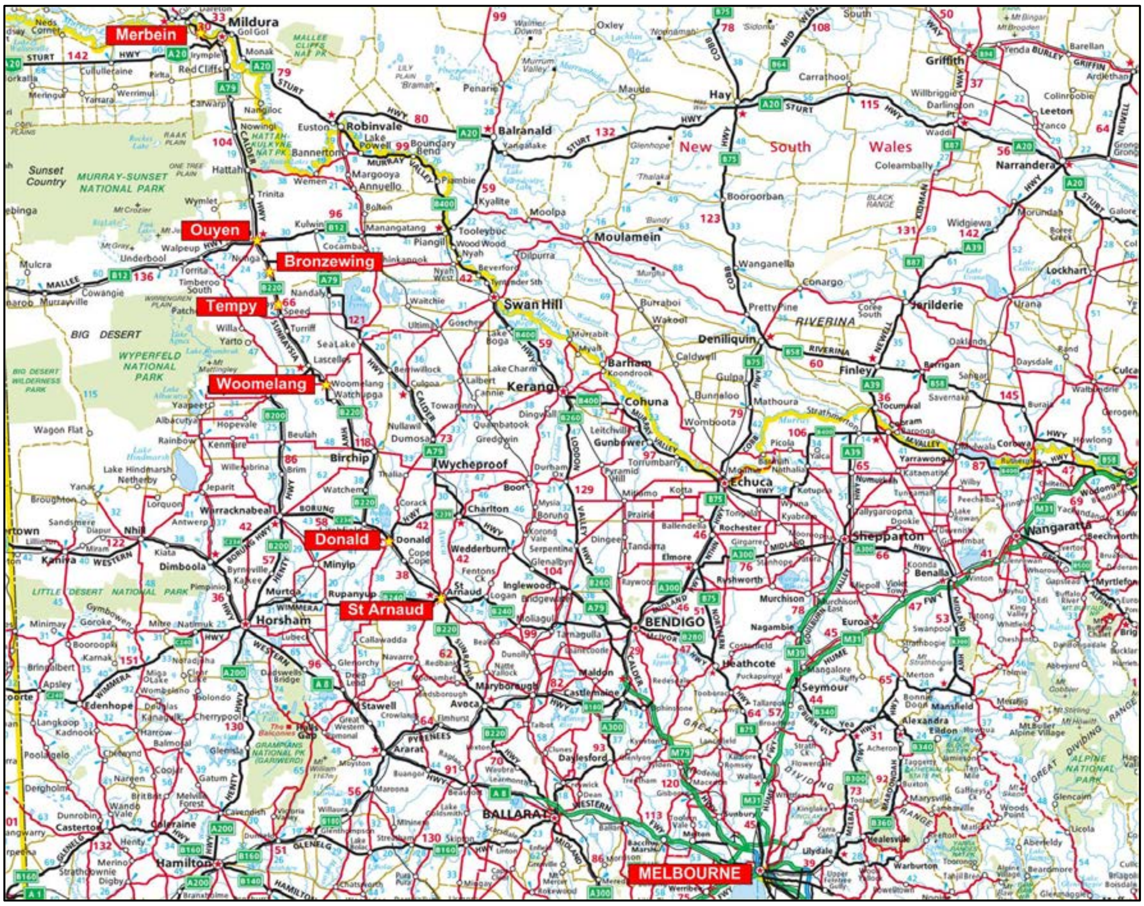
The occurrence 1
Train journey 1
Damage 2
Context 4
Location 4
Train and crew information 4
Rail joints 5
Failure of mechanical rail joints 5
Examination of joints 6
Track maintenance and defects 7
Safety analysis 9
Derailment 9
Rail joint failure mechanism 9
Track maintenance 9
Findings 10
Contributing factors 10
Other factors that increased risk 10
Safety issues and actions 11
Degraded rail joint was not detected 11
Safety issue description: 11
Track inspections frequency 12
Safety issue description: 12
General details 13
Occurrence details 13
Train details 13
Sources and submissions 14
Sources of information 14
References 14
Submissions 14
Australian Transport Safety Bureau 15
Purpose of safety investigations 15
Developing safety action 15

The occurrence

Train journey

At about 2350[1] on 9 August 2013, Pacific National freight train 9101 departed Appleton Dock, Melbourne bound for Merbein in northwest Victoria (Figure 1). The train was operated on the V/Line broad gauge network by a crew of two and consisted of two locomotives hauling 54 wagons.

Figure 1: Route of freight train 9101



Source: Copyright Melway Publishing 2013 with annotations by Chief Investigator, Transport Safety (Victoria)

The train arrived at Donald at about 0525 on 10 August 2013, where 14 wagons were detached from the consist leaving it with a total mass of 1409 t and a length of 866.2 m. Shortly after, at about 0555, the train departed Donald. The train arrived at Woomelang at about 0725 and departed at 0738 after a crew change.

The train crew reported hearing a 'bang' and feeling a 'bump' at about 0834, approaching the 486 km post between Tempy and Bronzewing. Shortly after, an emergency brake application occurred due to a loss of brake pipe pressure. In response to this, the driver released the locomotive independent brake[2] and continued powering to maintain the train couplings in a draft condition[3]. The train subsequently came to a stand with the lead locomotive at about the 486.5 km post. At the time of this occurrence the train was travelling below the line speed for the track (80 km/h) and train handling did not contribute to the derailment.

---

[1] The 24-hour clock is used in this report and is referenced from Eastern Standard Time (EST), UTC +10 hours.

[2] An air brake system that operates on the locomotive independent of the train air brake system.

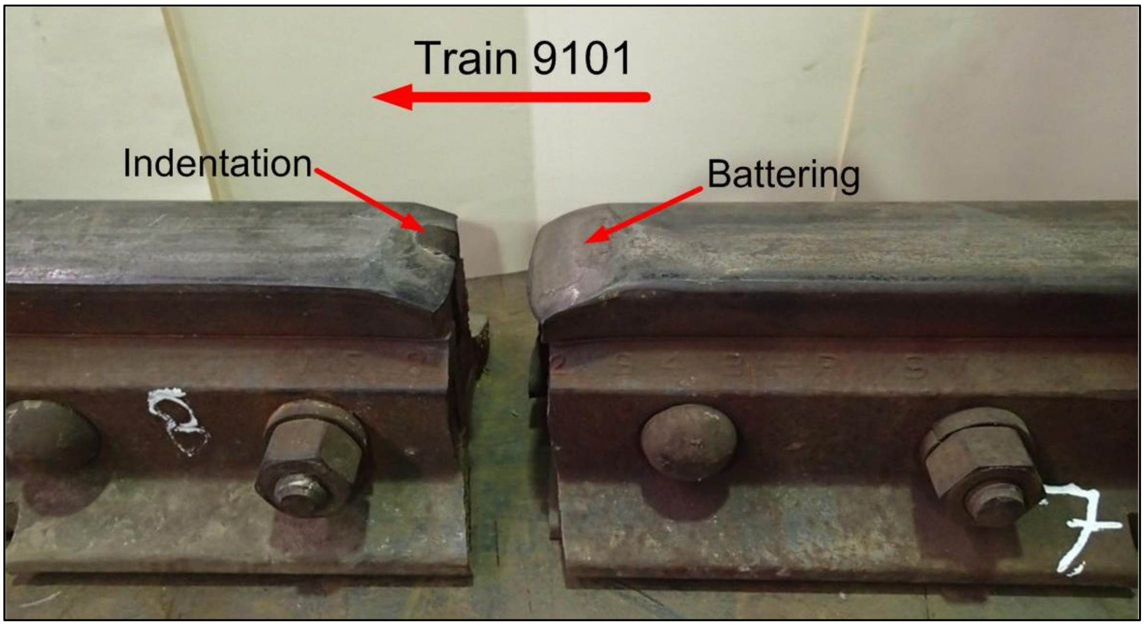
[3] A condition that maintains the coupler forces throughout the train in tension.

Once the train had stopped, a crew member investigated the cause of the brake application. On observing the derailed wagons, the crew secured the train and advised Central[4] that train 9101 had derailed. There were no injuries to the public or the train crew.

The derailment

The train derailed due to the failure of a mechanical rail joint on the west rail located at about the 485.3 km mark. The fishplates of the rail joint had fractured transversely at about mid-length. The running faces at both rail ends were battered and an indentation consistent with impact from a wheel flange was found on one rail head (Figure 2). The extent of the battering of both rail ends indicated that the fracture was present for some period of time, as trains had passed in both directions over the joint after both fishplates had fractured and allowed vertical misalignment at the joint.

Figure 2: Failed mechanical rail joint



Source: ALS Global with annotations by Chief Investigator, Transport Safety (Victoria)

The passage of train 9101 over the failed joint disturbed the joint sufficiently to laterally misalign the rails, such that a wheel of the trailing bogie of the 21st wagon impacted with the rail end, resulting in a disarranged rail and a loss of guidance for the following wagons. Impact and friction marks observed on the field side[5] trailing bogie wheels of the 21st wagon indicated that high lateral forces were experienced by this wagon prior to separation. The 22nd wagon and the following wagons veered to the west of the line causing the failure of the draw gear and separation from the leading section of the consist. The separation caused an emergency brake application. Nine wagons derailed, with the last 10 wagons separating and remaining on the rails south of the derailed wagons.

Damage

Of the nine wagons that derailed, the 22nd, 23rd and 24th wagons ended on their sides, the front-end of the 22nd wagon resting about 27 m from the upright 21st wagon (Figure 3).

The next six wagons that derailed stayed upright among the disarranged track about 127 m from the wagons on their sides (Figure 4).

---

[4] Central Control - The operational control centre for Victoria's regional rail network.

[5] The outer edge of the rail.

Figure 3: Leading section on rails and rolled wagons

Source: Chief Investigator, Transport Safety (Victoria)

Figure 4: Derailed but upright wagons and track damage

Source: Chief Investigator, Transport Safety (Victoria)

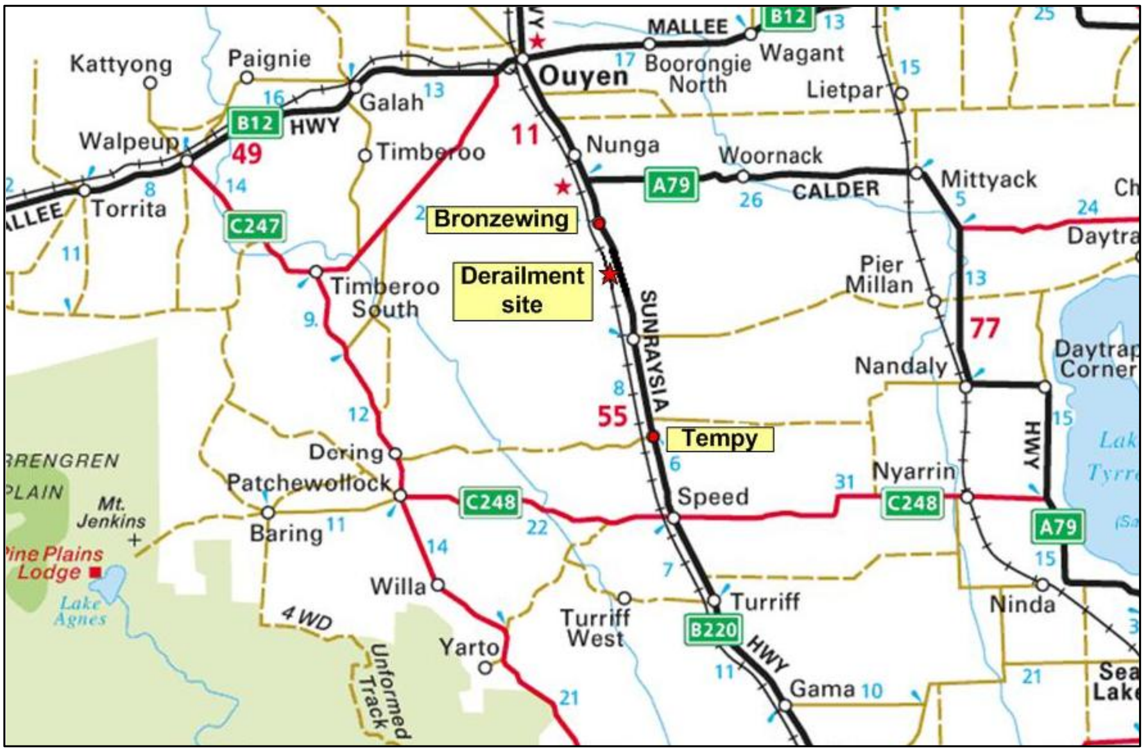
Approximately 300 m of track was destroyed. The line was out of service until 26 August 2013.

Context

Location

The derailment occurred between Tempy and Bronzewing (Figure 5) approximately 24 km south of Ouyen in an area designated as a national park.

Figure 5: Derailment site



Source: Copyright Melway Publishing 2013 with annotations by Chief Investigator, Transport Safety (Victoria)

The regional rail network is managed by V/Line Pty Ltd. This section was designated as Class 3[6] track (minor passenger line) for maintenance purposes, although it was being operated as a freight only line. The track between Tempy and Bronzewing was mostly straight and slightly undulating and in the derailment location track speed was limited to 80 km/h.

This was a single broad gauge, bi-directional track with rolling stock axle loads limited to 19 t. It was constructed of 47 kg/m rail, fastened to timber sleepers using dog spikes and double shoulder sleeper plates. There were no identified issues with the track support in the adjoining undisturbed track.

Train and crew information

Departing Donald, the Pacific National freight train 9101 consisted of two locomotives hauling 40 wagons. The train was marshalled with loaded wagons predominating towards the middle of the train and a mix of empty and partially loaded wagons towards the front and rear of the train. The axle loads for the wagons with the maximum load were within the maximum authorised axle loading limits for the track.

[6] Specifies the Nominal Operating and Infrastructure Parameters for Victorian railway track categorised as Minor Passenger Lines.

A post-derailment inspection of the wagons indicated that they were in serviceable condition before the derailment. The bogies and wheel sets of the derailed wagons were also inspected and no defects were identified that may have contributed to the derailment.

Train 9101 was crewed by two drivers who were appropriately qualified and certified for the route. The drivers were tested for the presence of alcohol after the derailment and returned zero results.

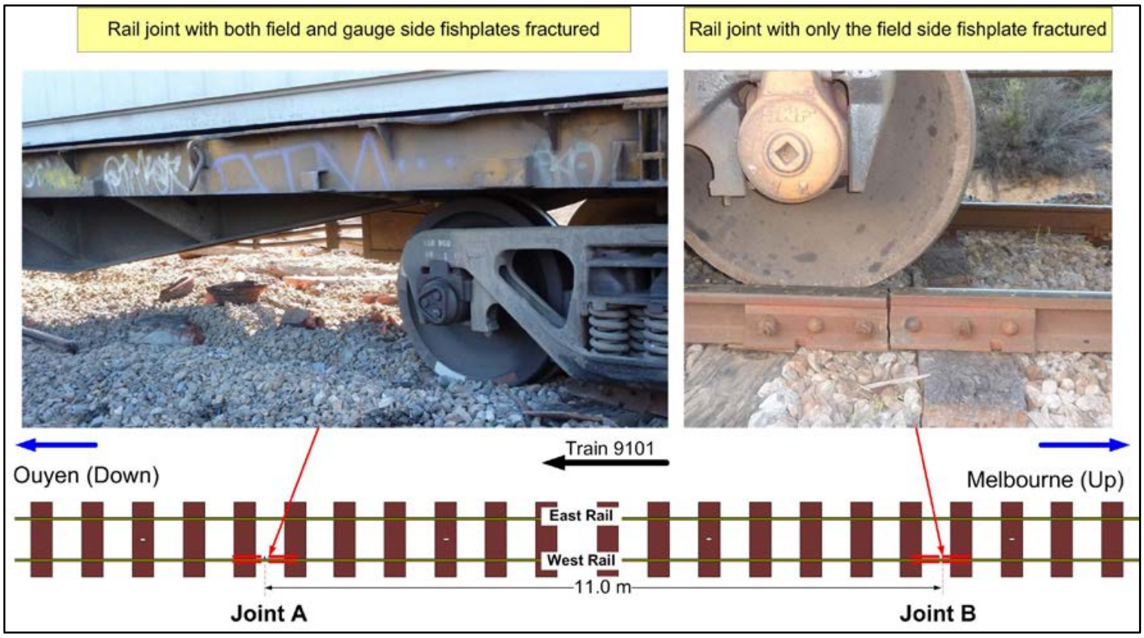
Rail joints

Fishplates—one either side of the rails—are used to mechanically attach lengths of rail and transmit bending moments and shear forces from one section of rail to the abutting section. A connection that is secured efficiently typically transmits about 90 per cent of the bending moment[7] and the loading is exerted evenly on the fishing surfaces[8] of the fishplate. The performance of the fishplate connection is dependent upon the tension applied to the connecting bolts (fishbolts) to achieve the desired clamp force.

Failure of mechanical rail joints

Two mechanical rail joints had failed in the west rail around the 485.3 km mark (Figure 6). One (joint A) failed completely and initiated the derailment. A second (joint B), that was located about 11 m before joint A, had a fractured fishplate on the field side, but the rail remained in place held by the intact gauge-side[9] fishplate. Due to track disturbance and gauge spread, the left wheels of the wagon at joint B dropped in (Figure 6).

Figure 6: Failed mechanical rail joints



Source: Chief Investigator, Transport Safety (Victoria)

The failed fishplates were subjected to visual and fractographic examination, chemical analysis, tensile testing and microstructural examination.

The material properties of all fishplates were found to be typical of that expected of carbon steel and this application and there were no identified material defects that might have contributed to the fishplate failures.

7 Cope. G.H, (1993), British Railway Track, Design, Construction and Maintenance, The Permanent Way Institution, Echo Press, Loughborough, Leics., England.

8 Fishing surface is the upper surface of the fishplate that the bottom face of the rail head rests/bears on.

9 The inner edge of the rail.

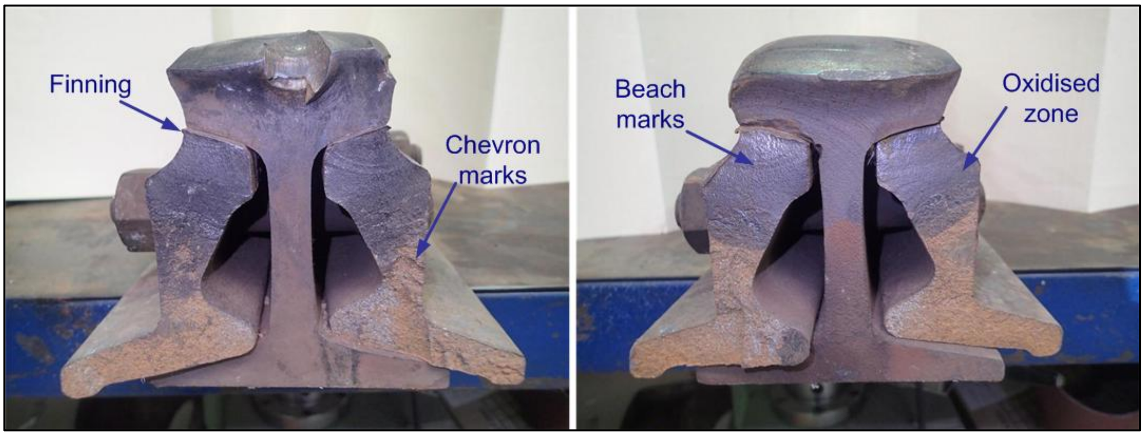
Examination of joints

Rail joint A

The fishplates at this joint were produced by BHP in 1969 (gauge side) & 1973 (field side). They were marked for 94 lb/yard[10] rail and were the appropriate size for joining this rail. The rail was measured and the rail section dimensions indicated that it was equivalent to a 94 lb/yard rail profile. The fishplates were of six bolt-hole type, although only five bolts had been securing the joint, with the outermost bolt on the Up-end missing. Markings on the bolts indicated that they were M24 size bolts. Bolt torque values for this joint ranged from 260 Nm to 400 Nm compared to the installation requirement of 450-500 Nm.

The breaks in both fishplates had occurred transversely at mid-length. The fishplate fractures exhibited discolouration of the top end of the surfaces, consistent with long term oxidation of the fracture surfaces (Figure 7). The oxidised zones of the fracture surfaces exhibited beach marks consistent with fatigue fracture. The orientation of the beach marks indicated that the fractures had originated at the top surfaces of the fishplates. The fatigue had progressed to a depth of about 40 mm from the top of the fishplates.

Figure 7: Fractographic observations of fishplates



Source: ALS Global – Annotated by Chief Investigator, Transport Safety

The spacing of the beach marks was consistent with a moderate stress, moderate cycle fatigue in the initial part of the fracture surface. As the fatigue crack progressed, the beach mark spacing became coarser indicating a change in progression to a high stress, low cycle fatigue mechanism. These fracture surfaces had been worn by contact and abrasion in service and details of the fracture mechanism in the vicinity of the top end of the fatigue fractures had been removed as a result.

The final fractures zones, below the oxidised surfaces, exhibited ridges and valleys consistent with chevron markings that are characteristic of instantaneous overload fracture.

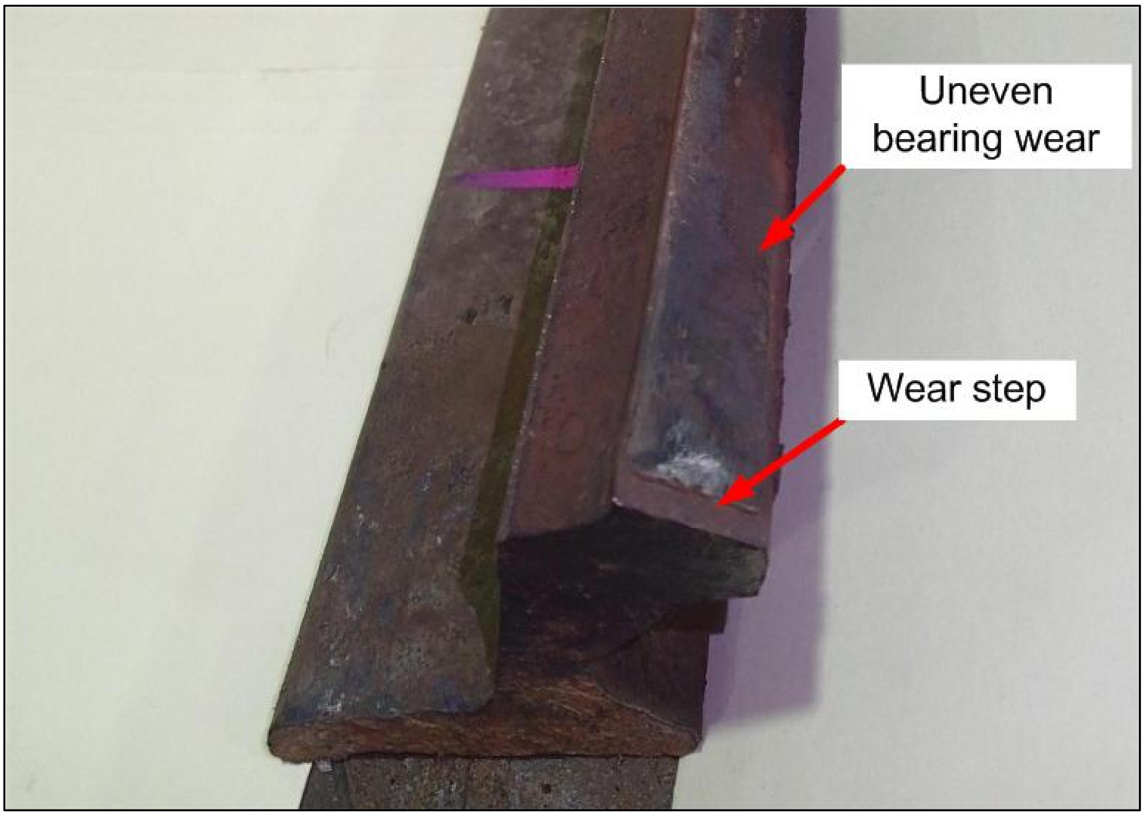
The top fishing surfaces of the fishplates exhibited finning[11] (Figure 7) and uneven bearing wear (Figure 8) that had culminated in wear steps at the joint gap adjacent to the fracture. Both wear features indicated that relative movement had occurred between the rail head and the fishing surface in service.

---

[10] Equivalent to 47 kg/m rail.

[11] Finning is the thin metal projection formed on the fishplates when the metal was forced outwards under pressure at the rail/fishplate interface.

Figure 8: Bearing wear and wear step on fishing surface of fishplate



Source: ALS Global

Rail joint B

The fishplates of this rail joint were also produced by BHP (1970) and were marked for 94 lb/yard rail. The adjacent rail was measured and the rail section dimensions indicated that it was equivalent to a 94 lb/yard rail profile. The field side fishplate in this joint had fractured but the gauge side fishplate was intact. There were six M24 fishplate bolts fitted to the joint, with measured bolt torques ranging from finger tight to 150 Nm.

Examination of the fractured fishplate indicated a juvenile fatigue fracture that had progressed to a depth of about 10 mm from the top of the fishplate. The remainder of the fishplate fracture was free from oxidation and exhibited chevron markings characteristic of instantaneous overload radiating from the juvenile fatigue crack at the top of the cross section through to the bottom of the fishplate. The final fracture zone represented approximately 95 per cent of the fishplate cross section indicating it had been subjected to unusually high loading, almost certainly as a result of the train's derailment at joint A.

Track maintenance and defects

V/Line's track inspection and maintenance procedure requires *patrol inspections*, *general inspections* and *detailed inspections* to be carried out at specified frequencies. For main lines, *patrol inspections* are required to be carried by road-rail or front of train riding once a week, *general inspections* to be carried out by track walking, annually and *detailed inspections* (track geometry recording) every six months. The maintenance procedure provides specific guidelines for the assessment of non-welded joints. Cracks in fishplates, loose or damaged bolts, rail-end batter and joint gap are identified as areas for assessment.

Measurement of the track geometry was carried out in May 2013, and no defects were identified in the vicinity of the joint. The most recent inspection of this location of any type was a road-rail patrol five days before the derailment. This inspection did not identify any defects at the derailment location.

The last track walking inspection was carried out in May 2011 and there are no records for any scheduled inspections since then. At the time of the incident, track walking inspection work orders were manually generated and an order had not been generated for this location since 2011.

Track walk inspections carried out in 2009 and 2010 in the St Arnaud to Ouyen section identified 128 mechanical joint defects and 63 joint defects respectively. A track walk inspection was conducted in 2011, but no joint defects were recorded. No joint defects were recorded for 2012 or 2013, consistent with the absence of walking inspections through this section.

Safety analysis

Derailment

The derailment occurred as a result of a failed mechanical rail joint (joint A). Both fishplates in the joint had fractured due to the development and propagation of fatigue cracks and the subsequent overload failure of the fishplates prior to the passage of train 9101. Movement of the rail during the passage of train 9101 resulted in a lateral discontinuity of the running rail at the joint and the derailment of the train. It is probable that the fishplate fracture in a nearby joint (joint B) occurred subsequent to the derailment.

Rail joint failure mechanism

Track components are susceptible to fatigue due to the cyclic nature of loading during the passage of trains. The substantial fatigue cracks in joint A fishplates and the juvenile fatigue crack in one fishplate at joint B had all initiated in the plate top surface, indicating cyclic tensile stresses at the surface. The depth of the fatigue cracks at joint A indicated that the cracks had been developing for some time, with the rate of propagation increasing as the fishplates neared the point of overload failure. The overload failures at joint A were the result of the reduced intact cross sectional area in the fishplates, and occurred prior to the passage of train 9101. The battering of both rail ends indicated that trains had passed across the joint in both directions after the joint was allowed to vertically misalign with the fracture of the fishplates.

The track at the location of joint A was severely disturbed by the derailment and although it was not possible to identify any deficiencies in track support, it is possible that differential sleeper support may have contributed to higher than normal cyclic tensile stress in the top surface of the fishplates. Lower than required fishbolt torque was also identified and wear patterns indicated movement within the joint. It is possible that this movement may also have contributed to the development of the fatigue cracks, and the subsequent joint failure.

The two mechanical rail joints were located at the ends of a relatively short (11 m) section of rail. Fishplates in both joints had fatigue cracking, indicating possible factors with the installation. However, there were no records held by V/Line that identified when the installation was undertaken or the installation processes that were used.

Track maintenance

The track inspections conducted by V/Line did not identify that the joint required remedial attention. Inspections in the two years prior to the failure were limited to vehicle-based inspections and this type of inspection regime is unlikely to detect a slowly deteriorating mechanical connection. Track walking inspections are critical to the identification of degraded or defective mechanical joints. They can reveal slack or missing bolts, battering of rail ends, finning and bearing wear, all factors indicating a deteriorating rail joint. In addition, V/Line's maintenance procedure explicitly prohibits joints with unused bolt holes, other than for temporary use in an emergency. One fishplate bolt was missing from the failed rail joint A and this may have alerted the track inspectors to the presence of a deteriorating joint.

Findings

The following findings are made with respect to the derailment of freight train 9101 between Tempy and Bronzewing in Victoria on 10 August 2013.

These findings should not be read as apportioning blame or liability to any particular organisation or individual.

Safety issues, or system problems, are highlighted in bold to emphasise their importance. A safety issue is an event or condition that increases safety risk and (a) can reasonably be regarded as having the potential to adversely affect the safety of future operations, and (b) is a characteristic of an organisation or a system, rather than a characteristic of a specific individual, or characteristic of an operating environment at a specific point in time.

Contributing factors

- Higher than normal cyclic tensile stresses resulted in the development of fatigue cracks in both fishplates and their subsequent fracture. These stresses possibly resulted from the degraded condition of the joint or excessive bending movement at the joint due to differential track support or a combination of both.
- **V/Line's track inspection regime did not identify the degraded condition of the mechanical rail joints. [Safety issue]**
- Under the passage of train 9101, the rail ends of the failed mechanical joint laterally misaligned resulting in discontinuity in the running surface.

Other factors that increased risk

- **Track walking inspections were not conducted at intervals specified by V/Line's maintenance program. [Safety issue]**

Safety issues and actions

The safety issues identified during this investigation are listed in the Findings and Safety issues and 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.

Depending on the level of risk of the safety issue, the extent of corrective action taken by the relevant organisation, or the desirability of directing a broad safety message to the rail industry, the ATSB may issue safety recommendations or safety advisory notices as part of the final report.

Degraded rail joint was not detected

Number:	RO-2013-021-SI-01
Issue owner:	V/Line Pty Ltd
Type of operation:	Rail infrastructure manager
Who it affects:	All operators of freight trains and infrastructure managers.

Safety issue description:

V/Line’s track inspection regime did not identify the degraded condition of the mechanical rail joints.

Proactive safety action taken by V/Line Pty Ltd

V/Line has introduced processes to ensure that track walking inspections are carried out at frequencies specified by their maintenance regime. In order to improve the detection of track defects V/Line is providing maintenance workers with specific inspection criteria related track infrastructure including joints and fastenings in their work orders.

Action number: RO-2013-021-NSA-057

ATSB comment/action in response:

The ATSB is satisfied that the action taken by V/Line Pty Ltd addresses this safety issue.

Current status of the safety issue

Issue status: Adequately addressed.

Justification: Ensuring that track walking inspections are scheduled and carried out regularly and the provision of specific inspection criteria would enhance the probability of identifying defects in joints and fastenings.

Track inspections frequency

Number:	RO-2013-021-SI-02
Issue owner:	V/Line Pty Ltd
Type of operation:	Rail infrastructure manager
Who it affects:	All operators of freight trains and infrastructure managers.

Safety issue description:

Track walking inspections were not conducted at intervals specified by V/Line's maintenance program.

Proactive safety action taken by V/Line Pty Ltd

Track walking inspection work orders are currently manually generated. V/Line is updating its maintenance program to create automated work orders for Track walking inspections.

V/Line has ensured that all regions on the V/Line network have been made aware of outstanding track walking inspections.

Action number: R0-2013-021-NSA-058

ATSB comment/action in response:

The ATSB is satisfied that the action taken by V/Line Pty Ltd addresses this safety issue.

Current status of the safety issue

Issue status: Adequately addressed.

Justification: Automating the generation of work orders for track walk inspections should ensure that inspections are scheduled to the frequencies specified by V/Line's maintenance program.

General details

Occurrence details

Date and time:	10 August 2013 – 0834 EDT	
Occurrence category:	Incident	
Primary occurrence type:	Derailment	
Location:	Between Tempy and Bronzewing, Victoria	
	Latitude: 35° 15.125’ S	Longitude: 142° 24.186’ E

Train details

Train operator:	Pacific National	
Registration:	PN 9101	
Type of operation:	Rail: Freight	
Persons on board:	Crew – 2	Passengers – Nil
Injuries:	Crew – Nil	Passengers – Nil
Damage:	Substantial	

Sources and submissions

Sources of information

The sources of information during the investigation included:

- V/Line Pty Ltd
- Pacific National
- ALS Global

References

Cope. G.H, (1993), British Railway Track, Design, Construction and Maintenance, The Permanent Way Institution, Echo Press, Loughborough, Leics., England.

Submissions

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

A draft of this report was provided to the V/Line Pty Ltd, Pacific National, Office of the National Rail Safety Regulator and the crew of train 9101.

Submissions were received from the V/Line Pty Ltd and the Office of the National Rail Safety Regulator. The submissions were reviewed and where considered appropriate, the text of the report was amended accordingly.

Australian Transport Safety Bureau

The Australian Transport Safety Bureau (ATSB) is an independent Commonwealth Government statutory agency. The ATSB is governed by a Commission and is entirely separate from transport regulators, policy makers and service providers. The ATSB's function is to improve safety and public confidence in the aviation, marine and rail modes of transport through excellence in: independent investigation of transport accidents and other safety occurrences; safety data recording, analysis and research; fostering safety awareness, knowledge and action.

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, as well as participating in overseas investigations involving Australian registered aircraft and ships. A primary concern is the safety of commercial transport, with particular regard to fare-paying passenger operations.

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

Purpose of safety investigations

The object of a safety investigation is to identify and reduce safety-related risk. ATSB investigations determine and communicate the factors related to the transport safety matter being investigated.

It is not a function of the ATSB to apportion blame or determine liability. At the same time, an investigation report must include factual material of sufficient weight to support the analysis and findings. At all times the ATSB endeavours to balance the use of material that could imply adverse comment with the need to properly explain what happened, and why, in a fair and unbiased manner.

Developing safety action

Central to the ATSB's investigation of transport safety matters is the early identification of safety issues in the transport environment. The ATSB prefers to encourage the relevant organisation(s) to initiate proactive safety action that addresses safety issues. Nevertheless, the ATSB may use its power to make a formal safety recommendation either during or at the end of an investigation, depending on the level of risk associated with a safety issue and the extent of corrective action undertaken by the relevant organisation.

When safety recommendations are issued, they focus on clearly describing the safety issue of concern, rather than providing instructions or opinions on a preferred method of corrective action. As with equivalent overseas organisations, the ATSB has no power to enforce the implementation of its recommendations. It is a matter for the body to which an ATSB recommendation is directed to assess the costs and benefits of any particular means of addressing a safety issue.

When the ATSB issues a safety recommendation to a person, organisation or agency, they must provide a written response within 90 days. That response must indicate whether they accept the recommendation, any reasons for not accepting part or all of the recommendation, and details of any proposed safety action to give effect to the recommendation.

The ATSB can also issue safety advisory notices suggesting that an organisation or an industry sector consider a safety issue and take action where it believes it appropriate. There is no requirement for a formal response to an advisory notice, although the ATSB will publish any response it receives.

Australian Transport Safety Bureau

Enquiries 1800 020 616
Notifications 1800 011 034
REPCON 1800 011 034
Web www.atsb.gov.au
Twitter @ATSBinfo
Email atsbinfo@atsb.gov.au

Investigation

ATSB Transport Safety Report
Rail Occurrence Investigation
Derailment of freight train 9101
24 km south of Ouyen, Victoria, 10 August 2013

RO-2013-021
Final – 1 August 2014