Australian Government
Australian Transport Safety Bureau

Derailment of freight train 9204V

Sims Street Junction, West Melbourne, Victoria | 4 December 2013

Investigation

ATSB Transport Safety Report
Rail Occurrence Investigation
RO-2013-027
Final – 13 January 2015

Cover photo source: Chief Investigator, Transport Safety (Vic)

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Addendum

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Safety summary

What happened

The Pacific National broad-gauge freight train, No. 9204V, was travelling from Warrnambool to Appleton Dock, Victoria. Due to track works at West Footscray Junction—to repair damage arising from a previous derailment—the train was despatched from Tottenham Yard toward the port via an alternative route, the adjacent dual-gauge Main line. Track circuit failures resulting from the track damage meant that Up-direction Home signals on the Main line were displaying Stop indications, and for this reason the train had departed Tottenham yard on the authority of a Signalman's Caution Order. The locomotive crew received two further Caution Orders en-route, the last of these being for Home signal DYN158.

Signal DYN158 protected a turnout that provided for a diverge of the standard-gauge line away from the broad-gauge, and the network control officer (NCO) had inadvertently set this turnout for a standard-gauge movement. The locomotive crew proceeded past the Home signal and through the points, resulting in derailment of the locomotive and one wagon at low speed.

What the ATSB found

The ATSB found that the NCO had established a standard-gauge route beyond signal DYN158 rather than the required broad-gauge route. Although the Train Control System software incorporated an on-screen gauge alarm to warn an NCO against setting an unviable route, in this instance that screen alert did not appear, since its generation was contingent on the gauge detection system that was not functioning. The signalling system had been degraded as a result of a previous derailment.

The Train Control System permitted the NCO to establish a route on an incorrect gauge for train 9204 and displayed that route as viable.

What's been done as a result

ARTC has introduced provisions to ensure that modifications made to the Phoenix Train Control System display are fully understood by Control Centre staff, and has also modified the Signalman's Caution Order form to provide explicitly for the checking of the intended route and for the train crew to check the setting of points to be traversed.

The ATSB has recommended that ARTC undertakes further action to address the risk of directing trains onto incorrect gauge track in dual-gauge territory.

Safety message

When the signalling system and the functionality of safety intervention devices is degraded and an alternative process of safeworking is in use, there is a need for a heightened level of awareness and caution on the part of network control officers and train crew.

When designing control system safety mechanisms, such as the Gauge Alarm in this instance, the rail operator should consider all possible sub-system failures to ensure the intervention remains effective under all circumstances.

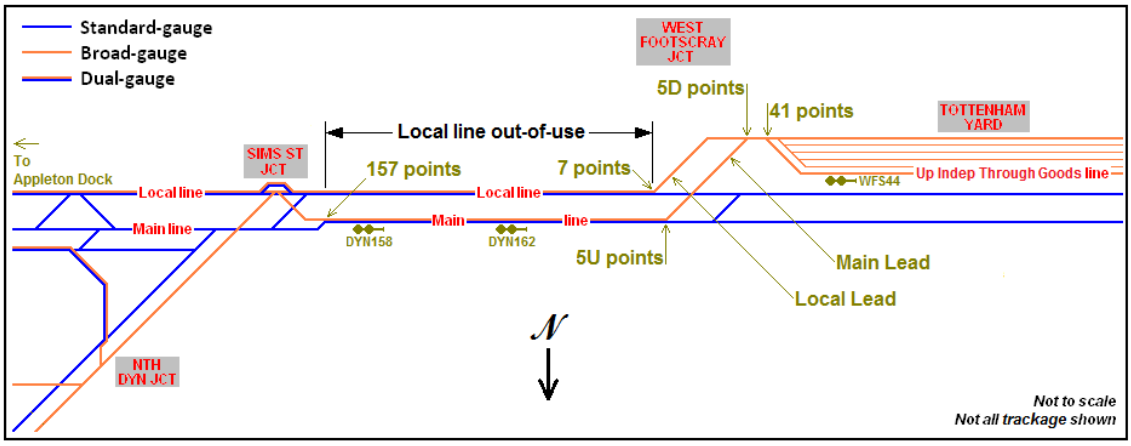
Contents

The occurrence

Train 9204V[1]—a scheduled broad-gauge container freight service—had departed Warrnambool at about 1950 on 3 December 2013 (the previous evening) and arrived in Tottenham Yard shortly after midnight. Arriving via the Up Independent Through Goods line, the train halted at Home signal[2] WFS44 (Figure 1[3]). Due to track damage arising from the derailment of a freight train six days earlier, this signal was displaying a Stop indication and could not be cleared by the NCO[4].

Train 9204 would normally have been routed via the Local line (accessed from Tottenham Yard by the 'Local lead'), however on this occasion the damage to № 7 points precluded this, and the NCO established a route via the Main lead and Main line. The locomotive crew received a Signalman's Caution Order[5] to proceed past signal WFS44, a pointsman hand-wound the 5U and 5D points to provide a route for train 9204 to the Main line, and shortly after 0125 train 9204 departed Tottenham Yard for the Port of Melbourne.

Figure 1: Simplified area diagram



Source: Chief Investigator, Transport Safety (Victoria)

The damage resulting from the previous derailment had also affected the operation of 'gauge detection'[6], therefore there was no input to the Train Control System (TCS) of the track gauge of trains moving on the Main line through that area.

En-route from West Footscray Junction to Sims Street Junction the train encountered two further Home signals displaying Stop indications, requiring the locomotive driver to contact the NCO and be issued with a Caution Order in each instance. At the second of these, DYN158, the NCO discussed the problem with the driver and advised that the next signal (DYN138, see Figure 4)

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[1] Although the train is designated by ARTC with a 'V' to denote operation in Victoria, this was not used by network control officers or train operator staff when discussing the train, nor was it used on the network controller's train control diagram. The 'V' descriptor is not applied throughout the remainder of the report.

[2] Home signals are 'absolute' (Stop-and-Stay) signals connected to an interlocking at which the potential exists for a conflict of traffic. The most restrictive indication of any absolute signal is 'Danger - Stop', which prohibits passage. Trains cannot pass them in this condition without obtaining a Signalman's Caution Order from the controlling authority.

[3] Depicts the track layout diagrammatically, not as it appears physically.

[4] 'Network Control Officer' is the ARTC job title for that person conducting train or rail traffic control activities.

[5] The full name for this safeworking instrument is *SIGNALMAN'S CAUTION ORDER FOR DRIVER TO PASS A HOME SIGNAL AT THE 'STOP' POSITION.* It is a means of conveying authority from a signaller or train control authority to a train driver to pass—under prescribed circumstances—a Home signal that is displaying a Stop indication.

[6] A gauge-detection system is applied in areas of dual-gauge trackage. The system functions by registering wheel flanges passing sensors adjacent to the three rails at specific locations. This identifies the gauge of the train and provides that information to the track interlocking system for use with signal indicators, interlocking functions and remote train control displays.

was displaying a Proceed indication and that this current Caution Order (for DYN158) should be the last they would need to receive. However, the NCO had inadvertently set the route beyond signal DYN158 for the standard-gauge direction and neither the NCO nor the locomotive crew noticed this.

At about 0141, the NCO issued the Caution Order for train 9204 to pass signal DYN158. The train was then taken past the signal and travelled approximately 130 metres before it encountered the № 157 point blade set for the standard gauge track, whereupon the train derailed as the broad-gauge and common rails diverged.

Figure 2 shows the dual-gauge Main line separation at Sims Street Junction. The standard-gauge diverges to the left and continues as the Main line while the broad-gauge track extends directly ahead to connect with the Local line (seen in parallel to the right).

Figure 2: 157 points – dual-gauge separation

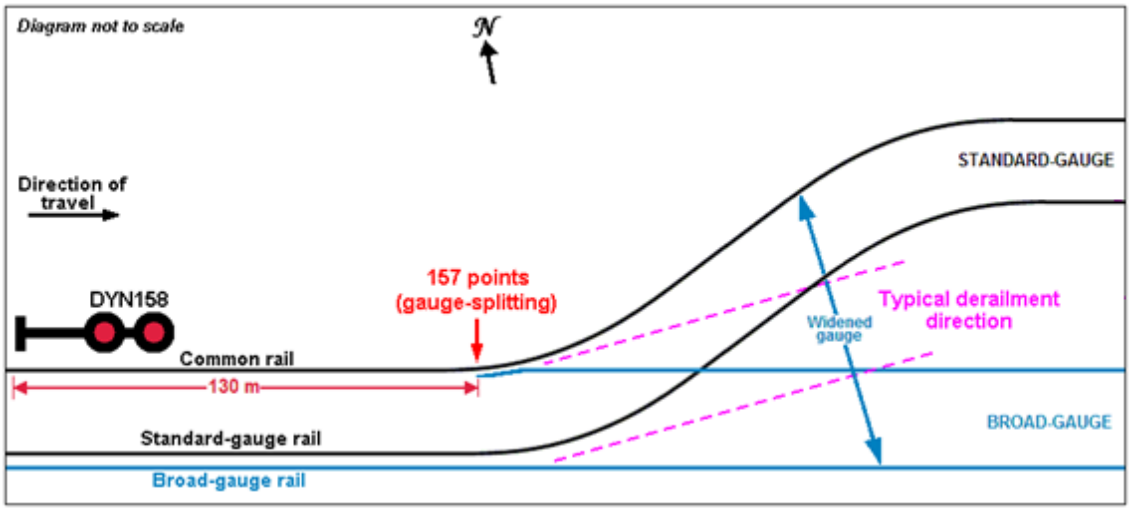
Source: Chief Investigator, Transport Safety (Victoria)

Context

Points configuration

Dual-gauge track comprises three running rails; one being common to both gauges. Gauge-splitter points consist of a single point blade that switches the common rail for either the broad- or standard-gauge direction. At locations—such as Sims Street Junction—where the diversion is achieved via the standard-gauge track turning away from the broad-gauge, the broad- and standard-gauge rails diverge and the common rail becomes a separate running rail for each track according to the setting of the point blade. From this arrangement, it follows that if a broad-gauge train should proceed into a standard-gauge route set in this manner, it will derail by dropping into the 'centre' as the available rail gauge widens due to the broad-gauge and common rail divergence (Figure 3).

Figure 3: Diagram of derailment scenario at Sims Street Junction



Source: Chief Investigator, Transport Safety (Victoria)

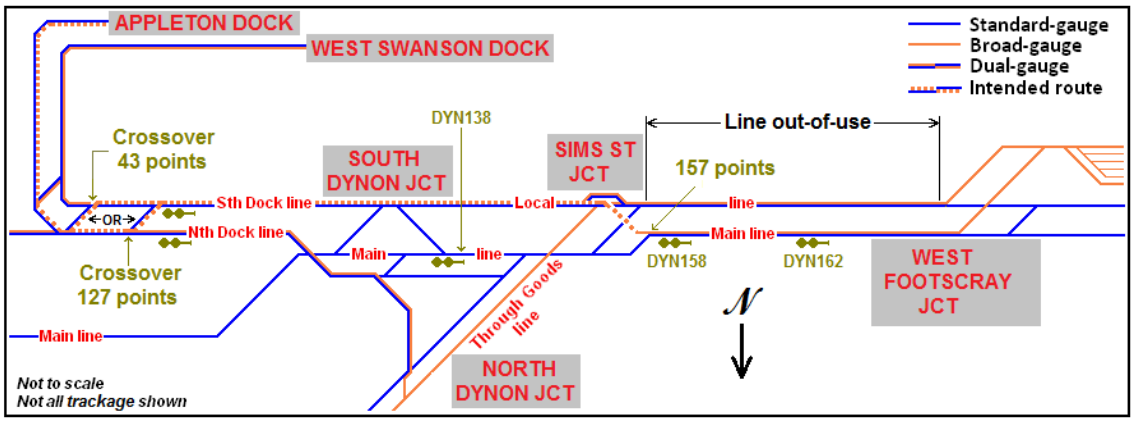
Area layout

Broad-gauge freight trains arriving into Melbourne from the west and bound for a destination in the Dynon or Port of Melbourne precincts are routed via the perimeter of the Tottenham rail yard onto either the Main or Local line—both of which are bi-directional—via their respective connecting Lead tracks (Figure 1). At Sims St Junction, these trains are either routed onto the broad-gauge Through Goods line for access to the Dynon Sidings or they continue to the South Dock line for access to the Port of Melbourne (as was the intention in this case, Figure 4). Any such train that has travelled from West Footscray Junction via the Main line, will be required—at Sims Street Junction—to separate from the standard-gauge and connect with the Local line. The standard-gauge track diverges at № 157 points, which is a single-blade 'gauge-splitter'[7] arrangement protected by Home signal DYN158.

[7] See Figure 3. Points installations are often also referred-to as 'turnouts'.

About a week earlier, on 29 November 2013, a broad-gauge freight train had derailed at the № 7 points (the Local lead) at West Footscray Junction, damaging approximately 100 metres of track. This rendered the Local line between West Footscray Junction and Sims Street Junction unusable and caused the gauge detection system and track circuits at this location to be unserviceable. This, in turn, resulted in signals affected by these track circuits being unable to assume a Proceed indication.

Figure 4: Simplified area diagram showing the correct route for train 9204



Source: Chief Investigator, Transport Safety (Victoria)

Train Control System

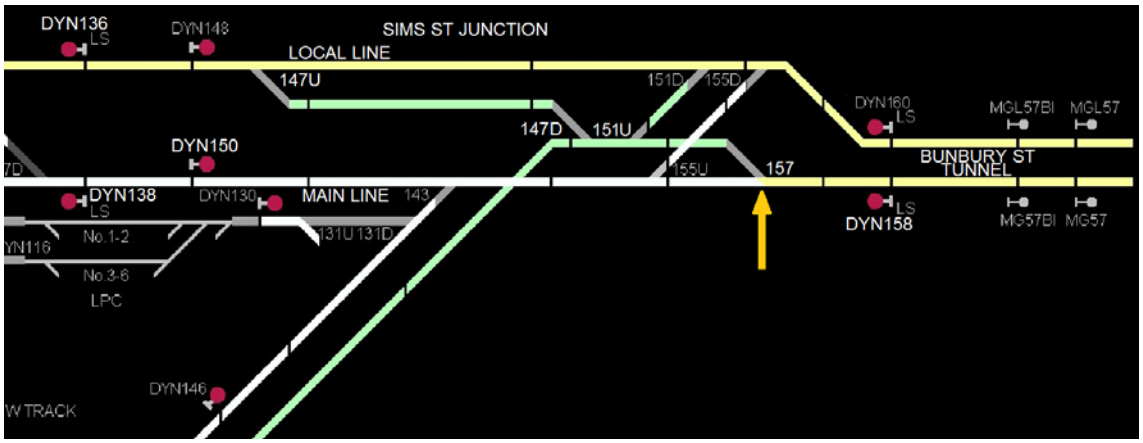
The section of line between West Footscray Junction and Sims Street Junction consists of two parallel bi-directional tracks and is part of the Defined Interstate Rail Network[8]. The section is worked under the provisions of Automatic Block Signalling (ABS)[9] and is controlled—from the ARTC Network Control Centre West at Mile End in South Australia—by an NCO working the 'Melbourne Metro board' within this centre. Network controllers utilise the proprietary *Phoenix TD Pro* micro-processor-based desktop Train Control System, via an interactive display monitor.

Figure 5 shows the track layout at Sims Street Junction as viewed by an NCO on their TCS screen. Yellow depicts dual-gauge track, green is broad-gauge, and white is standard-gauge. Reading from right-to-left, the Main (lower) and Local lines are depicted approaching from Footscray toward Sims Street Junction. The two track gauges comprising the Main line diverge at № 157 points (arrowed). The intended and correct route for train 9204 was via 157 and 151U points, then the 147 crossover (147D/147U points) to access the Local line. Note that in diagrammatic form, the graphic presentation lacks spacial context. As a result, the screen display of network trackage at the 157 points represents the broad-gauge as diverging (to the right in the direction of travel) and the standard-gauge Main line continuing straight ahead when in reality the opposite is the case (refer to Figure 3).

[8] The Defined Interstate Rail Network (DIRN) is the group of standard-gauge railway routes owned or leased by Australian Rail Track Corporation (ARTC), that comprises the national interstate rail network. It consists of corridors owned by ARTC and various others leased from the states of Victoria, New South Wales, and Queensland.

[9] A railway safeworking system in which a series of signals divide a line into a series of track sections, or 'blocks'. The system automatically controls the movement of trains between the blocks and is designed to allow trains operating in the same direction to follow each other in a safe manner without risk of rear-end collision once the controlling entity has established a route.

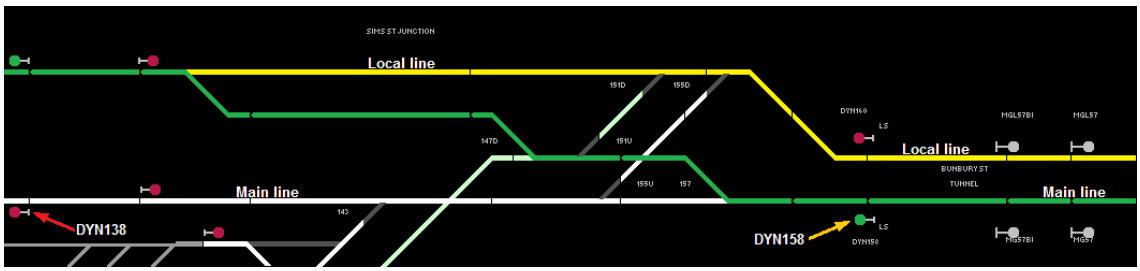
Figure 5: Portion of NCO's screen display showing Sims Street Junction



Source: ARTC. Adapted by Chief Investigator, Transport Safety (Victoria)

Figure 6 depicts the Sims St Junction location as it would appear on the TCS screen with the route correctly set for broad-gauge access from the Main line to the Port.

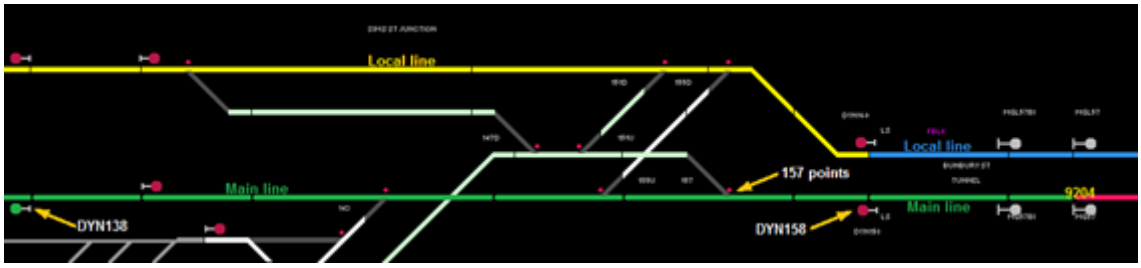
Figure 6: Screen display showing correct broad-gauge route



Source: ARTC – Adapted by Chief Investigator, Transport Safety (Victoria)

Figure 7 replicates Figure 6 but depicts conditions at the time of the incident and the route set by the NCO for train 9204 (seen depicted in red as it approaches from the right). Although this route is unviable for train 9204 beyond the 157 points, the train control system does not prevent it from being selected and set, since it includes a valid standard-gauge component throughout.

Figure 7: Screen display showing the route as inadvertently set for train 9204



Source: ARTC – Adapted by Chief Investigator, Transport Safety (Victoria)

The network control officer

The NCO had about 19 month's experience and had qualified in Victorian Automatic Block Signalling about 15 months previously. The NCO's total exposure to the Melbourne Metro control board consisted of 31 shifts 'learning', 5 shifts 'under assessment', and 21 shifts in control of the board. At the time of this incident the NCO held current safeworking qualifications and a medical assessment consistent with their rostered duties.[10]

The NCO had made various field trips to observe and become acquainted with trackage controlled from the Melbourne Metro board. On the 18th November 2013—16 days before the incident—the NCO travelled in a locomotive cab to inspect the route from Adelaide to Melbourne (Southern Cross Station); on 19th November 2013 the NCO undertook a Hi-Rail[11] track familiarisation trip through the 'Melbourne Metro' area and the North East main line to Somerton; and on 20th November undertook a Hi-Rail track familiarisation trip between Tottenham and Geelong.

The morning on which this incident occurred was the NCO's first night shift following several day shifts and one full day off duty. The NCO reported having obtained 'plenty of sleep' and feeling adequately rested, and there were no indications that fatigue impairment had contributed to their actions. The NCO was about two hours into the shift and had managed a variety of shunt movements around the Dynon/Sims Street location but train 9204 was the first broad-gauge movement for the shift. At interview, the NCO stated that this particular shift had been more demanding than normal due to the unusual arrangements in place caused by the infrastructure damage at West Footscray and a weather-related signalling issue in an adjacent section.

The locomotive crew

Both locomotive crew members were engaged primarily on broad-gauge operations, had satisfied Pacific National's requirements for and were experienced at operating broad-gauge trains through this area, and stated in their records-of-interview that they had recently travelled over this section of track. Both locomotive crew members held current medical assessments as being fit for duty[12] and were tested—with negative results—for the presence of alcohol and prescribed drugs.

The train

Train 9204 was conveying loaded shipping containers from Warrnambool to Appleton Dock. The train consisted of locomotive A79 and 16 wagons, had a gross mass of 1,158 tonnes, and was 330 metres in length.

Previous occurrence

The ATSB investigated a derailment[13] that occurred in March 2013 at a location adjacent to Sims Street Junction. In this occurrence, the NCO set a route for a broad-gauge train, however, the route selected was standard-gauge-only beyond a Home signal. Having detected the train as broad-gauge and therefore incompatible with the remainder of the established route, the interlocking prevented the Home signal from clearing. However, the train was taken past the signal under authority of a Signalman's Caution Order and proceeded for a distance of about 40 metres where the broad-gauge rail ended, resulting in the train derailing.

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[10] Per requirements of *National Standard for Health Assessment of Rail Safety Workers*.

[11] A global industry term that refers to a wheeled vehicle that usually travels on roads but that has been modified to also run on rail lines and that can be quickly configured to travel in either mode (hence ***Hi***ghway-***Rail***way).

[12] Per requirements of National Standard for Health Assessment of Rail Safety Workers.

[13] ATSB Transport Safety Report, Rail Occurrence Investigation RO-2013-009.

The ATSB findings included that when the NCO established the route, the train control system provided no indication that sections of it were dual-gauge and sections were single-gauge. When the train approached the Home signal, there was minimal indication that the train gauge and the selected route were incompatible.

Following this incident ARTC modified the Train Control System software to generate an interactive Gauge Alarm in the event that an NCO attempted to establish a route within which the track gauge varied. ARTC also modified the Signalman's Caution Order form to include explicit prompts to an NCO to ensure the route being established was gauge-compatible with the train about to traverse it and that route integrity had been verified. The revised Caution Order form was planned for issue on the day following this derailment and was thus not available to NCOs at the time this incident occurred.

Safety analysis

Degraded signalling

A previous derailment had rendered the Local line between the West Footscray and Sims Street Junctions unavailable and imposed the requirement to use an adjacent line. Damage to track circuitry had resulted in degraded interlocking functionality and no gauge detection. Under normal conditions, the input from gauge detection will ensure that signals cannot clear to authorise train movements between dissimilar track gauges and will generate an on-screen Gauge Alarm[14] should the NCO attempt to establish an unworkable route. The gauge-detection sub-system also provides an input to the train control system to generate a visual indication—by way of a small alpha symbol—to signify whether the train approaching on the route is occupying the broad- or the standard-gauge track. In this case, the lack of this input deprived the NCO of the benefit of two key visual indications designed to prevent the setting of an unviable route.

Train Control System

The train control system permitted the NCO to set a route that directed the train onto trackage of an incorrect gauge. The system display normally depicted the varying track gauges in different colours, however this distinction was lost once a route was selected and validated by the train control system. Due to the lack of gauge detection, the TCS could provide neither a gauge-advisory symbol on the screen nor permit the generation of a Gauge Alarm. Therefore there was nothing to indicate to the NCO that the route (Figure 7) was unfeasible. Depicting the route as viable—when in fact it was not—established conditions conducive to operator misperception.

Human performance is, by its nature, highly variable and subject to a number of influencing factors. Even the most experienced and knowledgeable of operators will experience lapses in performance. For that reason, high-risk industries design error-resilient systems of work, with ‘defences in depth’ to capture errors before they result in an accident or serious incident.

The resilience of the TCS under circumstances where Gauge Detection has been lost is diminished by the lack of an alternate source for identifying the gauge of the train. As noted in the previous report (ATSB Rail Occurrence Investigation RO-2013-009), the provision of gauge information to the NCO after a route is selected and locked would have reduced the safety risk.

The Network Control Officer

Although being relatively new to the Melbourne Metro train control board, the NCO was qualified to manage this rail traffic and was familiar with the track layout. During this shift, the NCO had been predominantly engaged in handling ‘back-and-forth’ moves between the Pacific National Locomotive Provisioning Centre and South Dynon yard destinations rather than mainline traffic. The NCO’s workload, though, was increased by having to manage operational changes generated by the closure of the Local line and by weather-related track circuit failures elsewhere.

The NCO was unused to handling traffic ex-Tottenham Yard via the Main line, especially when gauge detection was not available. Under these circumstances it would have been prudent for ARTC to have augmented their management of the corridor.

[14] This cautionary intervention was a TCS modification made as a result of an incident about 11 months earlier in a nearby location (report referred-to above) and having certain similar characteristics.

The NCO reported having believed they had set the route for the train to run from the Main line across to the Local line and recalled that the screen display was showing a green viable route but that the signals had not cleared. When setting a route on the train control system, an NCO's route-setting[15] actions with respect to cursor control require precision; otherwise an unintended route can easily be established. In this instance, in establishing the entry point for movement of train 9204 from the Main line at signal DYN158 to the port, the NCO unintentionally 'clicked' beyond signal DYN158 instead of before it, and in consequence established a route along the standard-gauge Main line instead of via broad-gauge crossover № 147.

The NCO did not mistake the broad-gauge train for a standard-gauge one (and route it to the standard-gauge for that reason). The train was incorrectly routed with the NCO aware that it was broad-gauge. Therefore the error was in the NCO not detecting that the route being displayed was for a standard- rather than a broad-gauge train, and in the absence of the one control normally in place to alert the NCO to such an error (the Gauge Alarm), there were no constraining functions within the system to detect and prevent this error.

The locomotive crew

When authorised to pass a Home signal at Stop, a locomotive driver is directed to '…proceed cautiously as far as the next fixed signal.' This cautionary prompt reflects the fact that a controller cannot always know why the signal will not clear to 'Proceed' and conveys a precise intention to prompt locomotive crews to proceed with vigilance. ARTC's book of operating rules (TA-20) [16] does not formally define what is meant by 'proceed cautiously', however under these circumstances it is expected that the crew will scrutinise the track ahead for any obstruction, irregularity, or discontinuity, and will attempt to stop before encountering it. A set of points ahead being incorrectly set for the intended move is a significant hazard, that could lead either to derailment (as in this case) or collision.

Expectancy

On this night, the movement of train 9204 required the receipt by the locomotive crew of three Signalman's Caution Orders. The first was authorisation to pass signal WFS44 at Tottenham Yard, with the route being manually set by a pointsman, and therefore leaving the train crew with no particular routeing issues to be concerned with. The second was for authorisation to pass signal DYN162 en-route – again, with no related interlocking to be considered by the locomotive crew[17]. The third was issued to the driver at signal DYN158, along with a comment from the NCO that the next signal had cleared and that the Caution Order now being issued should be the last they would need. This latter comment by the NCO was in the context of providing advice to the locomotive driver that the reason that signal DYN158 had not cleared was due to a state of 'double-discrimination' within the gauge detection system[18] and was the NCO's first advice to the locomotive crew of this faulty track state. The NCO continued by informing the driver that the next signal (DYN138) was at Proceed and that everything should be OK from there on. Neither the driver nor the NCO recognised that signal DYN138 did not apply to the broad-gauge route to Appleton Dock.

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[15] 'Route-setting' from a remote control facility involves the controller selecting and identifying an entry and an exit point for a train movement within the available network trackage. From this action, the Train Control System itself will establish a route between those two points.

[16] ARTC Code of Practice for the Victorian Main Line Operations.

[17] Although it is a Home signal, DYN162 does not protect an interlocking. It is provided specifically as protection for shunt movements extending onto the Main line from the Dynon yard areas. Such a shunt movement will occupy the Main line for a period of time, including within the Bunbury Street tunnel. There are no points associated with signal DYN162.

[18] 'Double discrimination' refers to the gauge detection system being in a degraded condition in which it cannot differentiate between standard- and broad-gauge occupation and presents the selected route as neither.

This series of actions created a sequence of authorised passing of signals that were displaying Stop indications but without any apparent need for attendant concern on the part of the locomotive crew regarding the condition of the route beyond each one. Having passed two of these signals with a Signalman's Caution Order without incident, and now having been provided with a reasonable explanation for the degraded signalling system, it is probable that the locomotive crew established an expectation that passing signal DYN158 was also simply a procedural event with no additional actions related to track or routeing issues to be considered.

The Caution Order form

The locomotive driver stated that the NCO had not advised that there was a need to stop and inspect the points. He stated that if the NCO required them to do this, they would be advised of such via the Caution Order form. This comment reflects the existence of different Caution Order processes for the different Safe Working environments. The Caution Order procedure pertaining to CTC (Centralised Traffic Control) territory[19] includes specific instructions to stop and inspect the points beyond the signal being passed at Stop, whereas the process for ABS (the Signalman's Caution Order, as applied in this case) carried no such requirement. Territory that is both ABS and dual-gauge, as existed at Sims St Junction, provides an elevated risk profile under the degraded conditions that existed, and as such would be worthy of a procedure that prescribes the checking of points and verification of the routeing by the crew in order to prevent this type of incident. Since similar critical safety concerns apply with the use of both the CTC and ABS instruments, it would also be beneficial for there to be greater definition and clarity around instructions in TA-20 pertaining to their use.

[19] Centralised Traffic Control (also Centralised Train Control). A form of control of railway operations infrastructure by which a train controller can directly control points and signals—and thus manage rail traffic flows—across a region, from a remote (centralised) location.

Findings

From the evidence available, the following findings are made with respect to the derailment of train 9204 at Sims Street Junction on 4 December 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

- Track damage resulting from a previous derailment had forced the use of an alternative route along which gauge detection was not operating.
- **The Train Control System permitted the NCO to set an unviable route for the train and then displayed it as viable. The train control system alarm alerting the NCO to the setting of an unviable route was nullified by the absence of gauge detection. [Safety Issue]**
- The NCO set a standard-gauge route for the broad-gauge train and did not notice having done so.
- The locomotive crew did not observe—in sufficient time—the incorrect setting of the points.

Other factors that increased risk

- **A caution order instrument was used that lacked a specific requirement for train crews to check the points along their route. This requirement becomes critical under circumstances of signalling system degradation. [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.

All of the directly involved parties were provided with 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.

Train Control System – design and screen display

Number:	RO-2013-027-SI-01
Issue owner:	Australian Rail Track Corporation
Type of operation:	Rail – infrastructure
Who it affects:	ARTC network controllers

Safety issue description:

The Train Control System permitted the NCO to set an unviable route for the train and then displayed it as viable. The train control system alarm designed to alert the NCO to the setting of an unviable route was nullified by the absence of gauge detection.

Response to safety issue and/or Proactive safety action taken by Australian Rail Track Corporation

In future, if modifications are made that alter or add to the Phoenix Train Control System display presentation, ARTC will provide both an engineering brief of the effects of this modification and operational instructions to Network Control Centre personnel.

ATSB comment in response

The action taken by ARTC does not address the inadequacy of the TCS system to prevent the NCO from setting a route of incorrect gauge in dual-gauge territory.

ATSB safety recommendation to ARTC

Action number: RO-2013-027-SR-076

Action status: Released

The Australian Transport Safety Bureau recommends that ARTC undertake further action to address the risk of directing trains onto incorrect gauge track in dual-gauge territory.

Flaw in Caution Order form

Number:	RO-2013-027-SI-02
Issue owner:	Australian Rail Track Corporation
Type of operation:	Rail – infrastructure
Who it affects:	ARTC network controllers

Safety issue description:

A caution order instrument was used that lacked a specific requirement for train crews to check the points along their route. This requirement becomes critical under circumstances of signalling system degradation.

Response to safety issue and/or Proactive safety action taken by Australian Rail Track Corporation

ARTC has made changes to the Signalman's Caution Order (Form number 2377). The changes include a requirement for the NCO, when issuing a Signalman's Caution Order, to ensure the following actions are undertaken:

- That route-setting is checked as to its compatibility with the gauge of the train about to receive the Signalman's Caution Order;
- That route integrity has been verified by reference to the Phoenix display;
- That the driver of the train has been advised to ensure that all points to be traversed are correctly set;
- That confirmation is to be noted in the new check box area provided on Form 2377 adjacent to each of these requirements.

ATSB comment in response

The ATSB is satisfied with the actions taken by ARTC to address the safety issue.

General details

Occurrence

Date and time:	4 December 2013 – 0145 EDT	
Occurrence category:	Incident	
Primary occurrence type:	Derailment	
Location:	№ 157 points, Sims Street Junction, West Melbourne	
	Latitude: 37° 48.291' S	Longitude: 144° 54.645' E

Train

Train operator:	Pacific National	
Registration:	Train № 9204	
Type of operation:	Rail - freight	
Persons on board:	Crew – 2	Passengers – N/A
Injuries:	Crew – Nil	Passengers – N/A
Damage:	Minor to locomotive and rollingstock	

Sources and submissions

Sources of information

Information and evidence for this investigation was sourced from Australian Rail Track Corporation Ltd and Pacific National Pty Ltd and directly-involved employees.

Submissions

Under Part 4, Division 2 (Investigation Reports), Section 26 of the *Transport Safety Investigation Act 2003* (the Act), the Australian Transport Safety Bureau (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 Transport Safety Victoria, Public Transport Victoria, Australian Rail Track Corporation, Pacific National, the network control officer, and the locomotive crew members involved.

Any submissions from these parties were reviewed and where considered appropriate, the text of the draft 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, and; 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 safety factors related to the transport safety matter being investigated. The terms the ATSB uses to refer to key safety and risk concepts are set out in the next section: 'Terminology Used in this Report'.

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

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Investigation

ATSB Transport Safety Report
Rail Occurrence Investigation
Derailment of freight train 9204V, Sims Street Junction
West Melbourne, Victoria, 4 December 2013

RO-2013-027
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