This is a collation of some of the world’s railway formal inquiry reports. It includes a brief incident synopsis, along with the main causes and recommendations from each investigation. Readers may find some of the actions and recommendations useful to their own operations.

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Key issues in this edition:

- Crossing user behaviour
- Implications of headphone use
- Track maintenance – practice and procedure
- Wagon maintenance
- Wagon brake testing
- Container loading (haulier)

Published 14 January

UK: Fatal accident at Kings Mill No. 1 level crossing, Mansfield, 2 May 2012

For the full report, click here: LINK

At 16:32 on 2 May 2012, a train travelling from Nottingham to Mansfield Woodhouse struck a cyclist crossing the line at Kings Mill No.1 level crossing, near Mansfield, Nottinghamshire. The cyclist suffered serious injuries and died at the scene.

The cyclist was unaware of the train’s approach, probably because he had not looked towards it after passing through the gate protecting the crossing. He also had his hood up and was wearing earphones, which probably prevented him from hearing warnings sounded by the train’s horn.
RAIB identified the following key learning point:

*The possibility of making relatively small changes which may reduce the risk at crossings can be overlooked if those responsible are concentrating on the feasibility of major changes, such as provision of warning lights or total closure. At Kings Mill, the crossing deck was straightened after the accident to reduce the traverse time and thus the time that users are exposed to the hazard of approaching trains. This is one of the options for risk mitigation described in the Level Crossing Risk Management Toolkit.*

RAIB therefore reminds crossing operators that their staff need to be aware of all the possible steps that can be taken to mitigate risks at level crossings, and they should be prepared to apply minor or interim measures pending the opportunity for significant upgrading work.

**Recommendations**

- The Health & Safety Executive and the Office of Rail Regulation should draw the attention of local authorities to the need to consider the effects and possible risk associated with developments, such as the promotion of multi-user trails, which are likely to result in an increase in the number and type of users of routes passing over level crossings, with particular reference to the needs of vulnerable groups such as the elderly, users of mobility scooters and people with small children.

**Published 21 January**

*Australia: Freight train derailment at Port Augusta, SA, 6 May 2011*

For the full report, click here: [LINK](#)

At 20:16 (local time) on 6 May 2011, the trailing bogie on the 47th wagon of a Pacific National freight train derailed after traversing a level crossing at Port Augusta, South Australia. The wagon travelled over a second level crossing and re-railed itself when it entered a third about 1,300 metres beyond. The train was eventually brought to a stand after the network controller had been alerted that the train was emitting sparks.

The Australian Transport Safety Board (ATSB) found a number of factors affecting the passage of the train due to the degradation of the track geometry in a short section of line after the first level crossing.

Multiple track defects requiring urgent and priority attention in this short section had been detected by a track geometry car inspection three months before the derailment and there was a 30 km/h temporary speed restriction (TSR) in force at the time.

However, the defects had not been adequately assessed and controlled in accordance with the Australian Rail Track Corporation (ARTC) *Track and civil code of practice*; the 30 km/h TSR was also probably inadequate to minimise the risk from derailment.

The investigation also found that track geometry defect exceedence reports did not contain fields to record the date and time as confirmation that field inspections had been carried out in accordance with the code of practice.

Multiple geometric track defects that are located in close proximity to each other significantly increase the derailment risk to rail traffic. The track condition should be thoroughly assessed and managed to ensure that appropriate speed restrictions are imposed until the track can be reinstated to design standards.
Action taken by the ARTC

Through its Alliance Partner Transfield Services, the ARTC has undertaken additional training in the ARTC Track and civil code of practice. This includes the responses required when multiple localised geometric defects are found.

The ARTC is also developing an improved reporting format for data from the track geometry car measurements for use in all states following the introduction of the new National code of practice – track standards.

Recommendations

These recommendations are addressed to the Australian Rail Track Corporation.

- The urgent and priority category defects detected by the AK Car on 4 February 2011 that were located within a 20-metres track section were inadequately assessed and controlled in accordance with the ARTC Track and civil code of practice.

  Through its Alliance Partner Transfield Services, the ARTC has undertaken additional training in the code of practice. This includes the responses required to be applied for multiple geometric defects. The ATSB is satisfied that the action taken adequately addresses this safety issue.

- Wagon defect exceedence reports produced on 4 February 2011 did not include fields to record the date and time of follow-up field inspections and to show that these inspections and assessment of defects were completed in accordance with the ARTC Track and civil code of practice.

  The ARTC is developing an improved reporting format for data for use in all states following the introduction of the National code of practice – track standards. The proposed format will be distributed to all Corridor Delivery Managers for comment and acceptance for implementation prior to October 2012. The ATSB is satisfied that the action should adequately address this safety issue.

Published 21 January

Canada: Runaway train at Quebec North Shore and Labrador, Quebec, 11 December 2011

For the full report, click here: LINK

On 11 December 2011, a freight train loaded with iron ore left Emeril Junction, Newfoundland and Labrador, and headed south. It consisted of two locomotives and 112 wagons, weighing 10,070 tons and measuring 6080 feet.

As the train approached Oreway, the driver noticed that the brake system air flow was increasing and that the tail-end air pressure was decreasing. As instructed by the rail traffic controller (RTC), the train was left overnight at Oreway due to the excessive air leaks.

The next morning, it departed and stopped in the early afternoon at Mai, Quebec, for a scheduled crew change. The outbound driver was familiar with the territory, met fitness and rest standards and was qualified for the position. He had more than 13 years’ operating experience and had been informed of the previous day’s air leakage issues.
Approaching the long grade between Bybee and Tika, the driver applied the brakes by reducing the brake pipe pressure by 10 psi to test their effectiveness. He then released the brakes when the speed started to fall and re-applied them once the train reached a speed of 13 mph, and began the descent.

When the train reached (the maximum allowable in that area), the driver gradually decreased the brake-pipe pressure to control train speed. However, the speed continued to increase and, when the train reached 38 mph, the driver applied the emergency brakes.

The driver contacted the RTC to advise of the situation and was instructed to apply hand brakes to secure the train and to wait for assistance. Just over an hour later, as the driver was returning to the locomotives, he noticed that the train was starting to move. He boarded the lead locomotive and fully applied the dynamic brakes. However, the dynamic brakes were unable to control the movement and the train continued to accelerate, reaching a maximum speed of about 63 mph. The train finally came to a stop at the bottom of the slope without derailing.

The Transportation Safety Board of Canada (TBSC) listed the following causes and contributory factors:

- No. 1 brake tests as conducted in Sept-Îles and Schefferville do not seem to be adapted to the Labrador Iron Mines (LIM) wagons involved in the incident. Therefore, the air-brake system defects were not identified and the train was authorized to continue its trip with an inadequate brake system.

- Given the condition of the air brake system on the LIM wagons, the driver lost control of the train on the slope and had to apply the emergency brakes to stop the train.

- One hour after the emergency brakes were applied and the train came to a stand, the air brakes released and, because the braking force applied by the hand brakes was insufficient, the train ran away.

- Even though all LIM wagons had been sent to shops, the vast majority of them had not received single-car tests as required by the Field manual of the AAR interchange rules. Consequently, brake-cylinder air leaks were not identified and corrected.

- Because hand-brake inspections and single-car tests were not conducted on the vast majority of cars before they were put into service, the braking-system deficiencies were not identified.

The TBSC also noted the following learning points:

- Without specific instructions that take into consideration local conditions, there is a risk from underestimating the number of hand brakes required to secure a train on a steep grade and preventing it from running away.

- Even when drivers apply sufficient torque, the forces applied by the brake shoes could prove insufficient when hand brake mechanisms are not lubricated and are improperly adjusted.

**Action taken**

After the incident, Transport Canada conducted a safety inspection on Labrador Iron Mines (LIM) wagons that revealed that many air brakes were not applying or were not remaining applied and that several hand brakes were not operating well. On 2 March 2012, the Newfoundland and Labrador Minister of Transportation and Works ordered LIM to conduct single-car tests on all its cars and to give the supporting documentation monthly to Transport Canada. Furthermore, LIM had to confirm that
brakes on all its freight cars were in accordance with *Railway freight and passenger train brake inspection and safety rules*. LIM could not put into service any cars that did not comply with these conditions.

LIM performed single-car tests on all its cars. All the necessary work for the cars to comply with the Association of American Railroads specifications was completed.

The freight operator modified its inspection and brake-test procedures for LIM wagons. It now conducts walking brake tests to examine brake cylinders and brake shoes. The company also committed to define the minimum number of required hand brakes to secure cars on heavy grades.

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**Published 28 January**

**UK: Freight train derailment Reading West Junction, 28 January 2012**

For the full report, click here: [LINK](#)

At 13:42 on 28 January 2012, a wagon on a container train derailed, and then re-railed, when traversing a crossover at Reading West Junction. There were no injuries and only minor damage to the track and the derailed wagon. However the train could have derailed elsewhere, where the consequences may have been severe. There was also significant disruption to rail services in the area.

The train was formed of 25 container-carrying flat wagons. The wagon that derailed was the 24th from the front. It was carrying a single freight container on the trailing end, which was packed with 13 pallets of automotive components, each weighing around 1300 kg. On opening the container, RAIB found that all the pallets were unsecured and had moved to the side, resulting in uneven loading on the wagon.

A survey of the track revealed a twist fault close to the point of derailment.

RAIB find the cause of the derailment to be that there was insufficient load on the front right-hand wheel of the wagon to prevent its flange climbing over the railhead. This was the combined result of the uneven loading on the wagon, specifically the lateral offset of the payload in the container, and the effect of the twist fault on the crossover.

RAIB concluded that the pallets had moved during the road journey to the freight terminal where the container was loaded onto the train. Schaeffler Automotive, the company that packed the container, had no processes at the time to ensure that the pallets would not move. The checks and handling methods used by Freightliner, the operator of the terminal, did not detect the offset load.

Although the size of the twist fault did not require the line to be blocked to traffic, Network Rail’s processes for track inspection and maintenance had not identified that it existed.

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**Additional observations**

The reliance on a track gauge to measure and quantify the track geometry during and after mechanised track maintenance work means that a track quality supervisor (TQS) cannot reliably identify twist faults that are only revealed when the track is loaded. A post-work recording run using a tamping machine could offer the TQS an opportunity to observe such faults. However, there is a lack of clarity as to whether these recording runs are necessary after hardening up work.

Undertaking mechanised track maintenance in areas of S&C with a single tamping machine using the M&C mode of operation risks track twists forming on local crossovers, and similar sections of track.
Worldwide FI Summary

Recommendations

- The Health and Safety Executive should identify and use the most appropriate means to make shippers and freight forwarders aware of the need to pack freight containers in accordance with the ‘Guidelines for packing of cargo transport units’, published by the International Maritime Organization, or an equivalent document. By the same means, it should also remind organisations of the need to have operational procedures, resources, equipment and training in place to ensure that cargo is evenly loaded and secure. The Health and Safety Executive should also make other national and international safety regulators aware of the findings of this investigation and highlight the need to follow the guidelines.

- Freightliner should review its operating procedures and conditions of carriage for freight containers. It should then implement any changes necessary to require that:
  - Senders provide certification sourced from the relevant party, or have equivalent procedural arrangements in place, which confirm that freight containers offered for transit have been packed in accordance with the ‘Guidelines for packing cargo transport units’, published by the International Maritime Organization, or an equivalent document;
  - The effectiveness of such certification or procedural arrangements are periodically audited, with remedial action taken as needed; and that where such arrangements are not in place; and
  - Alternative action is taken to confirm that the cargo in a container is both evenly and securely stowed.

  This recommendation may also be applicable to other operators of rail freight services and inter-modal freight terminals.

- Freightliner should develop requirements for a system to monitor and prevent load offsets from containers resulting in wagons with a side-to-side wheel load imbalance entering traffic from its terminals. The system should be considered when terminal equipment is planned to be installed or upgraded, and where practicable the system should be implemented. This recommendation may also be applicable to other operators of inter-modal freight terminals.

- Network Rail should review and, where necessary, improve its processes for the detection of track geometry faults after mechanised track maintenance work to reduce the likelihood of such faults going undetected before the railway is handed back into service.

- Network Rail should establish best practice guidelines for mechanised track maintenance work in areas of switches and crossings that minimise the risk of track twist and other geometry faults forming, and remaining on, crossovers and similar sections of track. It should make its track maintenance teams aware of these and the importance of following them, wherever practicable.