RAIB Summary of learning

11. Overspeeding

Purpose of this summary

The purpose of this document is to provide a repository of some of the most important areas of learning identified in RAIB's investigations to date, cross-referenced to relevant reports. It therefore provides a reference source for those looking to understand real-world railway safety issues and potential control measures.

When preparing this document, RAIB has selected those issues which:

- have recurred in different RAIB investigations
- have still to be fully addressed
- could be a factor in the cause of a fatal accident.

RAIB is aware that many of the issues raised have already been the subject of actions by duty holders when responding to RAIB recommendations or are in the process of being addressed. The inclusion of a topic in this document should not be taken to mean that no action has been taken in response to relevant recommendations. However, its inclusion indicates that RAIB considers that the issue still needs to be actively managed by duty holders.

The current status of each recommendation made by RAIB can be checked by reference to the Index of RAIB recommendations, and details of the actions taken are published by ORR.

It is not the purpose of this document to quantify the risk associated with each of the identified safety issues. Readers seeking to understand the overall risk of harm associated with various dangerous events should refer to RSSB's Annual Safety Performance Report. This presents historical information on actual harm caused, and estimates of risk based on extensive modelling.

Overview

Each section of the railway network has a defined maximum permissible speed. In some locations, there can be several maximum permissible speeds, which are dependent on the characteristics of the type of train being operated.

In some circumstances, it can be necessary to temporarily reduce these permissible speeds. Reasons for such amendments may be issues with the condition of the railway infrastructure or as a risk mitigation in the event of adverse weather such as hot weather affecting rail temperature, high winds and significant rainfall.

It is clearly vital that drivers control the speed of their train to comply with the appropriate permissible speed at that location, be that the permissible speed or a lower limit temporarily imposed. The risks associated with overspeeding include derailment, train overturning and collision with infrastructure.

A number of RAIB reports and safety digests have covered incidents of overspeeding. The learning from some of these publications is summarised below.

Important areas for safety learning

Driver expectation

As part of their training and subsequent assessments, train drivers are expected to know the permissible speed for their train on any section of the railway which they drive on. This is referred to as ‘route knowledge’. With a small number of exceptions, the UK mainline railway is signalled on the basis of ‘route signalling’. This means that the lineside signalling system provides information for the driver on the route which their train will take. The driver must then use their route knowledge to determine the permissible speed for their train. Lineside signs provide reminder information on permissible speeds. There are a small number of UK locations where a ‘speed signalling’ concept is in use – these are fitted with European Rail Traffic Management System (ERTMS) signalling. In the areas fitted with ERTMS, drivers are provided with speed information by means of a cab display screen.

In some cases, drivers have developed expectations and perceptions about which line they are on, which line they are about to take, and which aspect the signal ahead will be. Distractions of various sorts may cause a driver to lose focus on the vital task of being aware of the location of the train, and the permissible speeds for the section of track ahead. Such pre-established expectations and/or distractions can result in drivers allowing trains to exceed the permissible speed for a location.

On 11 September 2015, a train on the East Coast Main Line passed through Fletton Junction, south of Peterborough, at 51 mph (82 km/h), around twice the permitted speed of 25 mph (40 km/h). This caused the carriages to lurch sideways resulting in minor injuries to three members of staff and one passenger (report 14/2016). It is likely that the train driver had forgotten about the presence of the speed restriction due to distraction and fatigue related to family issues. Lineside signs and in-cab warnings may have contributed to the driver not responding appropriately as they approached the speed restriction and engineering controls did not prevent the overspeeding. The route risk assessment had not recognised the overspeeding risks particular to Fletton Junction and a speed limit sign at the start of the speed restriction was smaller than required by standards.

Two serious incidents occurred at Spital Junction, to the north of Peterborough station. These occurred on 17 April 2022 (report 06/2023) and on 4 May 2023 (report 10/2024). In both cases, trains travelling south passed through points at the junction at excessive speed. The coaches of the trains were subject to sudden sideways movements, leading to minor injuries to passengers. Post-incident analysis for the April 2022 event has indicated that the train was close to a speed that would have led to it overturning, and it was likely that some of the train’s wheels lifted off the rails. In both cases, the drivers of the trains did not react appropriately to the signal indication they had received on approach to Spital Junction. This signal indication was a warning that the train was to take a diverging route ahead which had a lower speed limit than the straight-ahead route which the drivers expected to take. The drivers’ awareness of the signal conditions that could be presented on approach to this junction and their training were insufficient to overcome this expectation. Common to both investigations was that neither train operators nor Network Rail had effectively assessed and controlled the risk associated with trains being unexpectedly routed on a slower, diverging route at this location.

Luggage falling from the overhead racks during the incident at Spital Jn (April 2022).

On 24 September 2024, an Elizabeth line train passed over a set of points east of Manor Park station, east London, while travelling at a speed of 45 mph (72 km/h). This was above the permissible maximum speed for this set of points, which is 25 mph (40 km/h). The train had been diverted to pass over this junction from its usual route. The sudden movement of the train resulted in some passengers losing their footing and at least one passenger fell to the floor. RAIB published a safety digest regarding this incident (safety digest 01/2025) which identified that the driver became confused about the train's location after being rerouted. The driver was unfamiliar with this infrequently-used routing, and the operator's route risk assessment did not explicitly identify the associated hazard. A lineside sign, which could have reminded the driver of the permissible speed, was incorrectly installed, of the wrong size and partially obscured by lineside equipment, which made it difficult to see. It was also covered in dirt, further reducing its conspicuity and legibility.

Two further incidents have occurred on the East Coast Main Line, at Grantham South Junction. On 25 February 2025, a southbound train departed from the station with the signal indicating that the train was to diverge from the main line onto a parallel slow line at Grantham South Junction. This divergence has a permanent speed restriction of 25 mph (40 km/h). However, the train was travelling at around 55 mph (87 km/h) when it traversed the junction. Staff reported receiving minor injuries due to the overspeed, although there were no reported passenger injuries. RAIB carried out a preliminary examination into the incident. It determined that factors in this incident were similar to those identified during RAIB's investigations into the two events at Spital Junction, Peterborough. RAIB wrote to the Office of Rail and Road to draw its attention to this incident when considering industry responses to the recommendations made in the Spital Junction reports and the wider questions within the industry around protection against overspeeding.

On 26 September 2025, a southbound train traversed the junction at 56 mph (90 km/h). A passenger reported being injured by luggage dislodged by the movement. RAIB published a safety digest regarding this incident (safety digest 05/2026) which identified that the driver became distracted by the presence of an unauthorised individual in the cab. This distraction probably caused the driver to miss the information provided by the signalling system indicating the train's abnormal routing when departing from Grantham.

Further south on the East Coast Main Line is Cambridge Junction, which is close to Hitchin station. On 11 December 2025, a train travelling north from London to Cambridge passed through a junction at 56 mph (90 km/h). The permissible speed for this junction was 25 mph (40 km/h). There were no reported injuries. RAIB published a safety digest regarding this incident (safety digest 02/2026) which identified that the driver did not react appropriately to the signal indication they had received on approach to Cambridge Junction. Due to service disruption, the train was routed in an abnormal way. With parallels to the incidents at Spital Junction and Grantham, the driver's awareness of the signal conditions that could be presented on approach to this junction and their training were not sufficient to overcome the driver's expectation of how the train was to be routed.

Communication

It is necessary on some occasions to amend permissible speeds by imposing some form of reduction. It is important that, should such restrictions be imposed, train drivers are made aware of them. Blanket speed restrictions (BSRs) can cover significant lengths of a route. They are usually imposed due to risk from external factors, such as heavy rain, high winds or high ambient temperatures. BSRs are not indicated by lineside signage, but are communicated to train drivers through a combination of issued notices, broadcasts by the GSM-R radio system or by communications with signallers. As with other restrictions, these communications need to be effective to avoid risk.

Forecast heavy rain led to a BSR of 40 mph (64 km/h) being imposed between Laurencekirk and Portlethen on 4 December 2020. However, this was not effectively communicated to train drivers. In some instances, trains travelling through the BSR reached the normal maximum permissible speeds which varied along this length of line up to 100 mph (161 km/h) for the trains involved. No accident or other adverse consequence resulted. RAIB's investigation (report 08/2021) found that some drivers were unaware of the BSR as they approached it, and others were unaware of its exact extent. A notice, displayed in the late notice cases at the locations where the drivers reported for duty, was the only information about the BSR provided to drivers. This notice did not convey information in a way that could be readily understood and remembered when drivers needed to apply it. The train operator had not recognised that use of the late notice case was an unreliable way to implement BSRs.

Hot weather led to various BSRs being imposed on locations within Network Rail's Wales & Western route on 18 and 19 July 2022. Four incidents came to RAIB's notice of trains exceeding the BSR. In one case, a train travelled at up to 125 mph (201 km/h) in a 60 mph (97 km/h) BSR. Again, no adverse consequences occurred. RAIB's safety digest (safety digest 06/2022) identified that these overspeeding incidents occurred because the drivers of the trains involved did not have a clear understanding of where, or when, the relevant BSR applied. In one case, a driver's incorrect understanding of the extent of a BSR was reinforced by a signaller, who also did not have the correct understanding of its application.

On the morning of 14 July 2023, Network Rail issued a BSR between Blackford signal box (at the south end of the BSR) and Gleneagles station (to the north). This BSR imposed a temporary maximum permissible speed of 40 mph (65 km/h) from 04:00 to 19:00 on 15 July. The normal maximum permissible speed between these locations was 90 mph (145 km/h). Three trains, operated by two different companies, passed through the section without reducing speed. A fourth train, operated by a third company, was stopped and cautioned by a signaller; the driver was unaware of the BSR. The driver of a fifth train was similarly unaware. RAIB's safety digest (safety digest 06/2023) reported that the drivers were unaware of the restriction because they had not been provided with the necessary information when they booked on for duty. This was due to various communication issues which had arisen, both between Network Rail and the train operators, and within the operators' own processes.

On 27 January 2025, BSRs of 50 mph (80 km/h) were imposed between Swansea and Neath, and Newport and Bishton, due to forecast high winds and potential risk from fallen trees. Eight trains, operated by three different companies, were subsequently identified as having exceeded the restrictions. Three of the trains travelled through a restricted area at 90 mph (145 km/h) or above. RAIB's safety digest (safety digest 03/2025) reported that the drivers involved had varying levels of understanding of the speed restrictions, and that signallers were unaware of it. When drivers checked with signallers regarding the restrictions, they received incorrect information. Because lineside equipment is not used for such BSRs, it was critical that signallers were able to provide the correct information to the drivers.

Temporary or emergency permissible speed restrictions (TSRs or ESRs) cover specific locations and are usually imposed due to some degradation in the condition of an asset. Drivers may be advised of such restrictions before starting a journey, but it is sometimes necessary to impose a restriction at very short notice. In such circumstances, lineside equipment is used to inform drivers. Issues identified by RAIB have included Network Rail not conveying this information to train operating companies, train operating companies not conveying this information to drivers, and drivers not receiving or understanding notices of restrictions. As a result, there have been occasions when such speed restrictions have been exceeded by significant margins.

At Queen's Park (north London) on 5 January 2016, a driver manager who was being assessed by another driver manager travelled through a 5 mph (8 km/h) ESR at 75 mph. During its investigation (report 19/2016), RAIB found that the driver manager who was being assessed did not slow the train for the emergency speed restriction due to misunderstanding details of the restriction given in an email.

Location of the incident at Queen's Park.

On 19 July 2016, six trains passed through an ESR between East Somerset Junction and Blatchbridge Junction at excessive speed. One train passed through a 20 mph (32 km/h) ESR at 86 mph (138 km/h); another passed through at 93 mph (150 km/h). RAIB's safety digest (safety digest 06/2016) reported that train drivers were not warned of the imposition of these ESRs due to communication issues between staff monitoring rail temperatures at site and the controlling signaller. The digest also noted that there were issues with the provision and erection of the correct lineside signage.

On 19 October 2018, a train traversed a section of track at Sandy South Junction, where an ESR of 20 mph (32 km/h) was in place, at approximately 121 mph (195 km/h). RAIB's investigation (report 10/2019) found that the emergency speed restriction had been put in place at around 14:00 during the previous afternoon. The driver was not aware before starting the journey that there were any emergency speed restrictions in place on the route. Although Network Rail had sent out a notice to all the affected train and freight operating companies to inform them that the ESR was in place, the train operator's control centre did not pass this message on to its drivers. Temporary signage was in place, but the driver became distracted and did not reduce the speed of the train in response to the audible and visual warnings that they received.

Incorrect signage

The provision of temporary lineside signage of the correct type and in the correct location is a critical element of advising drivers where restrictions have been imposed. A design process is required to ensure that drivers are given sufficient warning such that they can reduce speed within the braking capabilities of their trains. Other factors, such as pre-existing restrictions, complex track layouts and gradients may add to the complexity of this task.

On 19 December 2020, heavy rain led to a closure of the West Coast Main Line near to Beattock. After remedial work, the railway reopened with a 5 mph (8 km/h) ESR in place. A passenger train passed through this section at about 45 mph (72 km/h), with no injuries or damage resulting. Lineside signage had been put in place, and this had removed the need for signallers to caution each train passing the location. RAIB's safety digest (safety digest 02/2021) reported that the distance between the ESR's warning board and its start was too short for trains that could approach the ESR at 125 mph (201 km/h). The work to calculate the locations for the various temporary ESR signs had not accounted for the significant falling gradient on the railway approaching the location.

Forward-facing CCTV showing the speed indicator at the start of the ESR near Beattock.

Hot weather led to the placing of various ESRs during the summer of 2023. On 11 June 2023, a 20 mph (32 km/h) ESR was imposed at Wood Green, north London. At least four passenger trains exceeded the ESR, with one train passing through at 94 mph (151 km/h). On 12 June 2023, a 20 mph (32 km/h) ESR was imposed at Melton Lane level crossing, East Yorkshire. At least one passenger train exceeded the ESR, passing through at 65 mph (105 km/h). There were no adverse outcomes from any of these overspeeding incidents. RAIB's safety digest (safety digest 05/2023) advised that these incidents occurred because the drivers of the trains involved did not realise that the ESRs applied to their trains. This was because equipment already installed on the track which related to earlier speed restrictions had been adapted to warn drivers about these ESRs

Other causes

RAIB's investigation into the loss of safety-critical signalling data on the Cambrian Coast line (report 17/2019) showed that overspeeding remains a risk even on routes with a modern ERTMS system utilising speed-signalling principles. On 20 October 2017, four trains travelled over the Cambrian Coast line while TSR data was not being sent to the trains by the signalling system. No accident resulted, but a train approached a level crossing at 80 km/h (50 mph), significantly exceeding the temporary speed restriction of 30 km/h (19 mph) needed to give adequate warning time for level crossing users. The investigation found that the temporary speed restriction data was not uploaded during an automated signalling computer restart the previous evening.

Rail industry's strategic safety groups

The Train Accident Risk Group (TARG) is a rail industry working group facilitated by the Rail Safety and Standards Board (RSSB). TARG seeks to look at the whole system risk of accidents and incidents including overspeeding but also other operational irregularities such as signals passed at danger (SPADs), station overruns, and train fires.

Working under TARG is the Overspeed Sub-Group (OSG). OSG focuses specifically on the management and understanding of the overspeed risk. It is responsible for the production of an industry-wide strategy to improve the processes to reduce the risk of trains overspeeding.

Relevant RAIB publications

- Overspeed incident at Fletton Junction, Peterborough, 11 September 2015 (report 14/2016)
- Overspeed incident at Queen's Park, 5 January 2016 (report 19/2016)
- Overspeed incidents, Somerset, 19 July 2016 (safety digest 06/2016)
- Loss of safety critical signalling data on the Cambrian Coast line, 20 October 2017 (report 17/2019)
- Overspeed at Sandy South Junction, Bedfordshire, 19 October 2018 (report 10/2019)
- Overspeeding between Laurencekirk and Portlethen, Aberdeenshire, 4 December 2020 (report 08/2021)
- Overspeed through an emergency speed restriction near Beattock, Dumfries and Galloway, 20 December 2020 (safety digest 02/2021)
- Overspeeds in weather-related blanket emergency speed restrictions on Western and Wales routes, 18 and 19 July 2022 (safety digest 06/2022)
- Overspeeding incidents at Wood Green, and Melton Lane level crossing, 11 and 12 June 2023 (safety digest 05/2023)
- Trains overspeeding between Blackford and Gleneagles, Perth and Kinross, 15 July 2023 (safety digest 06/2023)
- Overspeeds in blanket speed restrictions, south Wales, 27 January 2025 (safety digest 03/2025)
- Train overspeeding at Spital Junction, Peterborough, 17 April 2022 (report 06/2023)
- Overspeed at Spital Junction, Peterborough, 4 May 2023 (report 10/2024)
- Overspeeding near Manor Park, 24 September 2024 (safety digest 01/2025)
- Overspeeding at Cambridge Junction, 11 December 2025 (safety digest 02/2026).
- Overspeeding at Grantham South Junction, 26 September 2025 (safety digest 05/2026)