RAIB

Rail Accident Investigation Branch

Rail Accident Report

Overspeed at Queen's Park, London
5 January 2016

Report 19/2016
October 2016

This investigation was carried out in accordance with:

- the Railway Safety Directive 2004/49/EC;
- the Railways and Transport Safety Act 2003; and
- the Railways (Accident Investigation and Reporting) Regulations 2005.

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Preface

The purpose of a Rail Accident Investigation Branch (RAIB) investigation is to improve railway safety by preventing future railway accidents or by mitigating their consequences. It is not the purpose of such an investigation to establish blame or liability. Accordingly, it is inappropriate that RAIB reports should be used to assign fault or blame, or determine liability, since neither the investigation nor the reporting process has been undertaken for that purpose.

The RAIB's findings are based on its own evaluation of the evidence that was available at the time of the investigation and are intended to explain what happened, and why, in a fair and unbiased manner.

Where the RAIB has described a factor as being linked to cause and the term is unqualified, this means that the RAIB has satisfied itself that the evidence supports both the presence of the factor and its direct relevance to the causation of the accident. However, where the RAIB is less confident about the existence of a factor, or its role in the causation of the accident, the RAIB will qualify its findings by use of the words 'probable' or 'possible', as appropriate. Where there is more than one potential explanation the RAIB may describe one factor as being 'more' or 'less' likely than the other.

In some cases factors are described as 'underlying'. Such factors are also relevant to the causation of the accident but are associated with the underlying management arrangements or organisational issues (such as working culture). Where necessary, the words 'probable' or 'possible' can also be used to qualify 'underlying factor'.

Use of the word 'probable' means that, although it is considered highly likely that the factor applied, some small element of uncertainty remains. Use of the word 'possible' means that, although there is some evidence that supports this factor, there remains a more significant degree of uncertainty.

An 'observation' is a safety issue discovered as part of the investigation that is not considered to be causal or underlying to the event being investigated, but does deserve scrutiny because of a perceived potential for safety learning.

The above terms are intended to assist readers' interpretation of the report, and to provide suitable explanations where uncertainty remains. The report should therefore be interpreted as the view of the RAIB, expressed with the sole purpose of improving railway safety.

The RAIB's investigation (including its scope, methods, conclusions and recommendations) is independent of any inquest or fatal accident inquiry, and all other investigations, including those carried out by the safety authority, police or railway industry.

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Overspeed at Queen's Park, London 5 January 2016

Contents

Summary

At 08:28 hrs on 5 January 2016, a London Midland train estimated to be carrying around 2000 passengers travelled at 75 mph (121 km/h) through a 5 mph (8 km/h) emergency speed restriction at Queen's Park in north-west London. The train was the 07:39 hrs service from Bletchley to London Euston and was being driven by a driver manager who was being assessed by another driver manager. The emergency speed restriction had been imposed due to a track defect. There were no injuries, no further damage to the infrastructure and no damage to the train which continued its journey to Euston.

The driver manager who was being assessed did not slow the train for the emergency speed restriction as he had misunderstood details of the restriction given in an email. Details of the restriction were also given on a notice displayed at his booking-on point, and lineside warnings were provided on the approach to the restriction. These did not correct the driver's misunderstanding. The assessing driver manager's knowledge of the emergency speed restriction was insufficient to notice the driver's error.

The RAIB has made three recommendations to London Midland seeking to improve the ongoing training of driver managers, improve the communication of safety critical information and to implement a means of quickly identifying the driver of any train. The RAIB has also identified three learning points concerning the importance of managers fully preparing before driving trains, the need for driving assessors to prepare as if they were driving the train and the use of unambiguous words in safety communications.

Introduction

Key definitions

1 Metric units are used in this report, except when it is normal railway practice to give speeds and locations in imperial units. Where appropriate the equivalent metric value is also given.

2 The report contains abbreviations and technical terms (shown in *italics* the first time they appear in the report). These are explained in appendices A and B. Sources of evidence used in the investigation are listed in appendix C.

The incident

Summary of the incident

3 At 08:28 hrs on 5 January 2016, a London Midland passenger train travelled at 75 mph (121 km/h) over a 5 mph (8 km/h) *emergency speed restriction* (ESR) immediately east of Queens Park station in north-west London (figure 1).

4 The train was the 07:39 hrs service London Midland service from Bletchley to London Euston. It was being driven by a *driver manager* who had recently joined London Midland and who was being assessed by another driver manager. Neither driver manager was aware of the overspeeding event until they arrived at Euston.

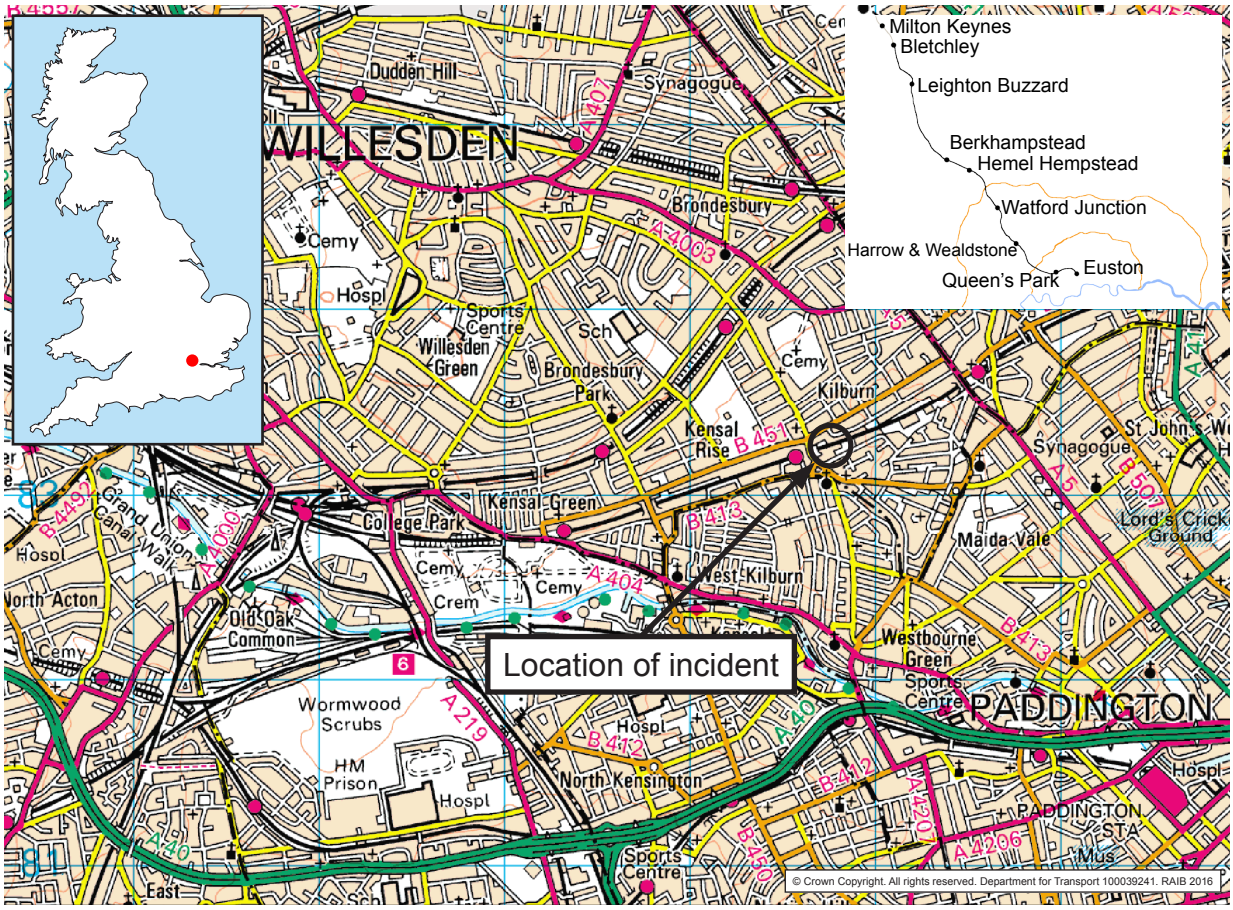


Figure 1: Incident location (inset: route map from Bletchley to London, outline of River Thames, North circular Road and M25)

5 The incident occurred on the up slow line at a set of *points* giving access to the Kilburn up and down goods loop (figure 2). The maximum speed normally permitted on the up slow line at this location was 75 mph (121 km/h). However, on the previous night, an emergency speed restriction had been imposed due to the discovery of a crack in part of the set of points.

6 There were no injuries, no damage to the train and no further damage to the infrastructure.

7 The train was estimated to have been carrying about 2000 passengers (the average loading for this service as reported by London Midland); as such the incident had the potential to be very serious.

Context

Location

8 The incident occurred at 3 miles and 48 *chains* from London Euston station, approximately 110 metres to the east of Queen's Park station.

9 At this location there are eight *running lines*, two *sidings,* and one *goods loop* running parallel to each other. Four of the running lines, including the up slow line and the goods loop, form part of the West Coast Main Line (figure 2). Two of the other tracks serve London Overground and the remaining lines serve London Underground's Bakerloo line. The Kilburn up and down goods loop starts to the east of Queen's Park station and runs alongside the up slow line. It is linked to the up slow line by a *crossover* at each end.

10 The maximum permitted speed for trains running through this area on the up slow line is 75 mph (121 km/h). Trains going into and along the loop are restricted to 15 mph (24 km/h).

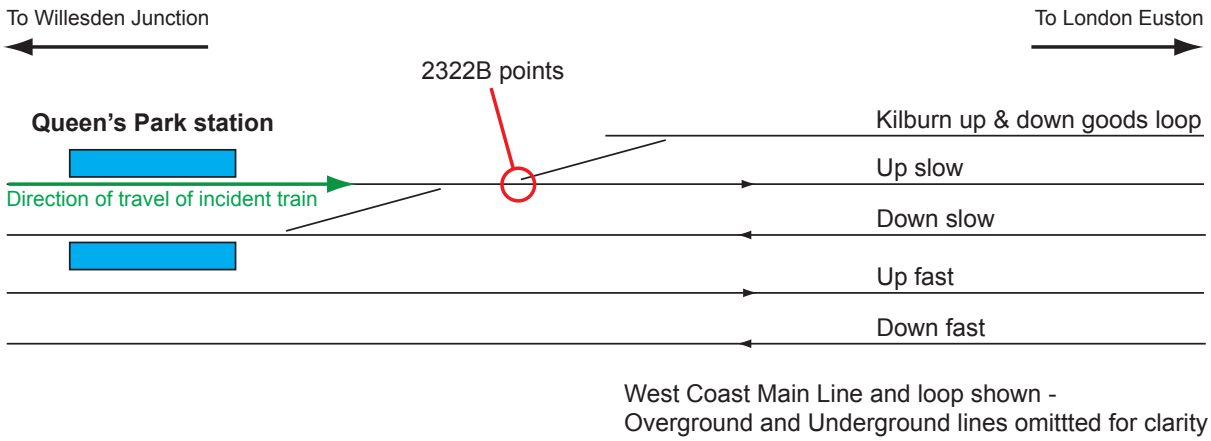


Figure 2: Track layout

Organisations involved

11 London Midland (a trading name of London & Birmingham Railway Ltd, a wholly owned subsidiary of Govia Ltd) operated the train involved in the incident and employed both of the driver managers involved, the platform staff who spoke to the driver at Euston and the rostered driver.

12 Network Rail owns and maintains the West Coast Main Line at this location. It also employs the signaller and track maintenance staff.

13 London Midland and Network Rail freely co-operated with the investigation.

Train involved

14 The train involved in the incident was formed of three four-coach class 350 units, with unit number 350264 at the front followed by unit numbers 350256 and 350115.

15 Class 350 trains are *electric multiple units*, known as 'Desiros'[1] and powered from 25 kV overhead lines.

Equipment and facilities involved

16 The incident occurred at points number 2322B which have *inclined*, *flat bottom CEN60* rails with *'C' switch* length. These are on the up slow line and give access to the western end of Kilburn up and down goods loop (figure 3). The points included a *crossing*, a component needed to allow the passage of wheel flanges across other rails where tracks intersect (figure 4).

17 London Midland's Bletchley train crew and driver managers are based in facilities at Bletchley station. These facilities include an office shared by the driver managers and the train crew booking-on point, housing the *late notice case.*

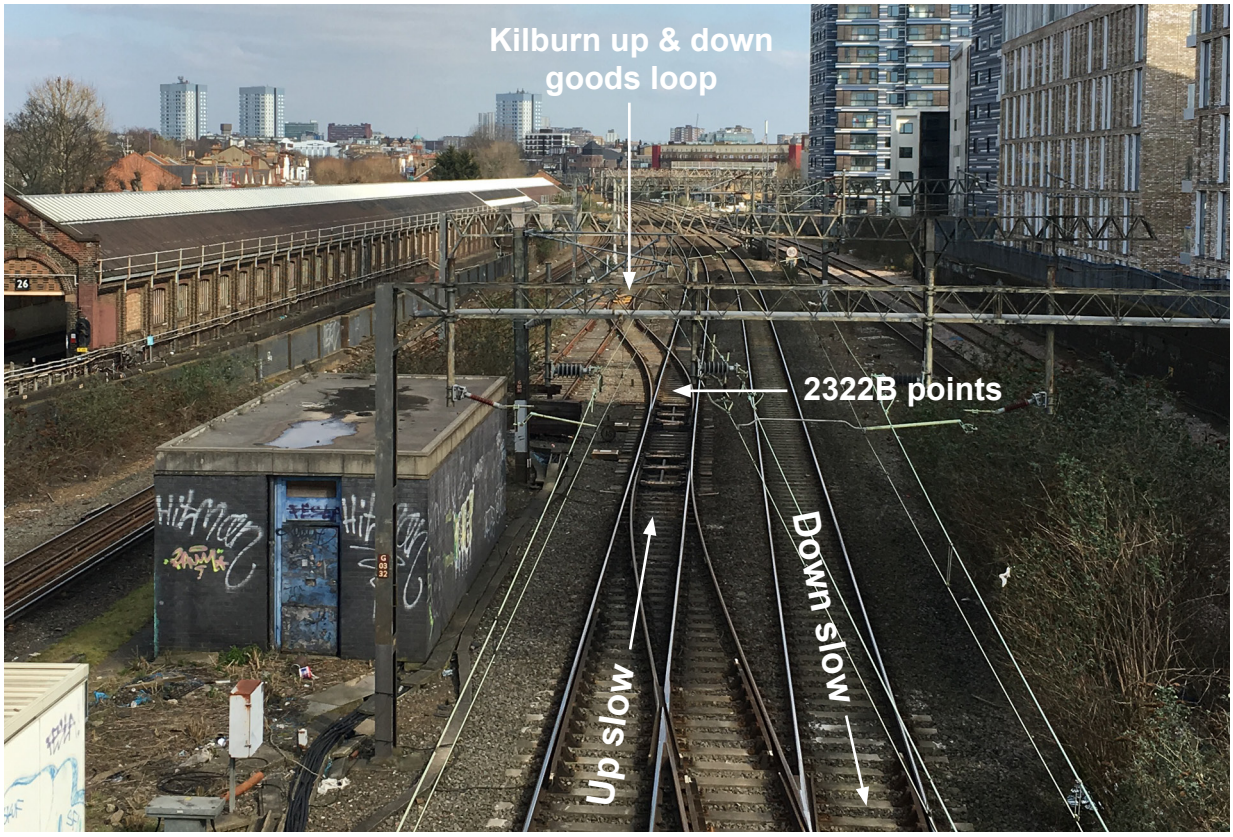


Figure 3: Incident location

Staff involved

18 The driver manager whose driving was being assessed (designated 'the driver' in this report) had been a train driver for 10 years with other train operating companies. He joined London Midland in June 2015 as a driver manager and would have been responsible for managing a group of train drivers based at Bletchley, once his initial training was complete. He was familiar with the incident location from his previous employment, typically having driven over this part of the line three or four times a month since 2011. He had had no previous safety related incidents with London Midland and only one in previous employments, a station over-run caused by a train fault.

[1] Siemens Desiro trains include classes 185, 350, 360, 380, 444 and 450.

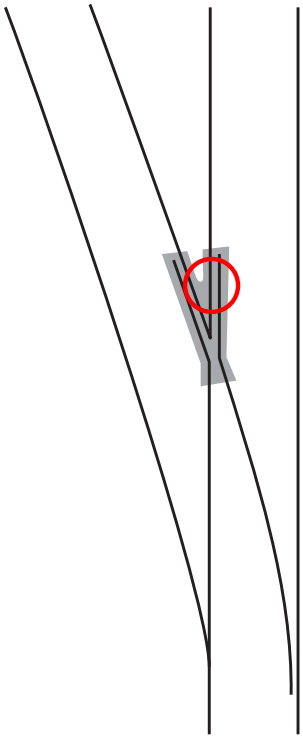


Figure 4: Defect at 2322B points

19 The driver manager who was conducting the assessment (designated 'the assessor' in this report) had 30 years' experience driving trains, comprising five as a second man, then fifteen as a driver, before becoming a driver manager in 2006. He joined London Midland in 2009 and had been based at Bletchley since then. During his time with London Midland he had no record of previous relevant safety incidents.

20 The rostered driver was due to drive the 07:39 hrs service from Bletchley on the day of the incident.

21 The *duty train crew manager* (DTCM) at Bletchley was responsible for maintaining the notice boards and briefing drivers at Bletchley. Shift arrangements meant that the person undertaking this role on the day of the incident changed at 07:00 hrs.

22 The London Midland *duty control manager* was responsible for making decisions relating to the day to day running of London Midland's operations, and managing the incident once it was reported to them.

External circumstances

23 The morning of 5 January 2016 was cold and dry. There had been some mist earlier in the journey, but it was clear in the Queen's Park area. Sunrise was at 08:06 hrs and at the time of the incident the sun was at an angle of 2 degrees above the horizon[2] so was most likely still hidden by the urban landscape. The RAIB has no evidence that the environmental conditions were a factor in the incident.

[2] Sunrise time and position data from www.timeanddate.com.

The sequence of events

Events preceding the incident

24 The driver moved from another passenger train operating company, where he was a train driver, to become a driver manager at London Midland on 1 June 2015. London Midland's competency management system required newly appointed driver managers from outside the company to demonstrate competence as a driver before undertaking driver manager training.

25 The driver completed an initial period of training and was deemed competent to drive class 350 trains over the route from London Euston to Northampton on 25 September 2015. He was due to have a further *formal driving assessment* within three months to complete the driver competency training.

26 On the morning of 24 December 2015, while preparing for a meeting with the London Midland *operations standards manager*, the driver realised that a formal driving assessment was due by 25 December 2015 in order to complete his driver competence training. During the meeting, on the afternoon of the same day, the operations standards manager confirmed that the driver should undertake this formal driving assessment. The driver had annual leave booked from 25 December 2015 until 3 January 2016 so it was agreed that he would complete the assessment as soon as possible after his return to work.

27 The last scheduled basic visual inspection[3] of 2322B points before the incident was on 31 December 2015. The resulting report recorded no defects which required maintenance.

28 Both driver managers returned from leave on 4 January 2016 and arranged the driver's formal driving assessment for the following day.

Events during the incident

29 In the early hours of 5 January 2016, a Network Rail permanent way team, inspecting the *plain line* in the Queen's Park area, noticed a crack in the crossing of 2322B points. This was reported to Network Rail control at 03:10 hrs. The track maintenance staff arranged for a *dye penetrant inspection* to be carried out and for an emergency speed restriction to be applied in accordance with Network Rail standards. They also appointed a watchman who was required to monitor the crossing's condition until the fault was repaired.

30 At 03:50 hrs, *London Midland control* notified the Bletchley DTCM by telephone that an emergency speed restriction was being imposed in the Queen's Park area. The DTCM immediately began briefing drivers as they booked on duty at Bletchley.

31 The London Midland Duty Control manager sent an email at 05:23 hrs to managers, including the Bletchley driver managers, with details of the location and cause of the emergency speed restriction at Queen's Park.

[3] In accordance with Network Rail standard NR/L2/TRK/001 'Inspection and Maintenance of Permanent Way' basic visual switch and crossing inspections were carried out weekly and sought to identify any immediate or short term actions required. These were generally faults that required action within four weeks.

32 The duty control manager sent an email at 05:27 hrs to the DTCM, copied to others including the Bletchley driver managers, including a formal notice of the emergency speed restriction. The DTCM transcribed this into the format used at Bletchley and posted it in the late notice case at 05:30 hrs.

33 While eating his breakfast, at around 05:40 hrs, the assessor checked his emails on a company issued Blackberry mobile device. He noticed the two emails from the duty control manager relating to the emergency speed restriction but did not open either message, seeing only the information in the email headers. He then travelled by train to Bletchley, arriving at 06:35 hrs and began preparing for the assessment.

34 The assessor spent a few minutes around 07:00 hrs in the booking-on point, preparing a drink and talking to the DTCM about a future assessment. He looked at the notices in the late notice case as he left to return to his office.

35 At around 07:00 hrs, the driver arrived at Bletchley and read his emails on a laptop computer in the driver managers' office. The emails included the two from the duty control manager concerning the emergency speed restriction at Queen's Park. He then went to the booking-on point where he looked at the notices in the late notice case.

36 Between 07:15 hrs and 07:20 hrs, the driver and assessor met in their office before going to meet the 07:39 hrs service to Euston. They reached platform 5 at 07:35 hrs and took charge of the train, after explaining to the rostered driver that they wished to do an assessment. The rostered driver travelled to London Euston in the passenger compartment in order to join his next train.

37 The train departed from Bletchley on time at 07:39 hrs, made five scheduled station stops and accumulated three minutes delay due to *restrictive signal* aspects. The journey to Queen's Park was uneventful and the assessor recorded that the driver was performing well.

38 At 08:28 hrs the train passed through the 5 mph (8 km/h) emergency speed restriction at Queen's Park while travelling at 75 mph (121 km/h).

39 The watchman telephoned the signaller at 08:30 hrs to report that a London Midland train had just passed him at line speed. The watchman asked the signaller to caution (ie instruct drivers to reduce speed) trains on approach to the emergency speed restriction. The signaller confirmed that he would do this.

Events following the incident

40 At 08:34 hrs, one minute after the scheduled time, the train arrived at platform 14 in London Euston station. Neither the driver nor the assessor was aware that their train had travelled too fast through the emergency speed restriction at Queen's Park.

41 The signaller advised *Network Rail control*, who in turn notified London Midland control about the incident. London Midland control then attempted to contact the driver of the train in order to stop him driving another train until London Midland managers had undertaken further investigations.

42 London Midland control were unable to contact the driver before he and the assessor left Euston to complete the assessment by driving the 08:47 hrs service to Milton Keynes. This is covered more fully in paragraphs 74 to 82.

43 The driver and assessor arrived at Milton Keynes at 09:19 hrs and then travelled as passengers to Bletchley.

Key facts and analysis

Identification of the immediate cause

44 The driver did not reduce the train's speed to comply with the emergency speed restriction.

45 The watchman reported that the train passed through the emergency speed restriction at line speed. The train's *on-train data recorder* (OTDR) showed that the train was travelling at the line speed of 75 mph (121 km/h) when passing over the 5 mph (8 km/h) emergency speed restriction at Queen's Park.

Identification of causal factors

46 The incident occurred due to a combination of the following causal factors:

a. the driver believed that the emergency speed restriction applied to a different route (paragraph 47); and

b. the assessor did not correct the driver's misunderstanding (paragraph 57).

Each of these factors is now considered in turn.

The driver's actions

47 The driver believed the emergency speed restriction applied to a different route.

48 This causal factor arose due to a combination of:

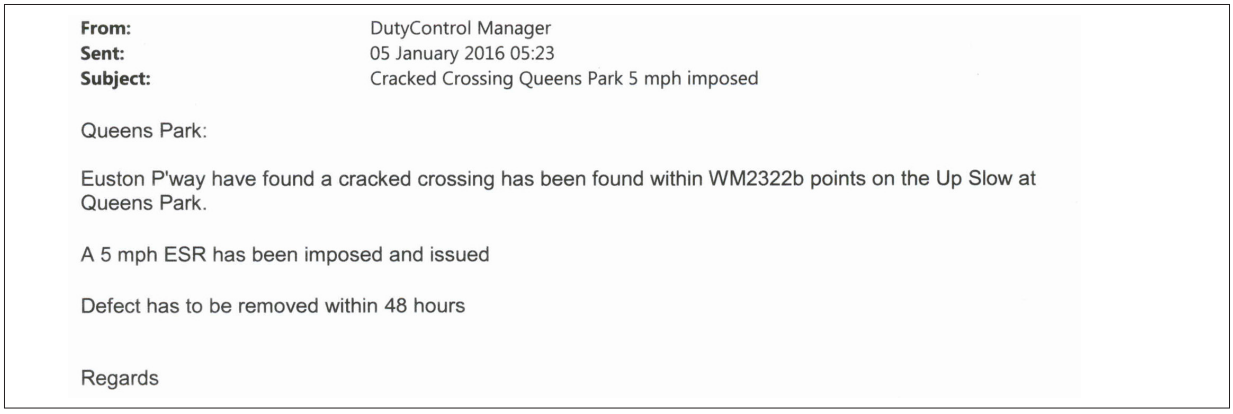
a. the driver misunderstood an email sent at 05:23 hrs by the London Midland duty control manager advising London Midland managers that a cracked crossing required a 5 mph (8 km/h) emergency speed restriction;

b. this misunderstanding was not corrected by an email sent at 05:27 hrs by the London Midland duty control manager giving London Midland managers formal notification of the emergency speed restriction;

c. a notice posted in the Bletchley late notice case did not correct the misunderstanding; and

d. the lineside signage did not correct the driver's misunderstanding.

49 The driver first learnt of the emergency speed restriction from an email sent at 05:23 hrs which he read in between arriving at Bletchley at about 07:00 hrs and going to the booking-on point. This email was intended to advise London Midland managers that a cracked crossing required a 5 mph (8 km/h) emergency speed restriction (figure 5). It had the heading 'Cracked Crossing Queens Park 5 mph imposed'. The driver understood 'crossing' to be the line linking the up slow line to the up and down goods loop. He therefore incorrectly believed that the speed restriction applied only to trains entering or leaving the loop, and not to trains passing on the up slow line.



From: DutyControl Manager
Sent: 05 January 2016 05:23
Subject: Cracked Crossing Queens Park 5 mph imposed

Queens Park:

Euston P'way have found a cracked crossing has been found within WM2322b points on the Up Slow at Queens Park.

A 5 mph ESR has been imposed and issued

Defect has to be removed within 48 hours

Regards

Figure 5: Email sent at 05:23 hrs by the London Midland duty control manager

50 Before going to the booking-on point, the driver also read the email sent at 05:27 hrs, which gave formal notification of the emergency speed restriction. This contained full details including that the 'up slow' was the affected line and gave the reason as 'cracked crossing WN2332b'[4] (figure 6). The words 'Up Slow' did not catch the driver's attention and he continued to believe that the emergency speed restriction applied to the 'crossing' leading to the goods loop and not to the up slow line.

51 After reading the emails, before meeting the assessor at about 07:15 hrs, the driver went to the booking-on point (figure 7). The driver stated that he read the notice but did not appreciate that it related to trains travelling along the up slow line, and continued to believe that the emergency speed restriction applied only to the 'crossing' leading to the goods loop and not to the up slow.

52 The notice contained a considerable amount of unnecessary information and that which was essential was not emphasised. The driver stated that it is possible that he would have realised his error if the notice layout had been clearer.

53 When approaching the emergency speed restriction the train passed over an *automatic warning system* (AWS) magnet associated with the emergency warning indicator immediately before entering Kensal Green tunnel, followed, at the exit of the tunnel (a distance of around 310 metres), by the emergency warning indicator, a yellow sign with black chevrons and two white flashing lights and AWS for the warning board. After approximately a further 150 metres, the train passed the warning board[5], a yellow sign with a black '5', surmounting a yellow sign with two reflectors[6]. There were two signals and Queen's Park station before reaching the board at the beginning of the speed restriction, signed by a yellow sign with a black '5' (figure 8). The defective crossing was about 40 metres after the start of the speed restriction and a termination board, which indicates a return to normal line speed, was located 25 metres beyond the defective crossing.

[4] The points were actually numbered 2322B but there is no evidence that this reference to 2332B was a factor in the incident.

[5] The distances of 310 metres and 150 metres differed from the value of 180 metres, given in standard GK/RT0075 (Lineside Signal Spacing and Speed Signage) and Module SP of the Rule Book (GE/RT8000/SP) for both distances, possibly because Kensal Green tunnel limited lineside access for staff placing the signs. It is highly unlikely that the differences were a factor in the incident.

[6] This sign was intended for use in areas of limited clearance and had a narrower lower part with closer reflectors (90 mm separation rather than the 130 mm) than provided on a sign intended for use where there is sufficient space (Railway Group Standard GI/GN7634, Index for Lineside Signs, Diagram AF02m). It is highly unlikely that this difference was a factor in the incident.

From: DutyControl Manager
Sent: Tuesday, January 05, 2016 05:27 AM
To:
Subject: LM002 Queens Park (ESR 151 Imposed)

All,

And with ESR attached….

Regards

NOTICE TO TRAIN CREWS
EMERGENCY SPEED RESTRICTION

IMPOSED

Depot*		Date/Time:	05/01/16 @ 04:45
Route:	MD101 Euston to Armitage		

THE FOLLOWING EMERGENCY SPEED RESTRICTION HAS BEEN IMPOSED FORTHWITH AND UNTIL FURTHER NOTICE THE SPEED OF ALL TRAINS BETWEEN THE POINTS BELOW MUST NOT EXCEED: -

5(Five)
MPH

Has this speed been imposed as a result of severe or adverse weather conditions? No

Line:	Up Slow
At or between:	Queens Park
Mileage	3 miles 48 chains and 3 miles 46 chains
Reason:	Cracked Crossing WN2332b
Comment:	All boards in position
ESR / TSR speed board owner.	

Network Rail		**LM Ref**	**002**
Signed		* Signed	
Position	Route Control Manager	* Position	
Network Rail Ref:	MW2016/151	* Date Posted	
Trust Delay Incident No:		* Time Posted	
FMS No:	714957	* Date and time withdrawn from the late notice case	
CCIL Ref:	1362853		

* To be completed by recipient

Figure 6: Email sent at 05:27 hrs by the London Midland duty control manager

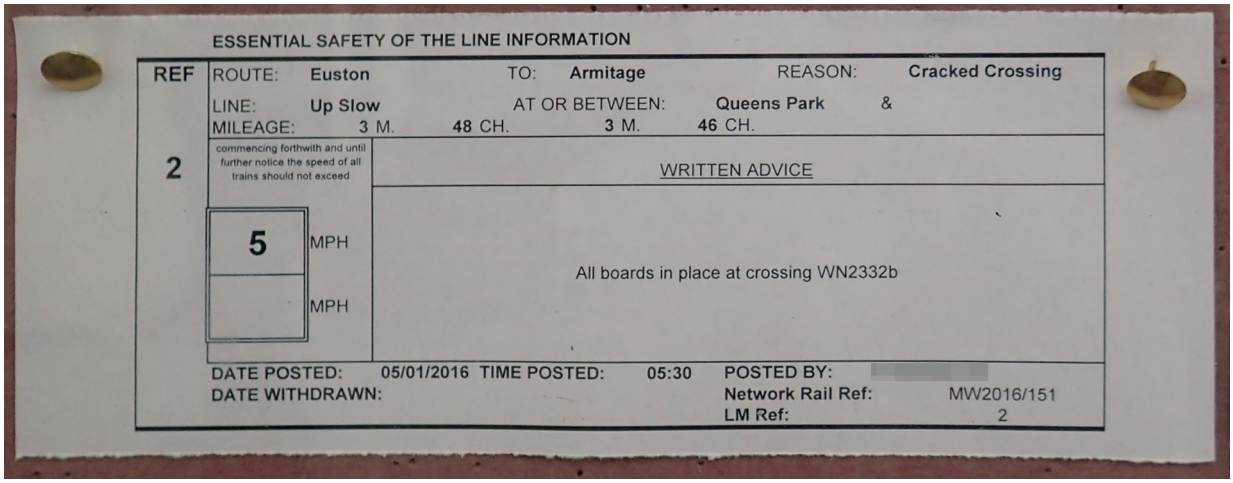


Figure 7: Notice posted in Bletchley late notice case

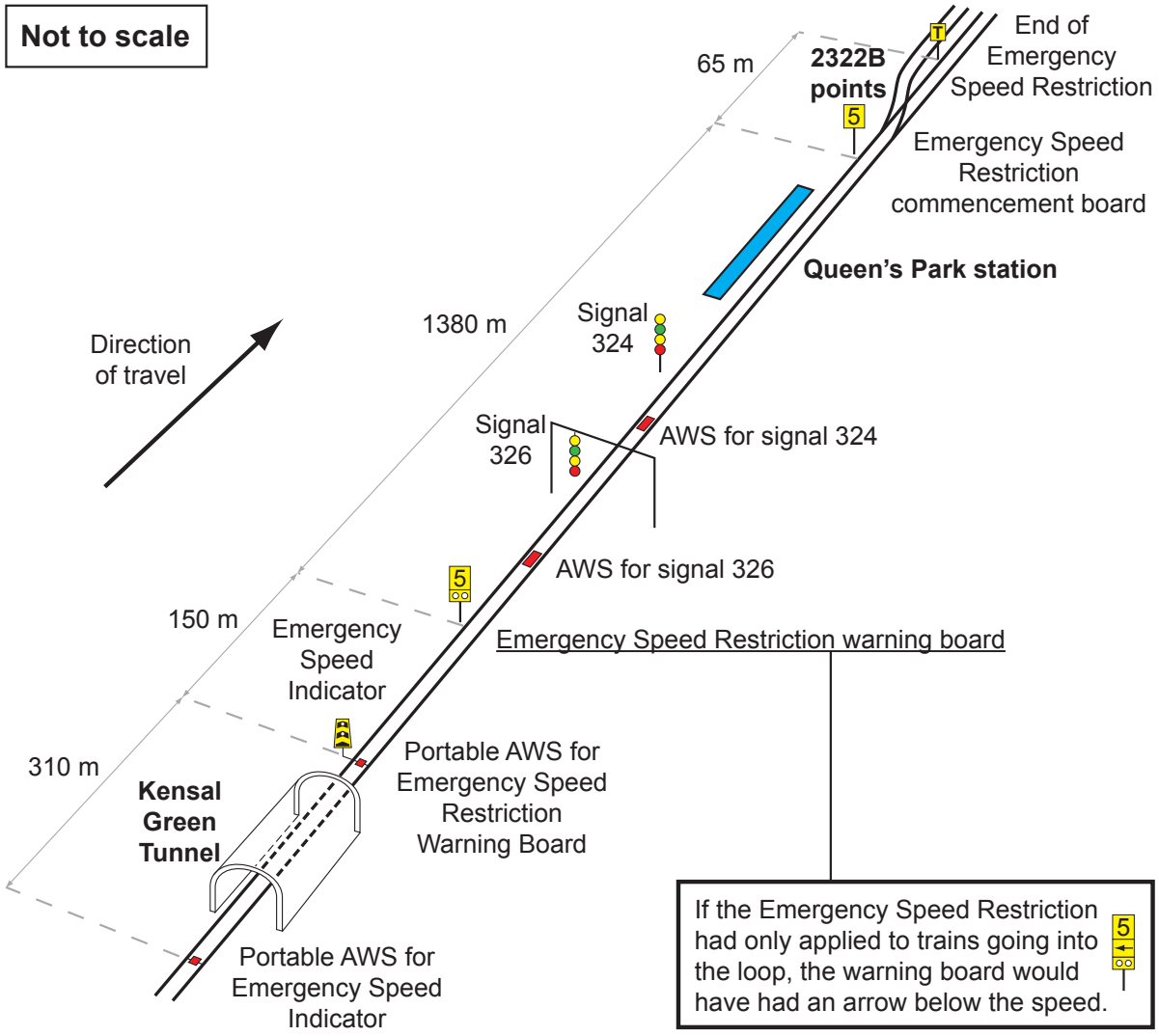


Figure 8: Layout of signs at Queen's Park

54 The lineside signage did not correct the driver's misunderstanding as he was already convinced that the emergency speed restriction did not apply to his train. The driver recalled being able to see the emergency warning indicator before reaching the AWS magnet at the entrance to Kensal Green tunnel and that this indicator remained visible until his train passed it. He does not recall seeing any of the other emergency speed restriction signs.

55 If the emergency speed restriction had applied only to trains going into the loop, there would have been an arrow pointing left below the speed value on the warning and speed indicator boards (figure 8). There were no arrows on these boards. The driver has stated he understood the significance of arrows in this context.

56 The OTDR shows that the driver acknowledged the two AWS warnings associated with the emergency speed restriction and applied the brakes for a short time after the second warning. The driver has stated that he applied the brakes because either:

- he was considering whether the emergency speed restriction applied to his train; or
- he understood that he was approaching a signal displaying a restrictive aspect.

The first of these scenarios is consistent with his actions when receiving some AWS warnings earlier in the journey. The driver explained that the second scenario could have caused him to be looking for a signal on a gantry several metres above rail height rather than the speed restriction board, within one metre of rail height.

The assessor's actions

57 The assessor did not intervene to correct the driver's misunderstanding.

58 This causal factor arose due to a combination of:

a. the assessor had received the same emails from the duty control manager as the driver, but only read the headings;

b. the assessor saw the notification of the emergency speed restriction in the late notice case, but did not give it proper attention;

c. when he questioned the driver, the assessor accepted the driver's explanation of the emergency speed restriction's location; and

d. the assessor was probably unaware of the emergency speed restriction warnings.

59 The assessor first became aware of the emergency speed restrictions when he read the headings of the two emails while he was having breakfast at home (paragraph 33). The headings (figure 9) made the assessor aware that a speed restriction had been introduced and its approximate location. The headings did not identify the line affected or the precise location, so did not contain enough information to brief him should he have been driving a train.

60 The assessor has stated that he glanced at the notice relating to the emergency speed restriction when looking at the late notice case (paragraph 34). His subsequent actions show that he did not study the notice in sufficient detail to recall its contents later.

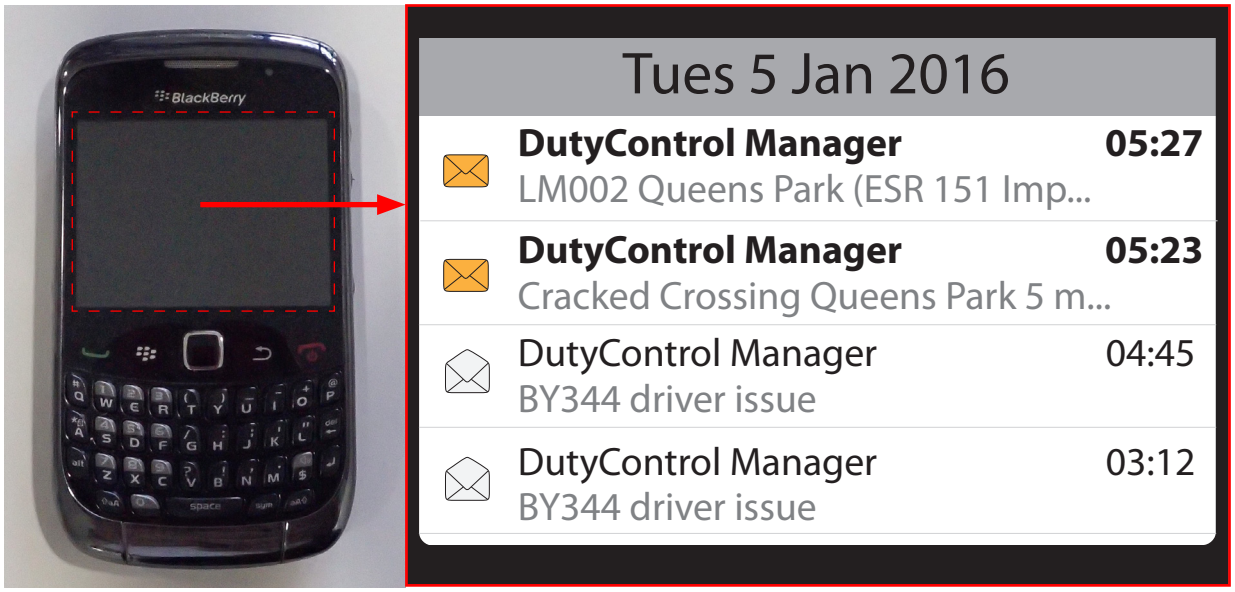


Figure 9: Email headers on Blackberry™ screen

61 The assessor and London Midland management have stated that an assessor should prepare for an assessment in accordance with the requirements for a regular driver. The assessor reported that the standard of his preparation for this peer-to-peer assessment was the same as it would be for assessing any driver.

62 After taking over the train in Bletchley station, the assessor asked the driver some questions about the route as they prepared the train for departure. One of the questions he asked was whether any temporary or emergency speed restrictions applied to this journey. The driver's answer was given very confidently. He described a long standing temporary speed restriction in the Wembley area and the new emergency speed restriction at Queen's Park which he said only applied to trains using the Kilburn goods loop.

63 The assessor stated that he had no reason to question the driver's response. The assessor's limited understanding of the emergency speed restriction was not sufficient for him to know that it applied to trains travelling along the up slow line.

64 During the early part of the journey from Bletchley, the assessor was unable to take notes of the assessment as it was still dark. However, in common with most assessors at London Midland, the assessor was accustomed to taking 'live notes' during an assessment so that the driver could sign the notes at the end of the journey. This complied with a London Midland requirement for the drivers to sign the completed notes.

65 The assessor stated that increasing daylight meant that he started making notes about the early part of the journey about three minutes before the train reached the emergency speed restriction and continued to do so for around five minutes. He explained that he did not pay attention to the driving of the train during this period because he had confidence in the driver as the journey had gone well up until that point and he had assessed the driver before. During this period, the train passed the AWS warnings and all of the boards associated with the emergency speed restriction (paragraph 53). The assessor stated that he did not recall hearing any of the AWS warnings or seeing any of the boards. However, other driver managers have stated that when making notes they would be likely to look up on hearing AWS warnings. They also stated that they were also likely to look up if the train brakes were applied as happened after the second AWS warning (paragraph 56).

66 Although not explicitly stated in the company's standards, the assessor was aware of London Midland's expectation that a driver and an assessor are both responsible for the safety of the train.

Identification of underlying factors

Shortcomings in management processes

67 **The management processes for maintaining driver managers' driving and assessing competencies were inadequate.**

68 At London Midland, it is normal practice for driver managers' practical driving assessments to be carried out by peers based in the same location. This is because there is very little overlap in the routes that driver managers from each area are competent to drive. Such peer-to-peer assessment introduces the risk of assessments becoming less rigorous, due to familiarity, and the risk of local habits developing. There is no benchmarking between areas, nor are any driving assessments carried out by the corporate driving standards department.

69 London Midland relies on the assessment training undertaken by driver managers as part of their National Vocational Training assessor qualification at the start of their assessing career. London Midland did not provide any refresher training in this discipline. The guidance in *RSSB* publication RS/100[7] and the Office of Rail and Road (ORR) publication RSP1[8] includes guidance to 'train and periodically reassess the competence of managers who carry out assessments and verifications'.

70 Driver managers are required to retain both route knowledge and driving skills. London Midland processes allow route knowledge to be refreshed while carrying out assessments of other drivers. The processes do not include any minimum train driving requirement. Studies[9] conclude that skills, including ones such as driving, decay over time if they are not regularly practised.

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[7] RSSB publication RS/100 'Good practice guide on competence development'', 2008.

[8] ORR RSP1 ORR publication RSP1 'Developing and maintaining staff competence', 2007.

[9] Factors That Influence Skill Decay and Retention: A Quantitative Review and Analysis, Winfred Arthur, Jr. et al. 1998. http://www.owlnet.rice.edu/~ajv2/courses/12a_psyc630001/Arthur,%20Bennett,%20Stanush,%20&%20McNelly%20(1998)%20HP.pdf.

71 The driving assessment process for regular drivers is more rigorous than for driver managers because it includes a regular review of OTDR downloads. There is no London Midland process for reviewing OTDR downloads relating to driver managers as they are not required to undertake any regular driving duties.

72 While training, London Midland driver managers learn some of their role by shadowing an experienced on call driver manager. Management processes do not include provision for learning activities that do not occur during this shadowing.

73 The training needs analysis devised for the incident train driver when he joined London Midland as a driver manager, did not address issues arising from his promotion from a position where he had no management responsibilities. As a driver in his previous employment, his work and assessments were planned in advance by others. As a driver manager at London Midland he was expected to manage assessment and competency schedules for himself and others.

Observations

Post-incident management

74 **Post-incident management did not prevent the driver and assessor driving a train immediately after the incident.**

75 London Midland's process, detailed in LM OPS 602[10], for dealing with a report of an overspeed of 11 mph (18 km/h) or greater, required London Midland control to contact the on-call driver manager. The driver manager would then arrange for the driver to be relieved at the next available stopping place, arrange for them to be interviewed and drug and alcohol tested, as well as making arrangements for a replacement driver for the train's ongoing journey.

76 At around 08:33 hrs, five minutes after the overspeed and about one minute before the train arrived at Euston, London Midland control contacted their staff at Euston to request that the driver call the signaller. Shortly after the train arrived at Euston a member of London Midland platform staff passed this request to the driver who contacted the signaller via the GSM-R radio in the driving cab at 08:35 hrs.

77 The signaller told the driver about the report that his train had not slowed for the emergency speed restriction. The driver said he did not comply with the emergency speed restriction as his understanding of the notice was that it applied to the route into the goods loop. The signaller said this was not the case and that the restriction applied to the up slow.

[10] LM OPS 602, 'Control Room Processes'. issue 1, section 8 Train exceeding maximum permissible speed – for action by DCM.

78 The driver told the assessor about the call as they walked to the 08:47 hrs Euston to Crewe service, the train on which they intended to complete the assessment. The assessor tried to open the attachment to the email, sent at 05:27 hrs by the London Midland duty control manager, which contained the details of the emergency speed restriction, but could not get it to display on his Blackberry. The driver stated that he did not know what to do and took his lead from the assessor (the driver had not completed the relevant driver manager training). The assessor has since stated that he had not realised the seriousness of the situation. It is unknown whether the assessor was aware of the amount of reported overspeed. Had he been, he should have applied the London Midland procedure (paragraph 75) and not allowed the driver to continue the assessment on the 08:47 hrs service.

79 At 08:43 hrs London Midland control contacted their staff at Euston again, to request that the rostered driver, as named on their computer system, be asked to call his DTCM. Control then called the Bletchley DTCM at 08:44 hrs to ask him to arrange a driver to cover the rest of the rostered driver's shift. Control also told him to expect that the rostered driver would call and should be asked to return to Bletchley as a passenger.

80 The rostered driver contacted the DTCM at around 08:44 hrs, and he explained that the train was driven by an assessor and a trainee. The rostered driver was then instructed to continue with his roster. At 08:45 hrs, the DTCM telephoned control and gave them the name of the assessor given to him by the rostered driver.

81 At 08:47 hrs, the driver and assessor departed Euston to complete the assessment. The driver rostered for this train travelled as a passenger. As was the case with the southbound train, neither the driver nor the assessor notified anyone else that they were in charge of this second train, as they were not required to do so.

82 While the train was travelling northwards, the on-call manager and area driver manager both attempted to call the driver and assessor, but they were unable to contact them as the driver and assessor's mobile phones were, as required by London Midland procedures, switched off because they were in the driving cab. The on-call manager and area driver manager left messages which were dealt with by the driver and assessor when they reached Milton Keynes.

Forward facing CCTV

83 **It was not possible to download the forward facing CCTV from the incident train as the system was faulty.**

84 The failure of the CCTV system on the train involved in the overspeeding incident did not cause a significant problem for this investigation as the following train's CCTV system was functioning correctly and was used to establish the positions of the emergency speed restriction signs.

85 In different circumstances, CCTV systems can provide critical evidence. For example, the RAIB was only able to establish the sequence of events during a near-miss at Hest Bank (RAIB report 08/2015) with the aid of functioning CCTV systems.

86 The lack of functioning CCTV has been identified in previous RAIB investigations and was raised in a letter sent by the RAIB to all train and freight operating companies on 27 May 2015. The letter drew operators' attention to the need for effective maintenance of CCTV cameras and associated equipment. It also requested that they should give consideration to the installation of appropriate cameras on all passenger trains and locomotives in regular service.

Previous occurrences of a similar character

87 RAIB's findings following three previous investigations into overspeeding events are described below. The causes differ from those at Queen's Park and so the associated recommendations are not relevant to this incident:

a. A train travelled at excessive speed through an emergency speed restriction at Ty Mawr Farm Crossing on 29 August 2007 (RAIB report 22/2008) because the driver of the train had forgotten about the restriction. The RAIB concluded that there was no effective means to remind the driver of the emergency speed restriction, and there was a lack of warning equipment on the approach to the emergency speed restriction.

b. A derailment at Bletchley Junction on 3 February 2012 (RAIB report 24/2012) was due to overspeeding because the train driver did not immediately observe and/or register what was displayed by a signal's route indicator. The RAIB concluded that the driver's belief that he was continuing on the up slow line, overcame the fact that the 'F' indication (for a route onto the up fast line) was clearly visible to him. The RAIB also found that the route risk assessment process had not identified an overspeeding risk at Bletchley Junction, and it was possible that the driver was distracted by personal matters outside his work.

c. A train passed through Fletton Junction at excessive speed on 11 September 2015 (RAIB report 14/2016), resulting in minor injuries to several people on the train. It is likely that the train driver had forgotten about the presence of the speed restriction because he was distracted and fatigued due to issues related to his family. Lineside signs and in-cab warnings may have contributed to him not responding appropriately as he approached the speed restriction and engineering controls did not prevent the overspeeding.

88 A train collided with a buffer stop at King's Cross on 17 September 2015 (RAIB report 15/2016). The train was being driven by a trainee driver under the supervision of a driver instructor and the driver used the wrong control when instructed to brake by the instructor. Fourteen passengers reported minor injuries. One of the recommendations from this investigation overlaps with issues raised by the Queen's Park investigation (paragraph 96).

89 There is insufficient data to establish the actual number of overspeeding incidents in the UK. This is because there is no comprehensive way to identify overspeeding. Methods of detection include;

- capture on the small proportion of OTDR data which is reviewed by managers;
- being reporting by train crew or lineside observers; and
- intervention by systems such as automatic train protection or train protection and warning system (which are recorded).

90 RSSB research[11] found an average of 39 recorded incidents per year, from 2006 until 2013, with a higher average overspeed at emergency speed restrictions than at permanent speed restrictions and temporary speed restrictions. The research surmises that this may be because the difference between the line speed on approach and the speed restriction is generally greatest for emergency speed restrictions.

91 The same RSSB research noted that:

'Speeding-related derailments have the potential to result in large numbers of casualties. For example, the accident in July 2013 at Santiago de Compostela, Spain resulted in 79 fatalities. However, such accidents are rare. It is more than 30 years since the last fatal derailment caused by speeding in Britain.'

[11] RSSB research T1044 'A review of compliance with permanent, temporary and emergency speed restrictions', December 2014.

Summary of conclusions

Immediate cause

92 The driver did not reduce the train's speed to comply with the emergency speed restriction (paragraph 44).

Causal factors

93 The causal factors were:

a. The driver believed the emergency speed restriction applied to a different route (paragraph 47). This causal factor arose due to a combination of:

- the driver misunderstood the email sent at 05:23 hrs (paragraph 49, **Recommendation 2**, **Learning point 3**);
- the driver's misunderstanding was not corrected by the email notification sent at 05:27 hrs (paragraph 50, **Recommendation 2**, **Learning point 3**);
- the driver's misunderstanding was not corrected by the late notice case (paragraph 51, **Recommendation 2**, **Learning point 3**); and
- the lineside signage did not alert the driver to his misunderstanding (paragraph 53).

b. The assessor did not intervene to correct the driver's misunderstanding (paragraph 57). This causal factor arose due to a combination of:

- the assessor did not read the email notifications before the incident (paragraph 59, **Learning point 1**);
- the assessor did not pay full attention to the late notice case (paragraph 60, **Learning point 1**);
- the assessor did not correct the driver's misunderstanding when questioning him before departure from Bletchley (paragraph 62, **Learning point 1**); and
- the assessor did not see the emergency speed restriction sign so could not intervene to slow the train (paragraph 65 **Recommendation 1**).

Underlying factors

94 An underlying factor was that the management processes for maintaining driver managers' driving and assessing competencies were inadequate (paragraph 67, **Recommendation 1**).

Additional observations

95 Although not linked to the incident on 5 January 2016 the RAIB observes that:

a. post-incident management did not prevent the driver and assessor driving a train immediately after the incident (paragraph 74, **Recommendation 3**); and

b. forward facing CCTV on the incident train was not working (paragraph 83) on the day of the incident.

Recommendations that are currently being implemented

Accident at King's Cross, RAIB report 15/2016, Recommendation 2

96 The above recommendation overlaps with the training and assessment issues identified by the Queen's Park investigation. Although directed towards instructors rather than driver managers, the methodologies used to implement this recommendation may also be applicable when implementing recommendation 1 of the present report (paragraph 100). The King's Cross recommendation is reproduced below for information but is not remade in this report.

Recommendation 2

Govia Thameslink Railway should review the selection, training and management of its driver instructors, to improve the quality of training delivered to drivers. The review should draw on the guidance in RSSB publication RS/100 'Good practice guide on competence development' and ORR publication RSP1 'Developing and maintaining staff competence', and include:…

- *the training given to driver instructors on methods of teaching, the supervision and mentoring of trainees, and development of non-technical skills; and*
- *how the competence of driver instructors is assessed, with particular reference to the ability to teach, and possible techniques for assessment, including assessment from the driving seat.*

This recommendation may also be applicable to other train operating companies.

97 This recommendation was made in August 2016 and the Office of Rail and Road has not yet reported to the RAIB on the progress of the recommendation.

Actions reported as already taken or in progress relevant to this report

Actions reported that address factors which otherwise would have resulted in a RAIB recommendation

98 London Midland has reviewed the distribution lists for notification emails, and as a result driver managers no longer receive emergency speed restriction emails such as those described in paragraphs 31 and 32.

Other reported actions

99 London Midland has reported that it is taking steps to address the following:

a. The availability of CCTV images from trains is being addressed with sub-contractors and replacement equipment is to be provided for some vehicles.

b. Briefing of the requirement for members of driving staff to advise the DTCM if they are driving trains they are not rostered to drive: a briefing was held at the June 2016 driver manager forum, which will be repeated in the October 2016 safety briefing for all operational staff.

c. Two options to address the need for driver managers to maintain a minimum number of driving hours are being considered for introduction from September 2016.

Recommendations and learning points

Recommendations

100 The following recommendations are made[12]:

1 *The intent of this recommendation is to provide an effective competency regime for London Midland managers who drive trains and assess the train driving skills of others.*

London Midland should review and improve the process for routine competence management and assessment of driver managers and other managers with train driving competencies. The review should include consideration of:

- the extent to which people of the same grade and/or from the same location should undertake assessments;
- the minimum amount of driving which driver managers should undertake, and the processes required to record and audit this activity;
- the content and frequency of the refresher training needed for maintaining the skills needed to assess train driving;
- monitoring and, where necessary, improving the conduct of assessments; and
- including an explicit statement about how responsibility for safety of the train is allocated to a driver and an assessor during an assessment.

continued

[12] Those identified in the recommendations have a general and ongoing obligation to comply with health and safety legislation, and need to take these recommendations into account in ensuring the safety of their employees and others.

Additionally, for the purposes of regulation 12(1) of the Railways (Accident Investigation and Reporting) Regulations 2005, these recommendations are addressed to the Office of Rail and Road to enable it to carry out its duties under regulation 12(2) to:

(a) ensure that recommendations are duly considered and where appropriate acted upon; and

(b) report back to RAIB details of any implementation measures, or the reasons why no implementation measures are being taken.

Copies of both the regulations and the accompanying guidance notes (paragraphs 200 to 203) can be found on RAIB's website www.gov.uk/raib.

2 *The intent of this recommendation is to ensure that safety critical information is easily and unambiguously seen in late notices and other communications.*

London Midland should review and improve the communication of safety critical information transmitted to its drivers using traditional methods (eg late notice cases) and any transmitted electronically. The review should include:

- ensuring essential safety information is prominently displayed;
- ensuring subsidiary information is differentiated from safety critical content;
- ensuring non-essential information is omitted;
- considering the use of differing fonts, differing font sizes and colours;
- considering use of maps or plans; and
- considering the introduction of a requirement for staff to acknowledge the receipt and understanding of such communications.

This recommendation may also apply to other train operators.

3 *The intent of this recommendation is to assist prompt action in response to safety related issues which require identification of the person driving a train.*

London Midland should introduce an effective means of ensuring that relevant staff (for example control room operators) can rapidly establish who is driving a train (for example when driver managers replace booked drivers).

This recommendation may also apply to other train operators.

Learning points

101 The RAIB has identified the following learning points[13]:

1 It is vital that managers with driving competencies fully familiarise themselves with all relevant safety critical information when taking charge of a train. This includes reading all parts of the formal communications used to disseminate information such as details of temporary and emergency speed restrictions.

2 When assessing train driving competencies, it is important that the assessor prepares themselves as if they were driving the train and takes care not to unintentionally confirm any misunderstandings held by the driver.

3 It is essential that unambiguous language is used when disseminating safety critical information in notices and similar communications. Words with several meanings in a railway context (eg 'crossing') should be avoided. This could be assisted by introducing standard lists of words for routine communications (eg the reasons given for imposing speed restrictions).

[13] 'Learning points' are intended to disseminate safety learning that is not covered by a recommendation. They are included in a report when the RAIB wishes to reinforce the importance of compliance with existing safety arrangements (where the RAIB has not identified management issues that justify a recommendation) and the consequences of failing to do so. They also record good practice and actions already taken by industry bodies that may have a wider application.

Appendices

Appendix A - Glossary of abbreviations and acronyms

AWS	Automatic Warning System
CCTV	Closed Circuit Television
DTCM	Duty Train Crew Manager
ESR	Emergency Speed Restriction
ORR	Office of Rail and Road
OTDR	On-Train Data Recorder
RAIB	Rail Accident Investigation Branch

Appendix B - Glossary of terms

All definitions marked with an asterisk, thus (*), have been taken from Ellis's British Railway Engineering Encyclopaedia © Iain Ellis. www.iainellis.com.

Automatic warning system	A safety system for alerting train drivers about the signal aspect or speed restriction ahead. A horn sounds in the driving cab for a red, single or double yellow signal aspect, or a warning sign for a speed restriction. A bell sounds to indicate a green signal.
C switch	The letter used to describe the length and radius of a set of points. Generally starting at A for the shortest, tightest radius and typically having the lowest turnout speed. The highest type in the UK is H.
Chain	A unit of length, being 66 feet or 22 yards (approximately 20.117 metres). There are 80 chains in one standard mile.*
CEN60	A type of flat bottomed rail having a weight of 60 kilograms per metre.
Crossing	An assembly that permits the passage of wheel flanges across other rails where tracks intersect.*
Crossover	Two sets of points connected so as to permit movements between parallel tracks.*
Driver manager	A manager responsible for assessing and maintaining the competence of train drivers. Driver managers are generally experienced drivers and retain their own driver competence.
Duty control manager	The senior member of staff on duty in a control room.
Duty train crew manager	A member of London Midland staff employed at train crew booking-on points to manage short term crew issues, manage the issue and display of notices and sign train crew on and off duty.
Dye penetrant inspection	A method of finding cracks in metal by using dyes of different colours and viscosities to show them up.*
Electric multiple units	An electric train consisting of one or more coaches, including at least one powered vehicle, with driving cabs at each end, which can be coupled to other units and operated as a single train.
Emergency speed restriction	A speed restriction which has not been published in the weekly operating notice (a document issued by each Network Rail route containing details of engineering works and speed restrictions which is published and distributed every week), or which has been implemented with different arrangements to those published.
Flat bottom rails	A rail section having a flat based rail foot.*

Formal driving assessment	An assessment of a driver's competency carried out on a one-to-one basis while driving a train. Competency is established by the driver performing the required duties under normal working conditions. The driver is encouraged to state what they are actually performing and why.
Goods loop	A loop or siding connected to a main line at both ends and intended for use by goods and freight trains.*
Inclined	A rail whose vertical axis is inclined towards the centre of the track generally at 1 in 20.*
Late notice case	The Bletchley late notice case is a notice board within a locked glass fronted display case which every driver signing on for duty must consult every time they book on. It is close to the booking on point and contains safety notices which have been published too late to appear in the weekly operating notices.
London Midland control	The London Midland office which makes decisions relating to day-to-day running of the railway.
Network Rail control	The office in each Network Rail route which makes decisions relating to day-to-day running of the railway.*
On-train data recorder	Equipment fitted on-board a traction unit which records train speed and the status of various controls and systems relating to the unit's operation. This data is recorded to a crash-proof memory and is used to analyse driver performance and train behaviour during normal operations or following an incident or accident.
Operations standards manager	A member of London Midland staff employed to develop, maintain and measure operational standards and develop the competence of assessors.
Plain line	Track that does not have any points.
Points	A track assembly designed to divert trains from one line to another.
Restrictive signal	A signal which requires a train driver to slow or stop a train.
Route indicator	A form of junction indicator which identifies to a driver by an alphanumeric notation whether the train is to take a diverging route at a junction.
RSSB	A not-for-profit company owned and funded by major stakeholders in the railway industry, and which provides support and facilitation for a wide range of cross-industry activities. The company is registered as 'Rail Safety and Standards Board', but trades as 'RSSB'.
Running lines	A track other than a siding over which running movements are made.*
Sidings	A low speed track, off the main line used for storing, loading and unloading railway vehicles.*

Appendix C - Investigation details

The RAIB used the following sources of evidence in this investigation:

- information provided by witnesses;
- information from the train's on-train data recorder (OTDR);
- closed circuit television (CCTV) recordings taken from the following train on the up slow line at Queen's Park;
- site photographs;
- TOC, NR and Railway Group standards; and
- a review of previous RAIB investigations that had relevance to this incident.

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