

Overspeed incidents, Somerset, 19 July 2016

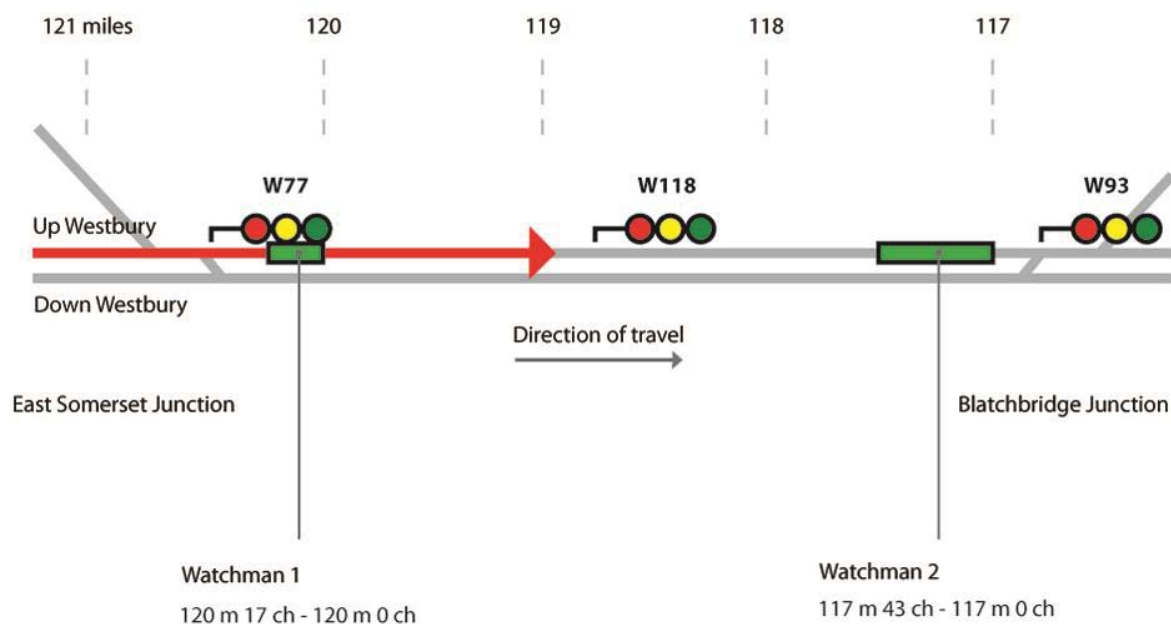
1. Important safety messages

These incidents demonstrate the importance of:

- defining the responsibility for coordinating and communicating the requirements for, and the extent of, emergency speed restrictions covering multiple watched sites
- reaching a clear understanding during safety critical communications
- all staff being appropriately qualified for the job they are required to do
- equipment and resources for implementing emergency speed restrictions being readily available prior to the restrictions needing to be applied
- watchmen reporting to the signaller trains that exceeded the emergency speed restriction.

2. Summary of the incidents

Between 11:00 hrs and 14:03 hrs on Tuesday 19 July 2016, six trains passed through an emergency speed restriction (ESR) between East Somerset Junction and Blatchbridge Junction at excessive speed.



Simplified diagram showing relative positions of the speed restrictions (not to scale)

The trains involved are listed in order. The times given are when each train passed signal W77 at the start of the ESR. The ESR given in the table applied at the time for that type of train. It had been imposed as a precaution in case of the track buckling in the hot weather that was being experienced at the time. Mileages are quoted here in miles (m) and chains (c), measured from a datum of zero at Paddington station. The train speed refers to that between signals W118 (118 m 60 c) and W93 (116 m 74 c).

Time	Train	ESR	Train speed
11:18	6C84, engineering train from Taunton - Westbury	30 mph (48 km/h)	60 mph (96 km/h)
12:30	1A81, 08:44 hrs Penzance - Paddington passenger train	60 mph (96 km/h)	100 mph 160 km/h)
12:51	2V90, 11:10hrs Weymouth - Bristol passenger train	20 mph (32 km/h)	39 mph (62 km/h)
13:22	1A82, 11:32 hrs Paignton - Paddington	20 mph (32 km/h)	86 mph (138 km/h)
13:28	6A77, freight train Merehead Quarry - Theale	20 mph (32 km/h)	36 mph (58 km/h)
13:58	1A83, 10:00 hrs Penzance - Paddington passenger train	20 mph (32 km/h)	93 mph (149 km/h)

3. Cause of the incidents

Network Rail’s process for managing the risk of track buckles is defined in its standard NR/L2/TRK/001/mod14 ‘Managing track in hot weather’. This requires that a Critical Rail Temperature (CRT) register is compiled of sites requiring mitigation against the risk of track buckles when high rail temperatures are forecast. The standard also specifies the criteria that lead to the inclusion of a section of track in the CRT register. The two sections of track involved in this incident were included because of low levels of track ballast.

The standard defines the actions that must be taken when the rail reaches certain critical temperatures. Three levels of CRT are defined:

- CRT(W) is the temperature at which a watchman is to be appointed to monitor the site
- CRT(30/60) is a higher temperature at which an emergency speed restriction of 60 mph for passenger trains and 30 mph for other trains is to be applied
- CRT(20) is a higher temperature still, at which an emergency speed restriction of 20 mph is to be applied for all traffic.

On the morning of Tuesday 19 July the weather forecast indicated that high rail temperatures were likely in the area and Network Rail's Westbury-based track maintenance staff were deployed to act as watchmen at various sites.

The duties of a watchman are defined in Network Rail's standard NR/L3/TRK/3012 'Management of hot weather precautions (track)'. This states that the watchman is required to take a reading of the rail temperature at half hourly intervals and compare it with the CRT values for that site. If the temperature exceeds one of the higher CRT values, then the watchman is required to report this to the section manager (track), who is then responsible for managing the introduction of an ESR. The watchman is also required to monitor the track for any signs of buckling of the rails.

On 19 July, two sites were being monitored on the up line between East Somerset Junction and Blatchbridge Junction. Watchman 1 was deployed to a site 0.21 miles (0.34 km) long which extended between 120 m 17 c and 120 m 0 c , and watchman 2 to a site 2.5 miles (4 km) further east which was 0.54 miles (0.86 km) long, between 117 m 43 c and 117 m 0 c.

Network Rail standard NR/L2/TRK/001/mod14 states that watchmen should be competent to carry out watchman duties in accordance with standard NR/L2/CTM/011 'Competence and Training in Track Engineering'. Watchman 2 held this competency but watchman 1 did not.

Each watchman was issued with a copy of Network Rail's 'Hot Weather Site Monitoring Record' form, TEF 3056. These had already been filled in with the start and end mileages of the site to be monitored and the values of the critical rail temperatures for that site. This would normally be done automatically from a database of CRT sites, but track maintenance staff were unable to use this on 19 July due to an IT failure so the forms had been completed manually. The track maintenance team leader planned to implement one ESR to cover both sites. The TEF 3056 forms issued to the watchmen each stated in the remarks section that the ESR was to commence at 120 m 17 c and terminate at 117 m 0 c (ie it should encompass both watchman sites).

At 11:00 hrs, watchman 1 observed that the rail temperature at his site had exceeded the CRT(30/60) value and contacted the signaller directly to impose a 30/60 ESR, rather than asking the section manager (track) to do so. During the conversation with the signaller, he erroneously quoted the start and end of his monitoring site (120 m 17 c to 120 m 0 c) which was written at the top of the form, rather than the ESR mileages which were written in the remarks section lower down the page.

The track maintenance staff responsible for erecting the ESR signs were sent to the site between East Somerset Junction and Blatchbridge Junction, but they did not have the 30/60 ESR signs with them. Therefore, the signaller had to warn train drivers by stopping them at a signal and telling them of the presence of the ESR, its speed and the start and end mileages. As the mileage reported to the signaller was 120 m 17 c to 120 m 0 c, he relayed this information to the approaching trains and the drivers of trains 6C84 and 1A81 accelerated back to normal speed after their trains had passed the 120 mile post.

At 11:20 hrs watchman 2 observed that the rail temperature at his site had exceeded the CRT(30/60) value. Thirty minutes later, he observed that it had exceeded the CRT(20) temperature and called watchman 1 to report this but did not contact the signaller or the section manager (track). He understood that watchman 1 would contact the signaller to implement an ESR which covered both sites. However watchman 1 did not do this.

Watchman 2 noticed that trains were passing his site at normal speed and called watchman 1 to query whether the ESR had been applied. Although watchman 1 had already contacted the signaller to apply the ESR, neither watchman contacted the signaller to report the speeding.

At 12:42 hrs watchman 1 observed that the rail temperature had reached the CRT(20) temperature at his site and called the signaller directly to advise him. The track maintenance staff had signs for a 20 mph ESR and started to erect them on the approach to the start of the ESR at 120 m 17 c. The end of an ESR is marked by a board with the letter 'T' on it (termination). The track maintenance team was unclear who was to erect the 'T' board at 117 m 0 c and this task was overlooked and no 'T' board was erected.

Train 2V90 ran through the area at about the time that the track maintenance team were erecting the ESR signs and the signaller told this train's driver about the ESR, stating that it was 20 mph (32 km/h) and applied between 120 m 17 c and 120 m 0 c, believing that, although the speed had changed, the limits he was originally informed of still applied. The driver accelerated the train to normal speed after passing the 120 milepost, and, although it had slowed to take the route via Frome, it passed watchman 2's site at greater than 20 mph.

At 12:51 hrs, watchman 1 reported to the signaller that all of the signs for the 20 mph ESR were now in place, and so the signaller did not need to warn subsequent trains of it. The next train was an empty passenger train whose driver was under instruction from a driver instructor. The driver of this train responded to the ESR signs by slowing to 20 mph (32 km/h) as the train approached 120 m 17 c. He continued at 20 mph (32 km/h) until the train reached Blatchbridge Junction at 13:16 hrs when the instructor called the signaller to ask where the 'T' board was for the ESR, as they had not passed one. The signaller told him that it should have been at 120 m 0 c and called Network Rail control to report that the 'T' board was missing.

The signaller then started contacting approaching trains to advise them that the ESR 'T' board was missing at 120 m 0 c. Consequently, the drivers of trains 1A82 and 6A77 accelerated to normal speed after passing the 120 milepost. In the meantime, Network Rail control contacted Westbury track maintenance team to tell them that the 'T' board was missing at the end of their ESR.

At 13:48 hrs watchman 1 called the signaller to ask about the missing 'T' board. During the conversation the signaller referred to the board being missing at 120 m 0 c and watchman 1 mentioned that it should be at 117 m 0 c. However, the conversation ended without them reaching a common understanding of the correct location and the signaller continued to believe that the ESR ended at 120 m 0 c.

The track maintenance team leader subsequently arranged for a 'T' board to be erected at 117 m 0 c and this was in place by the time that train 1A83 approached it at 14:03 hrs, travelling at 97 mph (155 km/h). The driver of this train applied the train's emergency brake and called the signaller to report that he had passed a 'T' board at 117 m 0 c; he had been told that the ESR ended at 120 m 0 c.

Since the train had travelled over track that should have been subject to a 20 mph speed restriction at over four times that speed, the operator of train 1A83, Great Western Railway, reported it to the RAIB as a 'near miss' incident.

4. Previous similar incidents

The means of informing drivers of ESRs and the need for the equipment to be readily available was raised in the report of a train exceeding the speed limit at an ESR at [Ty Mawr](#) on 29 August 2007.

Although a train exceeded the speed limit at an ESR at Queen's Park, London, on 5 January 2015 ([RAIB report 19/2016](#)), the factors involved were different to those in this case.