

Overspeeds in weather-related blanket emergency speed restrictions on Western and Wales routes, 18 and 19 July 2022

Important safety messages

These incidents demonstrate the importance of:

- structuring safety-critical documents so that they are clear about what actions are required, and formatted in a way that assists the understanding and recall of the document
- using appropriate methods, including available technology, to make sure that safety-critical messages reach those staff who need to receive and act upon them
- railway staff ensuring that they have read and fully understood safety-critical information communicated to them, that they brief this information to other staff taking over from them, and that they have made appropriate arrangements to assist them in recalling this information when it is required

Summary of the incidents

The UK experienced an extreme heatwave between 16 and 19 July 2022. Met Office reports showed that temperatures exceeded 35°C across all of England and parts of Wales on 18 and 19 July. Rail services were severely disrupted by these high temperatures.

Extremes of temperature can pose risks to the safe operation of trains, including track buckling and issues with signalling equipment. Network Rail's operational procedure NOP 3.17 'Weather Arrangements' gives instructions for managing the risk from extreme weather. The temperatures seen during 18 and 19 July were such that these instructions required Network Rail routes to impose blanket emergency speed restrictions (BESRs, a precautionary speed restriction that is imposed over a wide area without the installation of speed restriction warning signs) on many lines

during these high temperatures. Where necessary, staff at Rail Operating Centres (ROCs) issued forms, known as late notices, detailing the speed reductions and areas affected, to the train operating companies (TOCs) running trains in the area. These forms detailed specific speed restrictions along with their geographical limits and the times for which they were to be applied.

Each TOC used their internal processes to pass this information on to their drivers. These processes varied. Some TOCs posted copies of the Network Rail late notices at drivers' booking-on points, while others issued personal copies of the late notices to each driver, either electronically or on paper.

During 18 and 19 July, the following incidents occurred in which BESR requirements were not observed:

- At 12:30 hrs on 18 July, the driver of the 07:10 hrs Penzance to Paddington service travelled at speeds of up to 125 mph (201 km/h) in a 60 mph (97 km/h) BESR which applied between Bristol and Swindon on Network Rail's Western route. The driver had been diverted from his usual route, which was subject to the same BESR, and had contacted the signaller at Thames Valley Signalling Centre to ascertain whether a BESR applied to this new route as well. The signaller stated that he was unaware of a BESR being introduced on the new route and this resulted in the driver proceeding at normal line speed. Although the driver had with them a copy of the late notice, which showed that the BESR applied to the new route, it was in their bag and not immediately accessible to them while driving the train.
- At 20:50 hrs on 18 July, the 20:04 hrs Bristol Parkway to Portsmouth Harbour service travelled at speeds up to 71 mph (114 km/h) when travelling through a 60 mph (97 km/h) BESR which applied between Bristol and Bath on Network Rail's Western route. The driver believed that the restriction had ended at 20:00 hrs, which was correct for Wessex route (on which the later part of the journey was to take place), but not for the Western route, where the BESR remained in force until 22:00 hrs.
- At 11:50 hrs on 19 July, the 08:05 hrs Holyhead to Cardiff Central service was reported passing over a hot axle box detector near Craven Arms on Network Rail's Wales route at 89 mph (143 km/h) while subject to a 60 mph (97 km/h) BESR.
- At 12:55 hrs on 19 July, the 09:08 hrs Milford Haven to Crewe service was reported passing over a hot axle box detector at Tram Inn near Hereford on Network Rail's Wales route at 70 mph (113 km/h) when subject to a 60 mph (97 km/h) BESR. The driver reported that they had not seen the late notice with details of the BESR.

Although some of these trains travelled at speeds significantly above the BESRs, no reported consequences resulted from these overspeeds.

Evidence shows that other drivers called signallers to make enquiries as to the status of BESRs on 18 and 19 July because they were not sure of their details. However, these uncertainties did not result in overspeeds because they were given correct information. It is also possible that further overspeeding incidents occurred during this period which were not identified.

Cause of the incidents

These overspeeding incidents occurred because the drivers of the trains involved did not have a clear understanding of where, or when, the relevant BESR applied. In one case, a driver’s incorrect understanding of the extent of a BESR was reinforced by a signaller, who also did not have the correct understanding of its application.

The times and locations to which the BESRs applied were all described in late notices which were either issued to the drivers concerned or displayed at their booking-on points. However, during an investigation into trains overspeeding between Laurencekirk and Portlethen, Aberdeenshire ([RAIB report 08/2021](#)), RAIB found that BESR notices did not always convey information in a way that could be readily understood and remembered by drivers later, when they needed to apply it. Drivers were also not reminded of the BESR after booking on; for example, at or near the limits of where it applied.

Again, in these instances, the format of the late notices could have been a factor. The descriptions of the areas where the BESRs applied was difficult to memorise because many areas were listed on the same notice. Additionally, witness evidence indicated that the different times that the BESRs were applicable on neighbouring routes meant that at least one of the drivers was confused about whether they should still be observing the BESR.

NOTICE TO TRAIN CREWS
BLANKET SPEED RESTRICTION
IMPOSED

Depot* _____ Date/Time: 19:00 Sunday 17th July 2022

Routes: **ALL LINES ON WESTERN ROUTE NORTH AND EAST OF COGLOAD JUNCTION (TAUNTON)**

THE FOLLOWING BLANKET SPEED RESTRICTION HAS BEEN IMPOSED ON
MONDAY 18th JULY 2022 BETWEEN LOCATIONS SHOWN BELOW
FOR THE TIME PERIOD 12:00 TO 22:00 MONDAY 18th JULY 2022.
DURING THIS PERIOD THE SPEED OF ALL TRAINS MUST NOT EXCEED: -

30
60

MPH OR

THIRTY OVER SIXTY

Has this speed been imposed as a result of severe or adverse weather conditions? **YES**

Lines of Route:	ALL LINES
At or between:	PADDINGTON TO COGLOAD JUNCTION (VIA FORDGATE & ATHELNEY). INCLUDING ALL WESTERN ROUTE LINES NORTH AND EAST OF COGLOAD JN (TAUNTON) TO REGIONAL BOUNDARIES WITH NORTH WEST & CENTRAL / WALES & WESSEX (Acton Wells/ Northolt/ Woodstock Rd Jn/ Heyford/ Pershore/ Eckington/ Awre L.C/ Pilling/ Warminster)

Extract of BESR notice issued by Network Rail

When the driver of the Penzance to Paddington service sought additional confirmation as to how a BESR applied to their train, the signaller concerned was either unaware of the BESR or had an incorrect understanding of its extent. This was because the notice had been filed by staff on the previous shift and the signaller had not been briefed about it when they took over at shift handover.

Network Rail has a process which permits its route control centres to advise drivers of the presence of BESRs via reminders broadcast on the GSM-R (railway radio) system. GSM-R is configured to allow reminder broadcasts to be triggered automatically as the train's presence is detected by the signalling system. This means that they can be triggered to apply to trains passing geographic locations.

In these incidents none of the route control centres involved had set up GSM-R reminder broadcasts. On the Western route this was because, although there was an instruction in place to use them, the signallers were not clear on which sections of track they should implement the broadcasts. In other control centres, the decision not to use the broadcasts was taken because the late notices were published the evening before the BESRs came into force and it was thought that drivers would have had the opportunity to see them. Immediately after the incidents at Craven Arms and Tram Inn, Network Rail's Wales route introduced these broadcasts for the heat-related BESR, while the Western route started using them on subsequent days.

Previous similar occurrences

RAIB has investigated several incidents involving overspeeds at temporary, emergency and blanket emergency speed restrictions. These include:

- At Queen's Park in north-west London, on 5 January 2016 ([RAIB report 19/2016](#)), a 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. RAIB's report included a recommendation to improve the communication of safety-critical information.
- At Sandy South Junction, Bedfordshire, on 19 October 2018 ([RAIB report 10/2019](#)), a passenger train traversed a section of track at Sandy South Junction, where an emergency speed restriction of 20 mph (32 km/h) was in place, at approximately 121 mph (195 km/h). RAIB's report included recommendations intended to minimise the risk of drivers not being aware of relevant speed restrictions before starting their journeys and to provide drivers with additional warnings of speed restrictions near to the location of the restriction via the use of available technologies.
- Between Laurencekirk and Portlethen, Aberdeenshire, on 4 December 2020 ([RAIB report 08/2021](#)), six trains exceeded a 40 mph (64 km/h) BESR which had been imposed because of a forecast of heavy rain with the associated risk of an earthwork failure obstructing the line. These trains travelled through the BESR at speeds of up to 100 mph (161 km/h). RAIB's report included recommendations intended to improve BESR notices provided to drivers and to trigger a review of the methods used to implement blanket emergency speed restrictions. The report also included learning points concerning the importance of drivers being

aware of information contained in late notices, and the need for safety-critical communications to provide clear and unambiguous information.

- In February 2022, RAIB wrote to the Office of Rail and Road as well as train and freight operating companies in relation to overspeeding incidents in north-west England and Scotland which had occurred in BESRs. This is referred to on our [website](#).