

# Passengers self-evacuating at North Pole Junction, 15 July 2019

## Important safety messages

This incident demonstrates the importance of:

- good and accurate communications between staff on the ground, and railway infrastructure and train service controllers
- effectively supporting the drivers of trains involved in stranding incidents, minimising the time needed to explain things to control centre staff, so that the driver can focus on their passengers and fault finding where practicable (see recommendation 1 of [RAIB report 16/2018](#))
- undertaking regular and accurate assessments of the situation to understand if it is escalating
- ensuring that any limitations of equipment, such as GSM-R boundaries, are known and understood by operators with appropriate mitigations in place, or put in place as soon as possible once identified during an incident
- understanding the risks of passengers remaining in stranded trains for prolonged periods in hot weather without adequate facilities or ventilation
- regularly updating passengers on a developing situation

## Summary of the incident

At around 16:54 hrs, train 2L97, the 16:36 hrs London Overground service from Clapham Junction to Stratford, formed of a 5-car class 378 unit with between 500 and 600 passengers on board, stopped at North Pole Junction, a short distance beyond Shepherd's Bush station. The train, which was operated by Arriva Rail London (ARL), became unable to draw power during the switch over from the third rail 750V DC supply to the 25kV AC overhead supply, and consequently was unable to move. This location is the northern boundary of the third rail electrification system on this line, and is where electric trains travelling from Clapham Junction towards Willesden must change over to the overhead power supply.

After attempting to move the train for a few minutes, the driver reported that the train was unable to move, first to the signaller at Wembley mainline signal control centre, and then to the train operating company's control centre.

Due to difficulties in communicating with the correct signal box (the driver should have been speaking with Victoria signalling centre but was unable to contact it using the GSM-R radio system), and conflicting messages between ARL and Network Rail, there was a significant delay in agreeing a course of action. Around 17:53 hrs, 57 minutes after the train became stranded, passengers began to self-evacuate onto tracks where both the third rail and the overhead line traction supply current were still energised and trains were running. From social media messages, it is clear some passengers on the train were feeling the effects of heat, and some were becoming stressed and fearful for their own safety.

The driver of a train in a siding nearby saw people getting off the stranded train on to the track. He made a radio call to ask for traction current to be switched off in the area. Responding to social media messages describing fainting passengers, British Transport Police (BTP) sent officers to the site, having first checked with Network Rail and ARL that there was indeed a train stopped at North Pole Junction.

The weather was fine and sunny, and at 16:50 hrs the outside temperature was around 21°C. Because of a pre-existing fault, which had occurred the previous day and been reported for attention as soon as practicable, the leading carriage had only 50% of its lighting, ventilation and air conditioning available, so the temperature in this carriage would initially have been higher than the rest of the train. Once the train was unable to draw power, the air conditioning stopped working and only forced ventilation was available. The temperature in all the carriages would have started to increase, more rapidly in the first carriage due to the reduced ventilation available. At 17:22 hrs some systems on the train shut down and the first carriage lost all its lighting and forced ventilation. The lighting and ventilation on the rest of the train shut down at 18:06 hrs.

When BTP officers arrived at around 18:05 hrs, they first got the passengers back onto the train and then, with railway staff and other emergency services, organised a controlled evacuation using the train's built-in ladder in the north end cab, taking the passengers off the railway through the Mitre Way access point. This evacuation was completed by 19:14 hrs.

Ambulance crews treated a number of people at the roadside on Mitre Way, but there are no reports of anyone being taken to hospital.

Once the evacuation was complete, the train could not be moved until the evacuation ladder was stowed by a train technician. Another train was then used to assist the failed train to Willesden sidings, at 21:10 hrs.



The location of the incident

## Cause of the incident

The train was unable to draw either AC or DC traction power when it was being switched from the third rail DC supply to the AC overhead supply. The driver was then unable to switch back to the DC supply. The cause of the failure was a faulty line interference monitor, an electronic system which monitors the train's connection to the traction power supply and disconnects the train from the power supply if it detects frequencies which could affect lineside signalling equipment.

The cause of the extended delay was the absence of a decision as to the most appropriate course of action. No single party took the lead. The one proposal which was put forward, of returning the train to Shepherd's Bush so it could be detrained, was never developed due to poor communication between the various parties involved and a lack of appreciation that the driver was unable to move the train under its own power.

The driver of the train spent over 27 minutes of the first hour after the train came to a halt, on the phone or radio. In at least two conversations, both lengthy, the driver was speaking to the ARL control room on one device and to the signaller using another. The driver had to repeatedly remind each person he spoke to that the train was not connected to the traction power supply.

At 17:16 hrs the driver walked through the train to reset passenger emergency alarms and emergency door egress handles, to open windows throughout the train, to explain to the passengers what was happening, and to see if he could regain traction power from the cab at the back of the train. This took 11 minutes.

Because of the way the boundaries of the GSM-R system in the area are arranged, the driver was only able to communicate by radio with the signaller at Wembley, although the train was actually standing on a section of line controlled from Victoria signalling centre. No proactive approach was taken by any party to resolve this, until, at 17:30 hrs, the Wembley signaller took the driver's mobile number and passed it to the Victoria signaller. Since the incident, Network Rail has reviewed the GSM-R cell boundaries and concluded that it is not practicable to change them because of the complexity of the railway geography in the area.

The driver then spoke to the Victoria signaller, who asked if the train was a failure. The driver stated that the train was definitely a failure as he was unable to move it. The Victoria signaller asked the driver to place 'assistance protection' (detonators placed on the track in the direction an assisting train would approach from). However, at the same time the driver was talking to ARL control, who asked him to undertake a reset of the train to attempt to restore power, and not to place the protection.

The overall situation was further confused by a low standard of safety critical communications and messages not being passed correctly or efficiently. This resulted in poor decision making and a lack of a complete understanding of the situation on the train on the part of both signallers and control offices, despite the driver regularly pointing out that door egress handles and emergency alarms had been operated by passengers. The driver was shouting from the window of his cab to passengers, who were leaning out of the doors, to 'stay on the train', at the same time as he was speaking with both ARL control and the signallers.

Following the reset process, the driver needed to ring ARL control back once it had completed. Initially power appeared to have been restored on one of the two motor coaches on the train, which would have been able to get the train back to Shepherd's Bush. However, less than a minute later, while the driver was speaking to ARL control, the train again isolated itself from the traction power supply. It was during this call, at approximately 17:52 hrs, that the driver reported people alighting from the train.



## Previous similar occurrences

[RAIB report 07/2012](#) describes an incident in May 2011 in which a Brighton to Bedford train lost traction power and became stranded between St. Pancras and Kentish Town stations. During the incident passengers self-detained and began to walk trackside alongside the tunnel wall. Once an assisting train was coupled to the stranded train, the driver over-rode a safety device, as is permitted in such circumstances, to enable the combined train to move. The train driver then became aware of what the passengers were doing and stopped the train soon after it had begun to move forward. Almost three hours elapsed before the train, with its passengers still on board, was assisted into Kentish Town station.

The investigation found that there had been very little communication with passengers during the incident and a lack of coordination between the organisations and emergency services involved. The report made recommendations, intended to improve the way in which incidents involving stranded trains were handled across the network. The Office of Rail and Road has reported to RAIB that these recommendations have been implemented.

[RAIB report 16/2018](#) explains how in November 2017 a London Overground service, operated by ARL, came to a stand shortly before reaching Peckham Rye station due to a faulty component on the train causing the brakes to apply and the driver being unable to release them. There were about 450 passengers on board and, due to miscommunication and misunderstandings between the ARL controllers and Network Rail signallers, the driver of the train, with the assistance of station staff, began to detrain passengers onto a live line before action was taken to halt the process.

The RAIB concluded that there were a number of deficiencies in the training and briefing of staff and in the ARL control room arrangements. Report 16/2018 recommended that ARL should improve its response to train failures and other abnormal events. At the time of writing this digest ARL reported to RAIB that the actions to achieve this were still being implemented, with most of them expected to be complete by the end of October 2019. However, the provision of a decision support tool for the ARL control function has not yet been achieved, and is not expected until mid-2020.

In March 2018 a serious incident occurred on the railway around Lewisham in south-east London ([RAIB report 02/2019](#)). In severe, cold weather, ice forming on the conductor rails caused difficulties for a train attempting to leave Lewisham station. The train moved forward very slowly, and another train was trapped behind it, across a key junction, and this in turn caused the train that was following it to block another junction. This resulted in a further seven trains being unable to move. Passengers got out of several of the stranded trains, resulting in the traction current being turned off over a wide area. The uncontrolled nature of the detrainments delayed traction power reinstatement and resulted in trains being stranded for around four and a half hours. Emergency services attended and helped with incident management and recovery. Although no-one was seriously injured, conditions on all of the stranded trains became very difficult for passengers and staff.

The investigation found that the initial detrainment occurred because of the time the train had been held at the signal. Passengers were getting increasingly uncomfortable in crowded carriages with no toilet facilities. Ultimately the motivation of passengers to leave the train outweighed the effectiveness of encouragements to stay on board.

Because the seriousness of the emerging situation at Lewisham was not recognised sufficiently quickly, key decisions were not made to define and implement plans to manage the circumstances. Other factors included informal communication using inappropriate channels, poor presentation of key operational information and ill-defined incident management processes. Recommendation 2 of report 02/2019 is concerned with the timely identification and management of train stranding events. Actions to implement this recommendation are still in progress.