

# CASE STUDY

**4**  
YEARS

of proven Tier 1  
monitoring  
technology.

## CRITICAL MAINLINE STATION

**Fault finding with  
CableGuardian**

 **VIPER  
INNOVATIONS**

[www.viperinnovations.com](http://www.viperinnovations.com)

# JOIN THE REVOLUTION to improve signalling resilience

**CableGuardian is the only Network Rail approved cable monitoring system that offers adherence to Tier 3, Tier 2 & Tier 1 of the Network Rail standard NR/L2/SIGELP/27725 - Insulation Monitoring and Fault Location Systems for use on Singalling Power Systems.**



**Tier 3 Approved**



**Tier 2 Approved**



**Tier 1 Approved**

**Proven Trackside Technology Since 2018:** This advanced system has been proven in operation since August 2018, with multiple UK regions already benefitting from the technology and further installations scheduled across the network this year.

## **Key Benefits:**

- Fewer boots on ballast fault finding and cable testing.
- Quickly and accurately locate cable faults and cable theft.
- User friendly web portal for fault diagnosis and location.
- Allows trending of insulation resistance and insulation capacitance at a cable section level.
- Technological alternative to the 5 yearly manual cable testing requirements.

**CableGuardian helping passengers to arrive on time.**



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# CABLEGUARDIAN SYSTEM AVOIDS POTENTIAL SIGNALLING POWER FAILURE AND DELAYS TO PASSENGERS WITHOUT NEED OF A POSSESSION.

In a recent intervention, **CableGuardian** has again shown its credentials as a key tool in the prevention of significant train disruption on the UK rail network by enabling staff to quickly identify a failing cable long before a fault occurred. This therefore avoided a signalling power failure and potentially thousands of delay minutes for the rail operator.

**£5M Saved**  
In Penalty Payments

**30K Avoided**  
In Delay Minutes

**4 Years**  
Of Proven Tier 1 Monitoring

**£150K Saved**  
In Maintenance Costs

One recent installation site, located in the West of England, consists of 12 **CableGuardian** units configured in a Tier 2 arrangement with units installed simply in existing equipment buildings. This system continually monitors approximately 48 km of cables, switchgear, and other components along multiple feeders around a critical mainline station.

In addition to the permanently located **CableGuardian** units, the Delivery Unit also purchased 2 extra sets of hardware, incorporating split-core measurement coils, which enables the local Maintenance teams to rapidly install **CableGuardian** in locations which the Tier 2 monitoring system has indicated as being of some concern. This rapid deployment, as a portable roaming unit, is supported by the Viper Innovations Technical Support Team and creates a temporary Tier 1 system. This enables more localised data to be captured relating to the area of concern.

In January 2022, Viper Innovations' Engineers supported the local maintenance team to install a **CableGuardian** unit part way along a feeder which had a low insulation resistance based on the Tier 2 data trend. As the data captured is instantly viewable in the **CableGuardian** web portal, Network Rail Engineers were able to view the status of insulation resistance of the live rail network, in real time.

Critical to this process is **CableGuardian's** advanced monitoring functionality that allows the insulation resistance of feeders or even individual cables to be trended from 1KOhm right up to 10MOhms, delivering unmatched visibility of cable health and truly enabling proactive maintenance.



**CableGuardian** portal showing IR readings for the Sub-Network Section.

The data captured indicated that the insulation resistance for the specific section of cable was 0.55MΩ, well below the expected value for that section. The cable section was isolated, and a manual test confirmed the measurement taken by the **CableGuardian** unit.

The faulty cable was left isolated as it was supplying up to an open point at the end of a dual end fed system. Once isolated, the local insulation resistance on the feeder increased to  $>10M\Omega$ .

Having successfully located one faulty cable, the portable **CableGuardian** unit was moved to a location on a new feeder which also had a lower than expected Tier 2 insulation resistance value. The Viper Innovations Technical Support team were able to remotely update the **CableGuardian** web portal to display the Tier 1 data for the new location. The data captured confirmed that one of the cable sections did have a low insulation resistance value ( $<400k\Omega$ ). The Network Rail Engineers took the decision to leave the **CableGuardian** at this location to monitor and trend how the suspected cable section was affected by precipitation over a period of a few weeks before deciding on how to proceed.

This case study is an excellent example of proactive monitoring and early intervention by Network Rail's maintenance team, and demonstrates why **CableGuardian** is a must-have in the toolkit of all maintainers to prevent service affecting failures of signalling power supplies.

A usually long and disruptive fault-finding process has been replaced by a simple and non-invasive solution. Planned maintenance can be reduced by as much as 80%, whilst incident response is either avoided altogether by allowing intervention many months prior to failure, or dramatically reduced by pinpointing catastrophic failure. This can reduce delay per incident by many thousands of minutes.



Temporary installation of roaming **CableGuardian** unit, which also offers the flexibility to be fitted upside down if needed. No special requirements for installation.



### The Lead Engineer involved in the process stated:

*“The information provided by **CableGuardian**, made available by the remote Technical Support of Viper Innovations and the subsequent actions of our Engineers, enabled us to evaluate the performance of specific cables and identify the issues stated within a single morning and without disrupting train services.”*

