AIVR® OLE

The innovative technology that remotely and safely monitors the status and condition of the **Overhead Line Equipment.**

The Challenge

The delivery of a more sustainable railway has increased demands for the electrification of rail networks, enhancing the need for monitoring and predictive maintenance methods for thousands of miles of overhead line equipment.

The consequence of issues with Overhead Line Equipment results in partial sections of the track needing possession or closures for emergency repair works, resulting in **high costs** and **severe delays to operations**.

The Solution: AIVR OLE

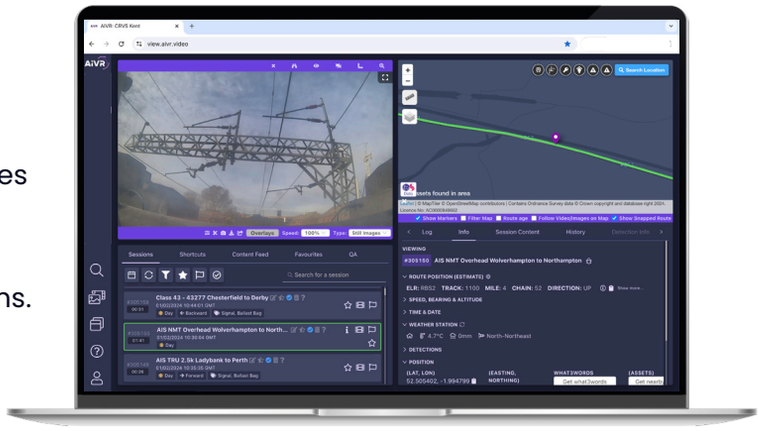
AIVR OLE enables railway operators to **proactively address predictive maintenance challenges**, effectively helping to avoid unplanned downtime and improve the longevity of their railway assets.

Inspect Overhead Line Equipment on the AIVR Platform

On the AIVR Platform, users can analyse the status and condition of overhead line equipment, alongside it's locational positioning.

AIVR combines overhead imagery with exceedances from other analysis tools such as instrumented pantographs, contact wire-wear systems, data insight tools, and vision-based exceedance systems.

Applied **Machine Learning alerts users** to exceedances to contact to wire heights and arcing, which are geographically mapped and can be viewed through a live asset map.



This troubleshooting of pantograph issues enables the user to **holistically understand the problems** using both the data and the video.

AIVR OLE utilises a range of **innovative capture systems** to rapidly deliver data to support **advanced digital inspection methods** and **predictive maintenance planning** for OLE.

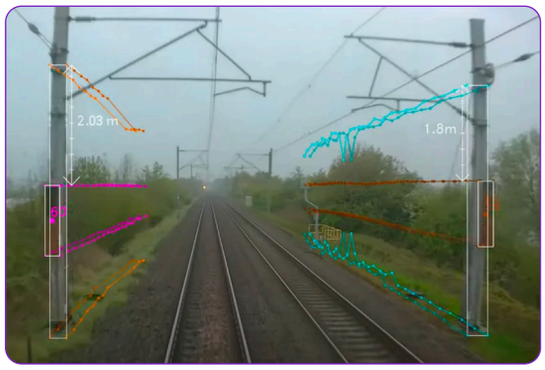
The innovative solution consists of:

- Forward Facing and Instrumented Pantograph Imagery captured from onboard trains (extracted using the AIVR Connect system), and **third party integrations**.
- Video and locational data automatically transmitted and available on the **AIVR Platform**, alongside third party integrations, for users to review, **reducing the requirement for boots on ballast.**
- AIVR's Machine Learning models are applied to **automatically detect OLE status and condition,** enabling quicker findings and decisions to be made on infrastructure issues.

OLE Climate Resilience

AIVR's Machine Learning models tackle weather-induced railway failures by **automatically identifying and measuring balance weights along the trackside**. The AI capability helps mitigate the weather impact on overhead wires by providing **continued monitoring** of the height and descent of balance weights. This aligns with integrated weather station updates, helping to **prevent slackened lines in extreme weather** and avert the potential associated safety risks.

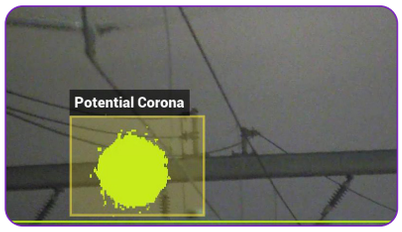
AIVR's Machine Learning proficiency enables engineers to be **rapidly alerted to any potential issues**, reducing the need for manual preparation surveys, and allowing rail companies to plan and execute maintenance works before – rather than after – major faults develop.



Corona Discharge

Corona discharge is significant in indicating future damage to the OLE such as corrosion or collapse of the Overhead Line.

The project stipulates the deployment of a UV camera affixed to the top of the train to allow **direct capture of Corona discharge along the Overhead Line.**



Using a combination of the UV camera instrumentation, locally measured temperature and humidity, statistical analysis and Machine Learning, levels of Corona discharge on assets are automatically measured and classified within the AIVR platform.

Interested in learning more?

Get in touch to learn more about AIVR OLE, email us on: enquiries@onebigcircle.co.uk

NATIONAL RAIL AWARDS 2023 WINNER