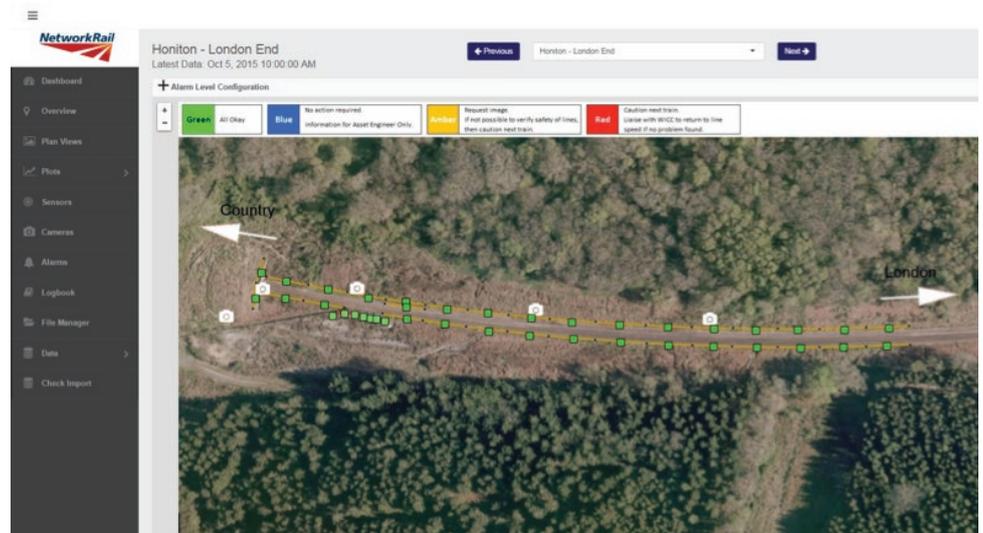


PROJECT PROFILE

Network Rail: Earthworks Remote Condition Monitoring



Client

Network Rail

Start Date

2013

Completion Date

Ongoing

System

- Tilt sensors
- Data logger
- Draw wire sensors
- Water level sensors
- Infra-red light cameras
- Calyx OMS monitoring software

Overview:

In 2013, ITM Monitoring was selected to supply remote condition monitoring systems for earthworks and drainage assets across the Network Rail Wessex Route. This encompassed 10 sites with elements ranging from water level monitoring to slope movement, with more planned for CP5. Whilst all of these sites are different, the consistent theme across all of them was the ITM Monitoring approach to ensure these monitoring system met the requirements of the asset manager.

As part of ITM Monitoring’s full end-to-end process, we consulted with the asset engineer on each site to create a Monitoring Design Plan (MDP) which united the specific data requirements of the Network Rail Asset Engineer with the expertise of our System Design Team. Following the release of a Monitoring Remit from Network Rail, we initiated an MDP, which was continually reviewed and revised, with all changes tracked and archived through our Support Team, until both Network Rail and ITM Monitoring were satisfied that the planned monitoring system would be fit for purpose.

Once agreed, this MDP was used to define equipment, installation processes and the inspection and test plan for the monitoring system.

Across each of the 10 sites, Network Rail opted for automated data delivery through ITM Monitoring’s web based monitoring software - a fully supported decision support tool which has been used on hundreds of critical sites worldwide. The web based monitoring software was tailored to meet Network Rail’s specific requirements, including site overview maps, multiple alarm threshold levels and on screen image comparison of ‘reference’ and ‘latest’ image from on-site cameras to support decision making.

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As part of these works, Network Rail identified a cutting at Crewkerne which needed monitoring. ITM Monitoring advised on the use of automated surface mounted tilt sensors to alert Network Rail engineers to any movement at the toe of the slope. These were installed along the toe of the slope at 5m centres and cabled to a smart data logger. In addition to the sensors, ITM Monitoring installed a number of remote cameras with infra-red lights, images from which were used by ITM Monitoring and Network Rail to validate readings from the sensors without attending site.

As with many sites, there was no permanent power supply, but the ITM Monitoring sensor system is designed to be extremely power efficient and can operate for months without the need for solar panel or battery change.

Once the installation was completed the web monitoring software was set up, alarm levels set and the system formally handed over to Network Rail, with the ongoing involvement of the ITM Monitoring support team.

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Quote:

Commenting on these Network Rail systems, Route Asset Engineer Hector Kidds said: *"The Remote Condition Monitoring systems from ITM Monitoring are invaluable when deciding if we need to route prove after periods of heavy rain overnight, where slope movements have been detected or when river levels reached a critical point. The system also has benefits for our staff in terms of health and safety as it moderates the need for engineers to manually assess site conditions, particularly since this often used to be necessary in extremely poor weather. The information gleaned from the sensors allows us to take preventative action where possible but has also been used to caution or stop the service, thereby allowing us to reduce the risk to the travelling public."*

Night/day view through infra-red cameras installed on site

The screenshot shows the Network Rail monitoring software interface. On the left, there is a navigation menu with options: Crewkerne Country End (dropdown), Overview, Select project plot (dropdown), Select plan view (dropdown), Alarms, Cameras, Filemanager, and Logbook. The main area displays two camera feeds side-by-side. The left feed is a night view showing a railway track with a person standing nearby, with a timestamp 'Uploaded : Mar 16, 2015 02:01:14'. The right feed is a day view showing a similar scene, with a timestamp 'Feb 03, 2015'.