HITACHI ABB

Network Rail

CASE STUDY

Increasing the availability of rail infrastructure to enable greater passenger capacity and safer track maintenance with Ellipse EAM

NetworkRail

The customer

Network Rail owns, operates and develops Britain's railway infrastructure, which includes 20,000 miles of track, 30,000 bridges, tunnels and viaducts, and thousands of signals, level crossings and stations. Network Rail also manages 20 of the United Kingdom's largest stations. Around 4.7 million journeys are made every day on the United Kingdom's rail network and passenger numbers have grown significantly in recent years. To respond to the needs of passengers now and in the future, Network Rail knows that maintaining and creating extra capacity is essential. Together with Hitachi ABB Power Grids, Network Rail set out to explore new possibilities in infrastructure efficiencies and insight.

The challenges

Network Rail plans and funds its activity in five-year "Control Periods," which are agreed with its regulator, the Office of Rail and Road. As part of the Control Period 6 (CP6) funding cycle, which commenced in April 2019, Network Rail decided to focus on making greater use of its existing Ellipse® Enterprise Asset Management (EAM) solution. Ellipse EAM, part of the Digital Enterprise portfolio, provided a scalable and innovative structure for its digital railway strategy and would therefore enable improvements mapped out in the "Intelligent Infrastructure Program" of their linear asset network.

Driven by safety, performance and cost control, Network Rail set out to reduce potential risks to its employees and limit the number of planned and unplanned maintenance operations by increasing efficiency in the planning and resolution of track geometry faults. Program objectives included:

- Record all identified defects and faults
- Ensure defects are actioned when required
- Be able to track the status of defects and associated remedial work
- Be able to review all defects/faults and work associated with an asset or location
- Facilitate the analysis of trends and effectiveness of remedial work, costs and asset management strategy

The TIGER (Track Integrated Geometry Engineers' Reports) project was born, to replace paper-based records with Ellipse EAM.

The solution

The basic process put in place is straightforward: Track geometry data (geometry faults and alerts, dip defects and super reds, very-poor and poor track quality) is gathered and loaded into a centralized system; this data is shared with Ellipse, which simplifies the process of raising work orders.

"Faults can be managed throughout their lifecycle to closure and sign-off, replacing the existing paper process. It also offers more functionality to correctly identify potential repeat faults, faults within S&C and faults occurring within a registered eighth of a mile, simplifying appropriate sign-off where necessary. Manual geometry measurement fault data can also be loaded into TIGER locally, so all geometry fault data is in one place."* Additionally, a suite of TIGER reports and a dashboard have also been created to support the presentation of track geometry data to other stakeholders via Ellipse EAM.

To the uninitiated, it may not sound revolutionary, but the new process has been a game-changer. Network Rail operates through a devolved route business; the individual routes operate, maintain and renew infrastructure to deliver a safe and reliable railway for passengers and freight. As such, everything was paper-based and decentralized no one could see the broader national picture.

The TIGER solution opened up a new world of information, enabling the individual routes to apply more strategic thinking when it came to their asset management for efficiencies in time and money. By exploiting their existing Ellipse EAM solution, Network Rail has improved data and their mobile paperless capability.

*"TIGER is released into the paperwork jungle." Grahame Taylor, Rail Engineer. March 2020. https://www.railengineer.co.uk/2020/03/13/tiger-is-released-into-the-paperwork-jungle/

The results

The Ellipse EAM system provides the routes with an in-depth view of track ID history, which enables condition-based rather than time-based maintenance. For the frontline staff, this means a huge reduction in errors, due to more accurate and timely work orders logged, processed and efficiently closed in the system.

Downstream systems can be fed with critical information, which drives decision support. Data is now being used as an asset across all routes and across the business.

Talking about the project, Nik Connelly, Network Rail's Business System Owner, said: "The TIGER project is one that removes a legacy process and is being enthusiastically adopted by the Regions. We collect data in many different formats and ways such as aerial surveys, train-mounted equipment, sensors and manual inspections. The key requirements were to ensure a consolidated and single version of the truth with a user interface that makes data from our sources come to life without having to search line by line."

The Ellipse EAM solution not only provides a single source of data for track geometry, but also enables more straightforward regulatory reporting for the Office of Rail & Road. By implementing the Ellipse EAM Alarms & Defects module, Network Rail's enables Network Rail to transition to a progressive, risk-based maintenance (RBM) approach.

RBM is reliant on understanding the condition of any asset and undertaking corrective action before it fails or seriously impacts the network. This will use targeted and effective maintenance through the Ellipse solution to ensure that assets are available. In turn, trains will run on time and Network Rail can reduce the number of trackside maintenance jobs and avoid the need to send technicians onto the infrastructure.

The collaborative partnership forged between Network Rail and Hitachi ABB Power Grids ensured a solution that meets the needs of the actual users, which promoted a successful adoption within the business. Experience of previous technology projects is what convinced Mr. Connelly to implement the project with technology and culture partners. "Previous programs have focused on the technology and not on the people," he said. "That's why this is a transformational program with 80 percent of the work being transformational and 20 percent being technology."

For Network Rail, Putting the Customer First is such a focus that they've made it a corporate initiative. The success of the TIGER project is only the beginning. "For CP6, the challenge is to build on the TIGER project to drive change across people, data, investment and projects," says Mr. Connelly. "Looking ahead, the Intelligent Infrastructure Program will improve the way we collect, record and use data. This will enable us to make better decisions by understanding the whole life of our assets and their related failure modes. Ultimately, it will improve stakeholder and passenger experience."

HITACHI ABB

Hitachi ABB Power Grids
marketing-update@hitachi-powergrids.com
hitachiabb-powergrids.com

9AKK107680A4924-US