Consulting

Signalling & Control Systems

Background

Network Rail owns and operates one of the world's most heavily used railways – accommodating 1.5 billion passenger journeys and 7 million train movements every year. The control, management and safety of each train movement depends on our signalling and control systems.

The Challenge

Our challenge is to achieve high levels of operational safety and performance through the implementation of reliable and cost-effective signalling, command and control systems. Network Rail achieves this through a range of technologies, including:

- European Rail Traffic Management Systems (ERTMS), Global System for Mobile Communications – Railway (GSM-R) and Automatic Train Protection (ATP)
- level crossing signalling and protection systems
- interlocking, trackside systems, staff protection and remote asset condition monitoring systems.

How We Can Help

You can access our experience in signalling and control systems throughout the complete project lifecycle, including:

- concept design and feasibility
- business case preparation and review
- operational planning and programme management
- application and engineering standards development
- risk and value engineering
- systems modelling, engineering, integration and review
- implementation, assurance and commissioning
- system deployment, system verification and validation
- safety case and pre-commissioning review
- operational readiness planning
- safety certification management
- asset management
- economic and technical evaluation of whole-life asset performance and performance improvement
- system performance and RAMS modelling
- system upgrade and obsolescence management
- incident investigation and analysis
- scheme stagework design
- new technology introduction.

European Rail Traffic Management System (ERTMS)

The European Rail Traffic Management System (ERTMS) Early Deployment Scheme on the Cambrian lines was the pilot project for Level 2 deployment for the GB Network and was brought into commercial service in March 2011.

This European tried and tested system will replace traditional railway signals with a computer display inside every train cab, introducing full automatic train protection and is expected to reduce the costs of maintaining the railway, improve performance and enhance safety.

Our next schemes will be to deploy ERTMS on the Great Western Main Line as part of the large-scale resignalling of the line, coinciding with the arrival of new trains and electrification and to deploy it onto the East Coast Mainline. Taking control By bringing the control system inside each individual train, ERTMS allows specific customised control.

This allows the drivers to always run at the optimum safe speed helping more trains run faster and recover from delays more quickly. ERTMS allows the railway to become much more responsive, adaptable and affordable.

ETCS National Integration Facility

So that the Hertford National We are currently building a National ETCS Integration Facility to support the delivery of our schemes. For the facility bi-directional signalling is being installed on the northern section of the Hertford Loop, to allow the down line between Molewood Tunnel and Langley South junction to become a test facility.

During peak hours the section will be part of the normal railway, but when ETCS testing is needed the block will be 'switched out' – switching control from King's Cross signal box to a laboratory facility being built at Hitchin.

We are also fitting a Class 313 train with ETCS for use as a test train in the facility. The lab at Hitchin will allow full system functionality development and simulation of ETCS.

It is expected that the ETCS National Integration facility will become operational Summer 2013.

Indicative schemes over next 20 years

- Thameslink Core - 2018
- Great Western Mainline (London to Bristol) - 2018
- East Coast Mainline (London to Doncaster South) - 2018
- Midland Mainline -2020/23
- Scotland early 2020s
- West Coast Mainline North late 2020s
- South of England late 2030s.