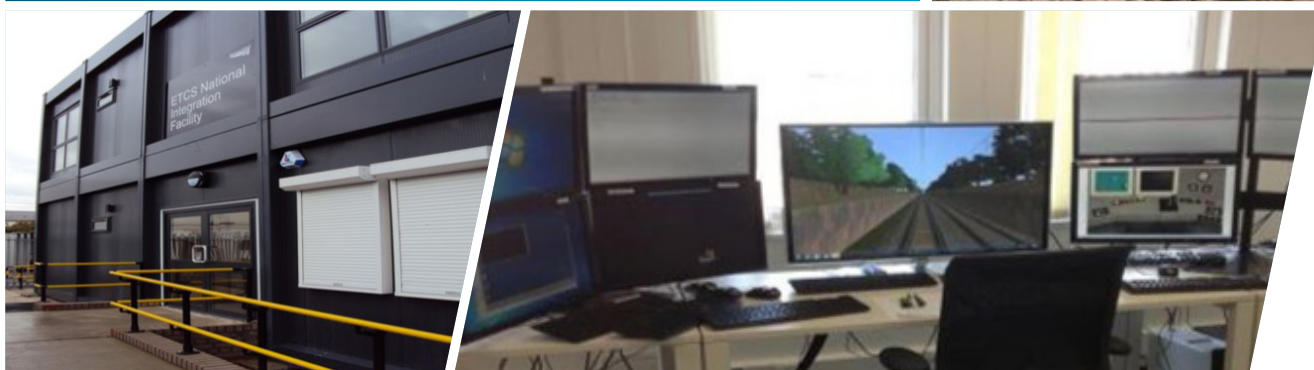**NetworkRail**

Development & Implementation of ETCS (European Train Control System)

Background

The European Train Control System (ETCS) was initiated by the European Commission in the early 2000's to improve interoperability between different countries' railways, to lower implementation costs, to improve safety and to allow greater access for suppliers across Europe by having commonality of systems.

In 2005 Network Rail began a feasibility study of the installation of ETCS technologies for major re-signalling schemes in the UK. In 2011, Network Rail then implemented a pilot ETCS level 2 project without lineside signalling on the Cambrian Line, in mid-Wales. The intention was that, once the pilot was successful, ETCS level 2 would be rolled out across the UK's railway network.

The pilot project proved a success and ETCS is now a core part of Network Rail's plans for renewal of signalling systems and is central to the 'Digital Railway' initiative for the future.

The reach of ETCS has extended beyond Europe's borders and is recognised as a standard technology by railway operators globally, and is being implemented worldwide. We have already worked with a number of clients internationally to assist them in implementing

The Challenge

Although ETCS has been available for approximately 10 years, the technology is still developing, as different networks identify new applications and experience from railways where it is already in operation is gained and used to refine the system.

Infrastructure owners and operators require an in-depth understanding of the latest capabilities and developments to ensure the right specification and configuration for their network.

Network Rail is one of the leading developers of ETCS on a major railway. We understand the complex technologies and systems, and how to successfully integrate them. We understand how ETCS is rapidly evolving, and we can use our skills and experience to help you in developing your own system.

The implementation of ETCS is not only a technological change; it requires organisational change to working processes for signallers, train staff and maintenance staff. As network operator and maintainer, Network Rail has first-hand experience of implementing these changes, and can assist you managing change in your organisation.

How We Can Help

Network Rail is experienced at undertaking complex projects on operational railway environments, minimising disruption for passengers whilst implementing projects efficiently. Network Rail has amassed a wealth of experience in implementing ETCS, including:

development of business cases production of operational concepts

project development and design

installation, testing and commissioning; and safety and system approvals.

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Cambrian Line Resignalling

In 2011 Network Rail completed the commissioning of ETCS level 2 on 260km of railway on the Cambrian Line between Shrewsbury, Aberystwyth and Pwllheli, controlled from a new signalling centre at Machynlleth. The project also equipped passenger trains and locomotives used for engineering services and freight haulage.

Network Rail gained valuable experience of developing the operational concept and technical solutions and then managing the implementation of ETCS. As network operator and maintainer, we worked closely with the suppliers and train operators once the system was operational to undertake asset reliability analysis and a programme of modifications to meet the system performance targets.

ETCS National Integration Facility

Network Rail have designed and commissioned the ETCS National Integration Facility (ENIF) at Hitchin, Hertfordshire in the UK.

Equipment from a number of ETCS suppliers has been installed in the laboratory including interlockings, RBCs (Radio Block Centres), train simulators and trackside simulators. Coupled with that, a section of the Hertford Loop has been resignalled so that it can be operated as an ETCS test track.

This allows us to carry out testing and develop operational scenarios without the need for access to the operational railway, reducing project risk and cost.

There may also be the opportunity for other railway networks to undertake testing at our laboratory.

Thameslink Project

Network Rail's Thameslink Project is undertaking a major upgrade of the north – south route through Central London, to meet the increased passenger demand of the growing network. This project, due for completion in 2018, is a huge undertaking, with major works at many sites, most notably including the complete remodelling of London Bridge Station.

In order to achieve the train service requirements of 24 trains per hour through Central London, ETCS Level 2 is being overlaid on the conventional signalling system, with the addition of ATO (Automatic Train Operation). Network Rail undertook a study and determined that ATO was the most suitable solution for the service requirement of 24 trains per hour.

This was a new application for ETCS and required technology development. Much of the testing will be undertaken in our laboratory which will enable us to test and refine the ATO parameters to minimise the need for access to the operational railway.