Fenix RAIL SYSTEMS

Northampton Gateway

Case Study 2024

The Mission

Fenix Rail Systems was approached by Winvic and their client SEGRO to deliver an innovative Intermodal train control system that would interface with the mainline 1990s Solid-State interlocking, a new rail freight terminal connected to the Northampton Loop of the West Coast Main Line. This project came with several challenges which Fenix would be expected to resolve as part of the design development. The first of which was connections to and from the Northampton Lines to the Northampton Gateway Rail Freight Interchange (NG-SRFI) would be provided by 40mph turnouts off the Up Northampton at the north and south ends of the NG-SRFI with corresponding crossovers between the Up Northampton Line and the Down Northampton Line. The permissible speed would be reduced to 30mph for the Reception Lines, 5mph for the Intermodal Lines, and 5mph for the remainder of the NG-SRFI layout.

The project would provide an intermodal rail-road interchange, receiving trains of intermodal containers from UK ports and other rail freight interchanges and also bulk commodities. Facilities would be provided on-site for unloading and loading rail vehicles for forwarding to other rail freight interchanges, and shipping products to customers on-site and into the surrounding area by road.

Northampton Gateway will ultimately handle a maximum of sixteen daily trains (in and out). Initial demand, however, will require the facility to accommodate four trains per day (in and out) and consequently, the facility would be constructed and commissioned in a phased manner to reflect the growth in demand.

Two Phases have currently been planned. Phase 1 comprised of the following and Fenix Rail Systems would deliver all signalling detailed design and train control systems and include installation, integration, testing and commissioning elements.

- Reception Lines 2 and 3
- Intermodal Lines 2 and 3
- North Headshunt
- South Headshunt
- Cripple Siding
- Aggregate Siding
- Terminal Control Centre and all site facilities

While Phase 2 will involve the addition of:

- Reception Line 1
- Intermodal Line 1
- 3 additional sidings.

The Network Rail signalling in the affected area is controlled from the Northampton workstation at Rugby SCC by a WS3A SSI-type interlocking. The Network Rail signalling equipment is locally controlled via TFM's from Roade SSI. The signals are four-aspect Dorman LED type. AzLM-type axle counters are utilised for train detection on the main lines.

The Challenges

Our clients, Winvic Construction and their clients SEGRO selected Fenix Rail Systems to deliver a control system that would interface with the mainline SSI interlocking. The issue for Fenix was the mainline system being a Solid-State Interlocking SIL 4 rated would need to interface with the chosen system PINMOVIO by Pintsch which is not SIL 4 rated but was developed and approved according to Requirements Class AK5 of the former German Standard DIN V 19250. Regarding the safety level, the Requirement Class AK5 is similar to Safety Integrity Level SIL 2 of the CENELEC standards. Being an equivalent SIL-2 safety CBI interlocking system, the Pintsch system needed to interface with a mainline SIL 4 interlocking therefore Fenix would need to develop an interface to enable the two systems to communicate and interface to enable seamless operations.

The Solution

The Strategic Rail Freight Interchange is controlled by a PINMOVIO SIL 2 equivalent Control System that includes a route relay interlocking (RRI) interface to the NR Mainline SIL4 Solid State Interlocking system (SSI). The signals are NR standard LED type and the point machines chosen are Wolber 400V AC three-phase machines except for the RRI interface area which are NR standard HW2121 point machines. Pintsch-type axle counters utilised for train detection in the SRFI area, except for the RRI interface area use Frauscher axle counters. Trains are controlled in and out of the mainline via a slotting arrangement between the mainline signaller and the intermodal controller. For a train to enter the facility, the mainline signaller requests a slot from the depot controller; once given, the mainline signal protecting entry to the facility is cleared for the move.

The Result

Fenix has designed and implemented the complete solution including Design installation our testing teams are in the final stages and commissioning will be January 2025. Controlled from the Terminal Control Centre (TCC) by a VDU operated by the Maritime PIC, with an operational interface to the NR Rugby Signalling Control Centre (SCC). The solution is a complete success and has provided an innovative, cost-effective and above all safe environment to operate trains on a 24hr bases. The installation and commissioning were undertaken under a multidisciplinary worksite and environment. Complete collaboration was achieved by planning and implementing a robust strategy and planned site activities. During implementation, the worksite was classed as a construction site and therefore enabled easy access which progressed the installation at a SteadyState, meaning possessions of the main line were minimalised allowing normal service to work around the facility build.

Key Achievements

This highly complex project had its challenges however, despite these, Fenix managed to deliver a High quality, safety-conscious design and delivery, no incidents, accidents, or close calls were reported during the site works. All design work was completed within budget. Procurement and delivery of the signalling hardware was organised on a ‘just in time ‘basis, this reduced the amount of storage required onsite, making the whole process more efficient and productive. Fenix worked in partnership with several companies to achieve a successful outcome. Fenix completed full integration of the system into the existing infrastructure.

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THANKYOU

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