

4 HV Switchgear renewals on Wessex Route

Efficiencies in the region of £500k

New Products Approved

Safeguarded the scope



Case Study

Rail E&P – Switchgear Renewal Improving certainty and efficiency

PROJECT	HV and DC Switchgear Renewals
CUSTOMER	Network Rail
LOCATION	Wessex Route - Lymington, New Milton, Ashurst, Northbrook, Shawford
CONTRACT	IP Southern Framework
COMPLETION	2021





Need

Network Rail's strategic plan for CP6 has a significant programme of Electrification and Plant (E&P) infrastructure renewals to continue improving reliability of the railway.

On the Wessex route, HV and DC Switchgear Renewals at Lymington, New Milton, Ashurst, Northbrook, Shawford and Fulwell were transferred to our E&P team with the GRIP Stage 4 - Form A complete. The priority was to generate efficiencies at the same time as resolving access constraints in some very difficult rail locked locations.

Solution

Our delivery team have a wealth of E&P capability honed within the rail industry. They are supported by our specialist design partners, and our in-house P6 Planners, possession planners and technical experts who have detailed Civil and M&E knowledge.

Reviewing the Form A with fresh eyes, identified several areas for efficiency savings which were explored and developed in consultation with Network Rail. The focus was on simplifying the site works, reducing reliance on possessions, overcoming the access constraints, and reducing future maintenance. A 'deep dive' was undertaken in conjunction with further

exploratory surveys to confirm alternative access arrangements, the location of cables, the requirement for undertrack crossings (UTX's), and equipment at each location.

As a result, savings in the region of £500k were achieved, which safeguarded the scope. The clever approaches included:

Aligning the design life

The 20T modular housings which are manufactured off-site have the switchgear pre-installed as a complete unit. The switchgear's 25-year design life was out of sync with the housing's 60-year life. The decision was taken to compromise on a 45-year life for the modules which meant the housing could be manufactured in mild steel instead of stainless steel saving circa £100k per module.

Eliminating bunds

Double skinned auxiliary transformers were adopted which eliminated traditional bund and rainwater shelters, which saved cost and time particularly on sites with difficult access and a tight footprint.

Less UTX's and Repositioning Hotsplice Joints

Our GRIP 5 detailed design surveys identified significant savings and reduced reliance on possessions by repositioning the Hotsplice joints from that specified on the Form A.

At Lymington, and Shawford, our new locations for the Hotsplice Joints eliminated the need for new UTXs, new access paths, gates and steps and simplified access and construction.

At Northbrook the repositioning of the Hotsplice from the top of a steep embankment to the bottom removed the Form A requirement for a substantial retaining structure and new access steps to track level.

These efficiencies are a direct result of the knowledge and expertise of our E&P Engineering and their willingness to collaboratively challenge the approved Form A designs.

New Products

Two new products were introduced as part of the Fulwell DC Switchgear Renewal project – The Secheron UR40 DC High Speed Circuit Breaker and the Sephcos Impedance Relay.

These products are currently going through the Product Acceptance process with the aim of a trial certificate being issued prior to commissioning. Our E&P Engineering team have supported Network Rail in developing the products, ensuring compliance with Network Rail Standards and supporting the vigorous testing process.

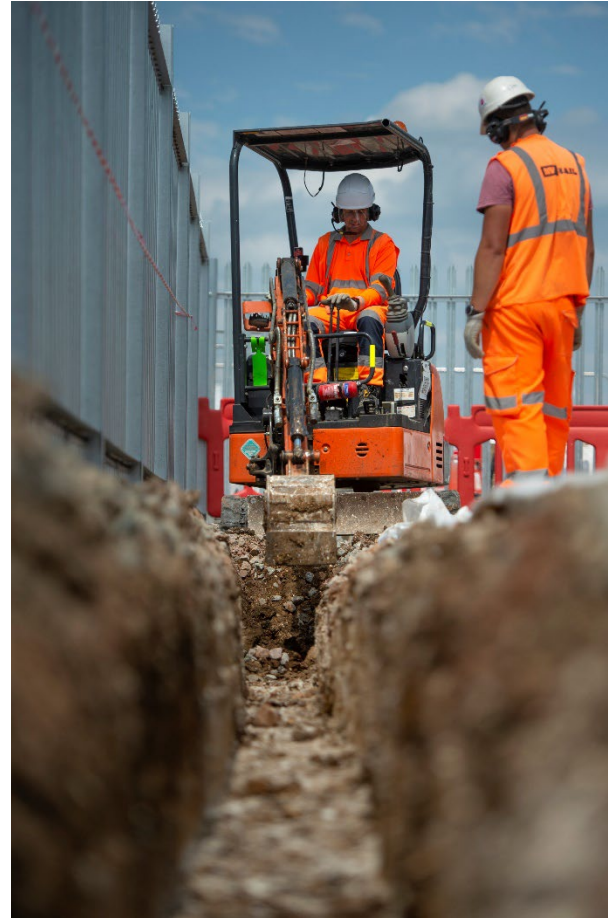
These two new products significantly increase the procurement options for Network Rail and its Contractors as currently there are only two other manufacturers and additionally the new



products offered a considerable saving over the alternatives.

Shorter Commissioning

Commissioning required several weekend High Voltage Outages but with 7 days required between outages it was not possible to use consecutive weekends leaving Network Rail's High Voltage Distribution network at risk. We proposed two options to reduce the risk 1- Install a temporary High Voltage Interconnector or condense the works to a five-day High Voltage outage. In consultation with Network Rail, it was agreed to plan the works around a five-day High Voltage outage reducing the risk to the operational network and removing the additional abortive cost of installing a High Voltage Interconnector Cable at each site.



Outcome

The integration of E&P specialists into our civils capability and experienced in-house technical experts has produced a strong offering with the diverse skills needed to move the most difficult projects forward efficiently and effectively.

On the Wessex HV and DC switchgear renewals, this multi-discipline team have overcome many of the access issues through clever civils solutions and through changes to the E&P design to reuse UTX's, rescope the works and gain new product acceptance. In this way we have generated significant efficiency savings to unlock the projects and safeguard the budget.

