CASE STUDY

RJ POWER RAIL

Collaborative Engineering Solutions

Scheme East Feltham Depot

Location Feltham, London

Client Volker Fitzpatrick

Completed May 2021

RJ Power Rail Limited successfully secured a two-year contract with Volker Fitzpatrick in 2019 to install, test and commission the High Voltage Power, DC Traction Power and E&P Assets for the new Feltham Depot.

The new Feltham Depot formed part of Network Rail's Feltham Re-Signalling Scheme and was built for the revised Southwestern Railway passenger train timetable. The new depot provides a brand-new, start of the art stabling facility for up to ten trains, including Bombardier's new class 701 rolling stock, which replaced some of the existing First MTR rolling stock fleet.

As part of the project, 4km of new, bi-directional (arrival/departure) track was built including ten roads and aprons, with a new carriage wash machine, and an automatic vehicle inspection system constructed.

A third rail 750kV DC conductor rail system was also installed throughout the depot, along with specialist servicing and train washing equipment and accommodation buildings, all which incorporate sustainable, and future proof technology.

RJ Power Rail's works required careful stakeholder planning and coordination in conjunction with Volker Fitzpatrick and the many interested parties involved.

RJ Power Rail Limited was therefore, delighted to have commissioned its programme of works to meet both Network Rail's and Southwestern Railway's desired project outcomes, within the desired timeframe.

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PROJECT DELIVERABLES

The project scope covered the procurement, installation, testing and commissioning of the following assets to create a new primary depot supply for the new rolling stock.

Pre-commencement stage

- Undertaking site surveys of the existing Feltham and Hounslow substations.
- Dilapidation surveys of the existing infrastructure assets.

Design stage

RJ Power Rail were not directly responsible for the design but undertook the role of specialist advisor to support Volker Fitzpatrick to develop the electrical design on the project utilising our experience and expertise on railway electrification projects. RJ Power Rail helped to ensure that all engineering deliverables from design through to on-site installation were carried out in compliance with the relevant NR standards and the contract requirements.

Having a competent team with existing and developed relationships with the Network Rail Project Team made the relevant design approvals a much slicker process. All associated designs i.e., SCADA, HV, DC Traction and E&P were supported by RJ Power Rail's in-house engineering team.

Implementation stage

The scope of work had several key deliverables which relied on the experience of safe design, operations, and a competent works delivery team:

- Procurement and construction of the substation 33kV HV Module, HV/LV auxiliary transformers and changeover panel, Transformer Rectifier units, substation's DC Module and the ETE discipline, and earthing and bonding.
- Engagement of a Construction CRE to manage the engineering assurance process - NR/L2/INI/02009.
- Extensive planning and staging of the substation delivery with the client, the client's stakeholders, and all disciplines to ensure safe works delivery.
- Installation of new conductor rails within the depot and mainline.
- Installation of all new ETE assets, including DC Track feeder cables from new 750V DC Switchgear to the siding Track Disconnector Switches and conductor rails, Negative feeder cables from new negative busbar to negative advance plates.
- Installation of new Negative Short Circuit Device (NSCD) to provide a short-circuit path between conductor rails and the negative return to protect against the inadvertent re-energisation of the circuit during isolation.
- Installation of signalling power supplies, from the LVAC panel to signalling power pillar and main feeder cable to new location cases.
- Installation of new Points Heating equipment and main DNO intake supplies.
  33kV Feeder F477 - Hounslow Junction, Feltham, was diverted into the new substation to provide an HV power feed to the new sidings.
- 33kV 185mm² XLPE cables were installed, terminated, phase checked, and pressure tested between the HV switchboard and main/auxiliary transformers.
- The new HV switchboard, auxiliary transformers and LVAC panel at the Substation were pre-tested and commissioned.
- 60No core GLE pilot cables were installed between the pilot box at East Feltham Substation and the trackside jointing positions to Feeder F477's pilot via a UTX's and terminated at the substation.

- SCADA RTU was connected to data lines and pre commissioned back to Raynes Park ECR.
- Implementation of all ITPs, Commissioning Plans and Switching Schedules.
- Provision of all handback information including as-builts, O&M Manuals, Design documentation, Safety Information, Post-Construction information and H&S Files.
- 33kV Substation commissioning into operational service.

CHALLENGES AND SOLUTIONS

Critical planning

Given the nature of the works, a detailed programme was developed to incorporate not just the on-site activities but also the on-track deliveries.

Using our in-house engineering and construction experts, RJ Power Rail Limited created an experienced project team to meet and deliver the requirements of the project. During the lifetime of the project RJ Power supported works covering forty-five possessions of the mainline route into London, delivering critical infrastructure upgrade works on time and without delay on every occasion.

Multi-functional works

Due to the complexity of the substation element of works, our project team had to work in conjunction with many key stakeholders such as Southwestern Railway, Volker Fitzpatrick, Network Rail (Maintainer and Route Asset Management teams), Raynes Park Electrical Control Room and Network Rails' Asset Protection Team (ASPRO). This required high levels of collaboration and understanding to ensure the commissioning solution was both safe, correct and to programme. This also involved integration of new equipment on to the operational infrastructure led and managed with support from RJ Power Rail's extensive and approved supply chain.

Design interface

In our role as specialist contractor supporting all the various project designers, our design and engineering team had to consider the necessary interface between the Signalling and SCADA - which was achieved. It was made even more challenging, as the SCADA interface had to consult with the National SCADA programme to ensure projects were not duplicating and creating unnecessary works.

Logistics management

Delivery of plant and equipment is always challenging on or about the rail infrastructure, however, we meticulously managed the delivery of modules over several staged weekends. This was developed through our rail team developing a liaison plan for interface with residents and corporate business owners affected by the works.

RJ Power Rail's detailed stakeholder management plans provided a platform for an open and honest approach to delivery and updated these regularly to keep parties abreast of the programme timeframe. This included plans for rectifying any maintenance infrastructure issues that the landowners had.

RJ Power Rail Limited has received consistent praise throughout the contract for its communication with both landowners and other project stakeholders.

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Additional challenges

COVID-19 impacted the construction industry in multiple ways, including new health and safety measures, supply chain issues, and a halt to planning and inspection timetables. New Government guidelines, childcare issues, and social distancing rules made commercial construction challenging to continue as well as many other construction projects.

Our client supported through the pandemic providing additional welfare and office facilities, COVID Marshalls to support social distancing, deep clean of all facilities which provided a more secure and comfortable environment for our team to work safety and supported any supply chain issues that occurred.

Phil Wood, VFL Project Manager and his team did a fantastic job to keep this project on programme and within a safe environment for all staff.

TESTIMONIAL(S)

"I wanted to give my thanks and appreciation for what you have delivered. It is not only over the last week or two but in all the planning and everything leading up to this point, the culmination being the delivery of the commissioning of the mainline Rail systems on the project without accident or incident which is obviously at the forefront of everything we do.

"It is not only the commissioning, which was a huge success this past week though, RJ Power brought into service the DC side of the sub-station. This element of the project has been an unbelievably challenging and intricate area with a huge interface with the mainline and the new Scada system which has been worked through to completion successfully by John and his team...

"Credit to everyone involved it really has been a truly collaborative effort...

"Thank you to you and all your team at RJ Power, brilliant effort by you and your men on the ground, well done."

Phil Wood
Project Manager, Volker Fitzpatrick