



PROJECT Refurbishment of 2 No Existing 6.6kV/433V Substations
LOCATION Victoria & Albert Museum, London
COMPLETED August 2018



RJ Power Networks' (RJP) team has completed a total refurbishment of 2 No existing 6.6kV/433V substations at the Victoria and Albert Museum (V&A).

The existing HV switchgear within substation B at the V&A was past its operational life cycle and obsolete in regard to obtaining spares. The upgrade works to the substation were designed to form part of the reinforcement of the existing HV network to accommodate any future site load increases.

The V&A is the world's leading museum of Art and Design, housing a collection of around 2.3 million objects spanning over 5000 years of creative history. The museum attracts visitors from all over the globe and is an iconic part of London's make up. We are proud to have been chosen to deliver this project for them.



PROJECT DELIVERABLES

The overall objective of the project was to replace all the equipment to the very latest specification to be able to accommodate any future load increases, with the minimum of disruption to the V&A's busy schedule.

RJ Power Networks proposed solution included the following works:

- 🌀 All associated High Voltage Switching to ensure minimal interruption to the museum
- 🌀 Phased removal of existing switchgear
- 🌀 Organisation of adequate red route road closures
- 🌀 Organisation of entire lift and shift activities
- 🌀 Carry out all associated fabric works to aid in a smooth deliver for the lift and shift aspect of the project.
- 🌀 Organisation of the manufactures attendance to site to build, test and commission the transformers and ring main units
- 🌀 High voltage cable replacement, terminations and associated pressure testing
- 🌀 Associated low voltage cable works
- 🌀 Upgrade of the substation earthing system to ensure adequate resistance to earth
- 🌀 Installation of substation EPO circuit
- 🌀 Associated Site Acceptance Testing
- 🌀 Upgrade of substation lighting
- 🌀 Substation compliance works (first aid kit, appropriate Health and Safety signage etc)
- 🌀 Painting of substation walls, ceiling and floors
- 🌀 Safe removal and disposal of hazardous waste
- 🌀 Issue of Operations and Maintenance manual on job completion



THE CHALLENGES AND SOLUTIONS

The project duration was four weeks and at no time was the public access to the museum to be affected, as it was scheduled to run over a school holiday which is peak footfall times for the museum. With this in mind, there was only allowance for minimal shutdown times, with each shutdown to be completed overnight on Sunday to the early hours of Monday morning - with one shut down providing the Networks team only two hours to complete all live testing, commissioning and HV switching.

The logistics of the project meant the project was extremely challenging, the team had to work with the equipment suppliers and our logistics and plant movement company, DSM Ltd, to create a bespoke installation solution involving multiple challenging lifts with a crane - with little room for error (40mm). This also proved challenging when it came to the transportation of the team's own materials and equipment down to the moat.

The use of the crane for the project required two road closures of Cromwell Road to be able to operate the crane safely, however the scheduling of the road closure took extensive prior planning and cooperation between RJ Power Networks, Royal Borough of Kensington and Chelsea council and the museum to be able to organise a date and time that suited all parties. Both road closures were a success and the lift and shift completed by DSM Ltd was outstanding.

As a result of the tight space and unique installation plan, the RJ Power Networks Team had to organise the two transformers to be shipped and delivered in parts. Each transformer had to be manoeuvred through a single door opening with 20mm clearance. The manufacturers were then required to attend site to build, fill with oil, commission and hermetically seal the two transformers in situ within the substation at the V&A Museum.

RJ Power Networks teams' extensive planning and preliminary works that took place enabled the project to run without delay or failure, the team were successful implementing this plan and as a result the job ran smoothly.

Special praise to Callum Turner the lead Project Engineer, for the well organised and executed job. The Victoria and Albert Museum job was completed to the high standard that is both expected by our client and always delivered by the RJ Power Networks team.



TESTIMONIAL

"The V&A museum commissioned the design of a complete refurbishment of 2 No existing 6.6kV/400V substations. RJP provided pre-construction advice and supported the client's design team during the design development stages of the project.

"Following the contract award, RJP were quick to mobilise and provide the necessary CDM advice and documentation. The projects' budgetary constraints meant that it was necessary to separate the equipment procurement from the execution of the works; which RJP supported and delivered the project over two financial terms.

"RJP; unprompted provided all necessary construction documentation to the clients team; avoiding the need for a protracted approvals process at the critical stage of the construction programme.

"The installation of the transformer was a challenging operation and RJP worked with their logistics company to provide a bespoke equipment installation solution; meeting the requirements of the local authority and addressing the client's concerns with respect to the moving of equipment close to the listed building fabric. The Midel filled Transformers were installed in the constrained substation in modular form and reassembled by the specialist equipment supplier; who provided full testing certificates.

"The installation of the 2 No. 800kVA Transformers and associated Ring Main Units was executed and delivered on time and on budget. Importantly the replacement of the equipment resulted in only a minimal programmed isolation of the electrical supply to the building."

Mark Freeman
JRG Electrical Consulting

WHY RJ POWER NETWORKS?

RJ Power Networks undertakes a range of installation and maintenance works, from control cabling through to the provision of high voltage ring-main systems in private distribution networks, as well as maintaining existing HV equipment, making us the ideal company for this project.

We continually strive to offer a consistent and reliable service to all of our clients and future clients, as Networks is a business led by passionate individuals that care about quality, environmental processes and procedures and developing collaborative and sustainable partnerships, with the ultimate goal of securing customer loyalty and forging strong long-term business relationships.