

CASE STUDY

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Contract Details

Client:

First Engineering / Babcock Rail /
Network Rail

Location:

Essex, Kent, Surrey

Principle Works:

Bypass in-service substations.

Removal of old metal clad
switchgear.

Install new Areva WSA
switchgear.

Commission and switch into
service.

Remove old battery system install
new charger systems and
commission into service.

Replace auxiliary transformers
with a new higher rated cable
feed types.

Replace old wall mounted
signalling switch supply with new
Signalling Supply LVAC change
over panel.



Awarded to WJ Project Services by Network Rail, Major Projects and Investment in January 2008, the 50-year-old GEC KC switchgear that was installed at the time was under stress from increasing power demands and the system was suffering from a vital reduction in a key necessary network component - the network outage availability. Network outage availability is essential to the overall system as it's required for the maintenance and ongoing smooth-running of the railway system, as well as crucial and fault identification. With increased power demands and reduced availability during network outages, the system already in place was simply not sustainable and needed to be upgraded to accommodate increased usage.

A new Areva WSA GIV switchgear was put into commission to replace the metal clad switchgear that was currently installed. The Auxiliary Transformers and Signalling supply LVAC equipment associated with the switchgear was also upgraded in order to increase the efficiency and power of the system, while also increasing network outage availability for maintenance.

As part of a renewals programme for 33/11kV oil filled switchgears, to keep in line with the power demand increase being exerted on the system, Network Rail Major Projects and Investment was in need of 14 HV substations within their South East Territory. The switchgear renewals programme would see the expired metal clad switchgears replaced with the new Areva switchgear at each substation.

Each of the 14 locations underwent an initial assessment to ascertain the operational impact of isolating and replacing the old switchgears with minimal disruption to existing train services while allowing the railway infrastructure to be upgraded in terms of power, safety and simplicity.

The WJ Project Services team worked

tirelessly to modify and verify the designs of the new systems and also supervised the removal of the old switchgears and the installation and commissioning of the new equipment.

The initial work required the in-service substations to be bypassed, often requiring the installation of an intertrip scheme, which was connected to a remote-end-feeder circuit breaker. This new installation allowed both the rectifier transformer and auxiliary transformer that were currently on-site to continue feeding the network as needed.

The bypass involved applying new settings to the translay zone protection relays in order to offer protection to the feeder zone, while work began on cutting and joining existing feeder cables to initialise the bypass.

Once the bypass was completed, the old, end-of-life switchgear was replaced with the new Areva WI Gas Insulated Vacuum which was erected in the footprint of the old, metal-clad switchgears. All existing equipment was then connected and vigorously tested by experienced engineers in line with the Network Rail testing standards, with all SCADA interface and supervisory testing actions and procedures carried out in the relevant control rooms.

Further commissioning work was then carried out, which saw the auxiliary transformers, battery systems and LV automatic changeover panels replaced. After the equipment was all in place, the bypass on the system was removed and new switchgear and ancillary equipment was switched into full service.

The success of this project was attributed to the detailed and professional coordination of activities and services by WJ Project Services throughout the duration of the works, and at each individual stage, as well as our ability to effectively and efficiently manage each step of the project with astounding engineering expertise and capability.