

# KENT POWER SUPPLY ENHANCEMENT (PSE) - PHASE 1



## BACKGROUND

The project addresses the requirement to upgrade the E&P infrastructure on the north and mid-Kent lines to meet the Train Operating Company's (TOC's) aspiration to run 12-car trains, increasing capacity by 20% from the current 10-car units.

Phase 1 enhances the infrastructure to cope with a limited number of 12-car Class 465 units on the lines between London and Gravesend, London and Hayes, and London and Sevenoaks. The works are designed to achieve a 750V route setting.



## SCOPE

To provide a 7.5kA route setting and a traction voltage uplift to 750V on the DC third rail. This included the refurbishment and upgrading of 22 substations, Traction Paralleling Huts (TPHs) and 48 sections of Electrical Track Equipment (ETE) and DC track cabling re-enforcements. This required around 70km of cable and many other electrical works, operating on a short timescale at over 70 sites.

### Substations and Traction Paralleling Huts (TPHs)

- 33kV switchgear – three panel HVCB suite
- Transformer rectifiers – 3MW Class G
- 750kV switchgear – switchgear resistor change, 4kA DCCBs, 6kA Main DC and cables to rectifier; 8kA Main DC and cables to rectifier
- Protection equipment – overload changes to new route setting, decommissioning and removal of MITS equipment, increase rectifier protection; impedance protection and frame leakage
- SCADA – new RTU, update existing RTUs
- Battery chargers - new TPH, DC switchgear, HV switchgear and rectifier
- LV equipment – supply to new TPH; 70kA 33kV/415V auxiliary transformer
- New or diverted LV supply
- New positive (1000mm) (240mm) and negative (800mm) cabling
- UTX for CMS
- TPH module base

### Enhanced ETE

- Replacement of VIR and VB cables, CAD welded cables and degraded

(bubbled) insulation cables

- Sections of positive jumper cables doubled (except floaters)
- SRTC sections reinforced and Type 0, 1 and 2 impedance bonds replaced by Type 3 bonds
- Cable management in rebated sleepers
- UTX placed where required in multi-track areas

## CHALLENGES

This very significant programme of works had to be achieved in a very tight timeframe, with over 70 work sites to be surveyed, design and consultation to be carried out, planning secured (Section 61) where needed and agreed works undertaken.

A 'one team' approach helped considerably in meeting the fast track pace; facilitated by co-location of Network Rail, UK Power Networks Services and the delivery supply chain at our Chatham office.

## ACHIEVEMENTS

- Rapid mobilisation and set-up of integrated project management office with supply chain
- TPH works started in week three
- First new DC switchgear commissioned in week ten
- ETE started in week three

## KEY STATS

70+  
sites



22 substations  
upgraded/  
refurbished

48  
ETEs  
upgraded/  
refurbished

## CONTACT

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