

North West Electrification Auto-transformer Project



Case Study: HV GIS Auto Transformer Substation Commissioning on the West Coast Mainline

Client: Siemens / Network Rail / Balfour Beatty

Project Partner: WJ Project Services

Location: West Coast Mainline, Chat Moss Route – Willow Park & Ordsall Lane

Scope: HV GIS auto-transformer substation commissioning, RATS and IEC 61850 testing, SCADA integration, and infrastructure verification



Project Overview

WJ Project Services supported the North West Electrification Programme to reinforce infrastructure on the West Coast Mainline and electrify the Liverpool–Manchester route. Phase 1 included installation of two auto-transformer distribution substations at Willow Park and Ordsall Lane.

Approach

Works involved testing and commissioning two Siemens 8DA12 GIS auto-transformer substations, including Rationalised Auto Transformer Scheme (RATS), IEDs, IEC 61850 network systems, and SCADA integration. HV soak testing, section proving across 26km of new electrified infrastructure, short-circuit testing with VL and VT monitoring, and feeder transfers were completed.

Commissioning & Training

The traction system was upgraded from a 6kA to a 12kA 25kV–0–25kV auto-transformer configuration. Section proving and fault simulation testing using GPS-linked Omicron equipment verified protection performance prior to energisation.

Equipment

Siemens 8DA12 gas-insulated switchgear, SIPROTEC and Schneider protection relays, and IEC 61850 networked control systems were deployed, providing advanced protection and resilient traction power supply.

Outcome

The project delivered fully commissioned auto-transformer substations and verified protection systems, strengthening electrification infrastructure and enabling reliable operation of the upgraded Liverpool–Manchester route.

