



Case Study: National Grid Kearsley 275kV Substation

Summer 2006 provided **WARDPOWER** with an opportunity to demonstrate an unquestionable level of design expertise, project management, testing and absolute determination in the extension of the LVAC scheme at NG Kearsley 275kV Substation...

The MVAC switchboard (main incoming LV supplies board) at NG Kearsley substation was comprised of two Super Grid Transformer (SGT) supplies and a relay based auto changeover system with a number of outgoing circuits. The basis of our works was to extend this 30 year old board with a supply from the recently installed **WARDPOWER** 656KVA Generating Set. To add an interesting twist, and a little pressure, neither of the SGT supplies had an upstream point of isolation so almost all works were to be performed with the switchboard live.

The works were performed under the Construction (Design & Management) Regulations 1994 with **WARDPOWER** undertaking the roles of Designer and Principal Contractor.

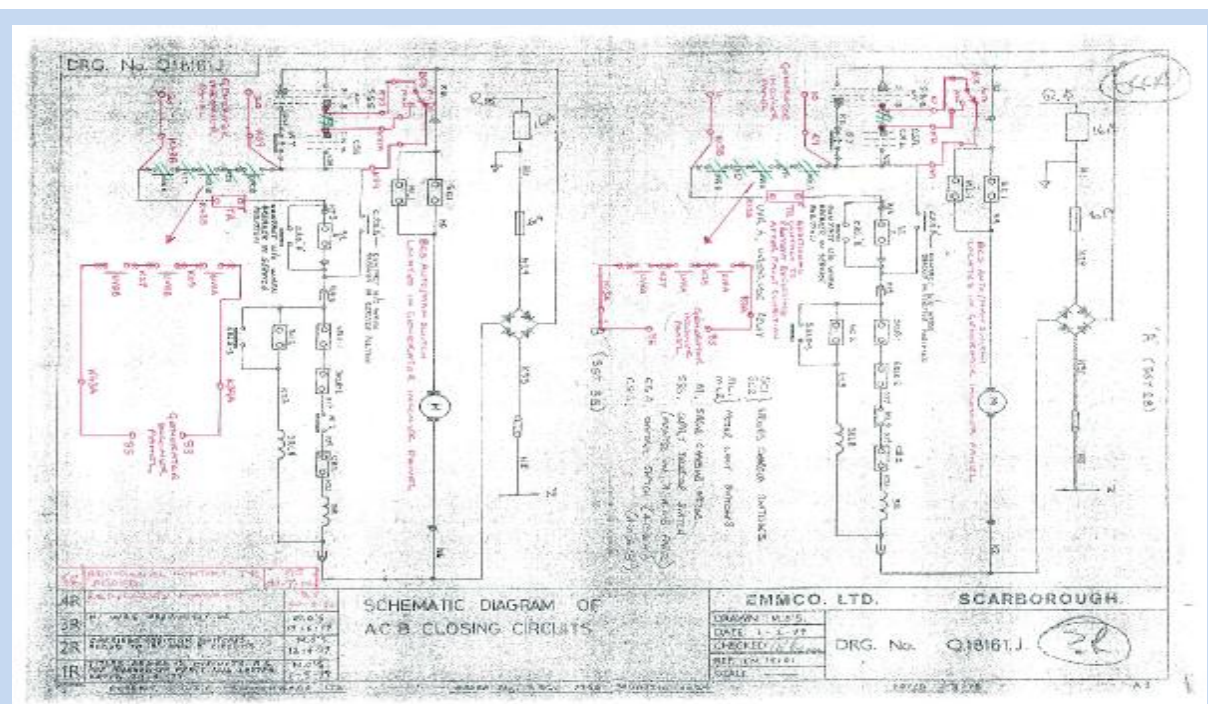
The exhaustive design process involved thorough examination of the existing switchgear and its drawings and full verification of all protections and the existing changeover scheme. An extension panel was designed and all the design details, step by step modification method statements and red/green marked up drawings were submitted in advance in a comprehensive Design Intent Document. These were then subject to a rigorous client and consultant approval process.

The overall design and build project package comprised the installation of the new Generator extension panel, trenching, ducting and re-surfacing of cable routes, the reconfiguration and extensive re-cabling of the existing generator changeover scheme, the removal of an old generating set, the replacement of an existing LV essential services switchboard and the re-cabling of the overall LV scheme to ensure the Generator supply covered all the 'essential' and 'non-essential' circuits.



*Ok, so it's the Wrong Colour...
The existing MVAC switchboard built
in 1978 extended with the new
generator supply panel (they asked for
the colour by the way...)*

As the site works began, the extension panel was positioned alongside the existing switchboard and wiring prepared in anticipation of the outage of the SGT's with the cables and busbar chamber live. A team of highly skilled wiremen, the Design Engineer and the Project Manager were on site ready to start the modification works as soon as authorisation was given from the NG Control Centre. A 4 - 8 hour window was authorised on the basis of a 2 hour return to service if absolutely necessary and the works commenced. On completion, each wire was tested to prove the installation prior to the restoration of both SGT supplies. The new auto changeover scheme was still to be commissioned and after the connection of the generator supply into the new panel the commissioning process began. Witnessed by the Site's Senior Authorised Person, the three incoming supplies were functionally tested by our Lead Commissioning Engineer and then black start tests ensured that the auto changeover system worked and that the entire site had full system back up with two SGT supplies and the new Generator supply.



*Imagine Manchester with no Burglar Alarms...
 A level of detail is necessary to avoid this! Site Red/Green modifications to existing switchgear drawings showing wire-by-wire every modification to be made. These paired with wire-by-wire Method Statements and Test Protocols. All works were done with the board live.*

The works then continued with the migration of various essential service supplies to a new LV distribution board, each circuit being fully prepared prior to disconnection, minimising outages to between 10-30 minutes per circuit. Finally an existing essential services switchboard was re-connected onto a newly available fused switch from a non switched supply, performed under task lighting and against the clock to ensure minimum disruption to the essential services.

- Project in Brief:**
- Principal Contractor and Designer under the CDM Regulations
 - Modification and extension of existing site Switchgear
 - Full design of the new interface including wire-by-wire modification planning
 - Supply of new LVAC distribution equipment
 - Civil works
 - Installation works including mating of switchgear extensions and migration of LV circuits to the new board
 - Commissioning including primary injections, functional tests and re-commissioning of existing equipment



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