

Inete Case Study: HV and VVVF Pump Station Upgrade

The Project:

Bingegang Pump Station is a high lift pump station in BMAs water pipeline network. The pump station consists of two separate sheds. The Capcoal Shed houses two high lift pumps and the BMA Shed which houses three high lift pumps and the controls for two submersible pumps. In mid 2015 the BMA Shed was overhauled to allow for variable speed control of three high lift pump motors. Throughout the overhaul the pipeline had to be kept operational to supply water to the pipeline network.

The works included the replacement of the pump station high voltage switchboard, replacement of low voltage switchboards, installation of new high voltage transformers, installation of new high voltage variable speed drives and variable speed drive room.

Inete was engaged directly by BMA to work with them and the other contractors involved with the upgrade to manage the upgrade works and ensure the best possible outcome for the upgrade.

Pre Shutdown Planning and Procurement:

- Selection and procurement of the high voltage switchboard, high voltage transformers, variable speed drives and variable speed drive room.
- Design and procurement of the low voltage switchboard.
- Design and selection of the PLC and Control network.
- Preparation of the cable schedule.
- Preparation of the For Construction Electrical Schematics for the upgrade.
- Preparation of the Scope of Works for the upgrade and obtaining quotations for the upgrade works to be carried out.
- All PLC and SCADA programming associated with the upgrade.



Project Overview

Project

BMA Bingegang Pump Station VVVF and HV Upgrade.

Location

50 km South of Middlemount in Central Queensland.

Infrastructure

- Three (3) 525 kW 3.3kV High Lift Pumps controlled by Siemens VVVF Drives
- Two (2) 250 kW 3.3kV Submersible Pumps
- Two (2) 22/3.3 kV 2.5MVA Transformers
- Two (2) 22kV/415V 250KVA Auxiliary Transformers

Project Scope

Major works included:

- Installation of new Siemens VVVF Drive Room
- Installation of new Siemens HV Switch Board
- Installation of new Low Voltage Distribution Board
- Installation of new Auxiliary Transformers
- Upgrade of PLC and SCADA controls

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Installation of new drive room:



Installation of new switchboard platform:

Shutdown Works:

This was an onsite role for the duration of the upgrade.

- Monitoring of work being carried out to ensure they comply with the scope of works and relevant standards.
- Technical assistance with site electrical works.
- Updating of electrical schematics and cable schedule information.
- Identification of improvements and assistance with changes to the scope of works.
- Monitoring of work progress against work schedules.
- Managing of site works and different contractors involved in completing the upgrade scope of works.



Project Close Out:

The final close out of the project and handover of the pump station to the maintenance and operations team involved:

- Gathering handover documentation for the project.
- Final updating of Electrical Schematics to As Built status.
- Final testing of PLC software and SCADA control functions.
- Preparing spare parts listings and recommendations of maintenance activities.
- Training of maintenance personal.



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