Inete Case Study:

Pump Station HV Protection & Earth Studies

The Project:

Bingegang Pump Station is a high lift pump station in the Central QLD water pipeline network. In mid 2015 the pump station was overhauled to allow for variable speed control of three high lift pump motors. 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 to carry out a high voltage protection system study to determine the protection settings required for the existing and new equipment. In conjunction with this Inete was also engaged to carry out an earthing system study to determine step and touch potential limits and to design the new earth grid system for the site.

Project Works:

- Analysis of HV fault levels and protection requirements leading to the preparation of a HV Protection Study Report;
- Implementation of the HV Protection System Study Report recommendations in terms of protection relays settings for all incomers and motors;
- Final testing of all protection relay settings to confirm correct operation of the protection systems;
- Site soil testing and measurement of touch and step potential limits;
- Preparation of Earth System Study report;
- Implementation of the Earth System Study report recommendations including extending the switchyard earth grid and installation of new earth cables.

Project Overview

Project

Bingegang Pump Station Protection & Earth Study.

Location

50 km South of Middlemount in Central Queensland.

Infrastructure

- Three (3) 525 kW 3.3 kV High Lift Pumps;
- Two (2) 250 kW 3.3 kV Submersible Pumps;
- Two (2) incomer protection relays SIPROTEC4 7SJ8042;
- Six (6) motor protection relays SIPROTEC4 7SK8062;
- Two (2) Nulec pole mount N Series Reclosers;
- Two (2) 22 / 3.3 kV 2.5 MVA Transformers;
- Two (2) 22 kV / 415 V 250 kVA Auxiliary Transformers.

Project Scope

Major works included:

- HV Protection Study and setting of all protection relays;
- Implementation and testing of all protection settings;
- Earth Study and design of the earth grid for the pump station.

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