POWER CONTROL ENGINEERS

Case Study – Providing Statutory Electrical Engineering Role to a Quarry

Power Control Engineers has been engaged to provide the statutory electrical engineering roles for mining clients. The statutory role encompasses a range of activities. This document summarises some of the services provided for an individual client.

On engagement by the client the first task required was the creation of the Electrical Engineering Control Plan (EECP). The intent of the EECP is to set out how the mine operator will manage the risks to health and safety associated with electricity at the mine. During the creation of the EECP several areas were raised that required further attention. Power Control Engineers assisted the client in these areas as follows:

1. The general condition of the site electrically

PCE completed an audit and found various issues. PCE worked with the mine to establish a schedule to prioritise works so that the non-conformances could be rectified.

2. Arc flash

A main switchboard at the site had high arc flash incident energy levels. PCE assisted by reviewing and verifying the results of the arc flash study. The next step was applying administrative controls as an interim measure. This would allow mining operations to continue.

From this point PCE worked with the mine and presented engineering solutions as options to the mine. PCE assisted with the execution of the selected solution, which was the installation of a new circuit breaker with remote operation and the installation of an arc flash detection system which tripped the main breaker.

3. Earthing

The site had High Voltage (HV) infrastructure and therefore the requirements around earthing are somewhat more stringent. Investigation into the history of the site found that the earthing system had been designed properly at the time of its installation. However, injection testing had not been completed to establish if its condition had deteriorated over time. PCE assisted the client in engaging a specialist to complete onsite testing and inspections.

The injection test found that some improvements where required which included a minor extension to the existing grid. PCE assisted with specifying the earth grid modifications

4. Protection Systems

There are statutory requirements to have earth leakage protection installed on a mine site. However, the suitability of the protection systems to protect persons had not been considered. PCE instigated fault loop impedance testing and calculations and found that the protection system would operate correctly.

5. Transformer maintenance

The site owned a single 11kV/433V transformer. This transformer required maintenance and the client had received some advice from a maintenance company. PCE provided guidance and advice on the maintenance required. PCE also provided guidance and interpretation of the oil sample results.

6. High voltage connection

There was an unusual arrangement with the high voltage connection to the site. PCE worked with an energy consultant to establish if modifying the arrangement could provide a cost saving and improve operational aspects associated with the arrangement. In this instance, there wasn't a business case to change the site and the project was deferred.

7. Main LV switchboard replacement

PCE assisted with specifying a new main LV switchboard. It was necessary for the switchboard specification to have references to the installation environment and compliance with mining regulations. The procurement process also involved interfacing with the contractor during the construction of the board and the installation.

8. Maintenance systems

The overall site maintenance system required reviewing and some improvements. PCE assisted with optimising the maintenance and providing detailed advice on specific items.

The above services where provided by a single statutory engineer from PCE. However, this engineer was backed and assisted by the PCE engineering team which has over 300 years of electrical engineering experience.

If you would like further information or would like assistance contact Power Control Engineers.

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