PRESS RELEASE

NOJA POWER®

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Mining MV Switchgear: Solved

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Safety, reliability and simplicity are essential for the performance of equipment in mining applications. With the viability of many mining projects relying on assumptions of equipment uptime, designing power systems for mining applications consider service continuity as an essential requirement.

For overhead network protection, the best investment for improving power reliability is the inclusion of Automatic Circuit Reclosers (ACRs), eliminating over 80% of overhead line outages and ensuring mines can achieve their extraction objectives.

Fortunately, technology evolution in Pole Mount ACRs facilitates their application to more protection and control roles within mining applications. From mobile substations designed to capitalize on existing overhead services, to underground cable protection, standardizing on a single switchgear module allows operators to improve their safety and efficiency through operational gains.

Mining Overhead Network Protection

Fundamentally, deployment of Automatic Circuit Reclosers eliminates 80% of faults. This impressive performance exploits the fact that most overhead line faults are transient, such as lightning strikes or foreign bodies coming in to contact with overhead lines.

While traditional protection will immediate trip to lockout, ACRs are programmed to reclose the network for two main reasons:

a) To supply a controlled volume of energy to a fault to attempt to dislodge the fault, without exceeding equipment limits.

b) To check for momentary insulation breakdown caused by lightning strikes and associated arcing.

Between these two mechanisms, operators can safely apply reclosing techniques to mitigate 80% of overhead outages.

OSM Recloser Installation at a mine in Western Australia.

Mobile Substations

Often built in collaboration with switchgear manufacturers such as POWINS, these mobile substations allow mining electrical engineers to connect to existing overhead services, eliminating major civil works costs in network augmentation.

These switchgear assemblies include all protection and control, rated up to 38kV with an interruption capacity of 16 kA, meeting the medium voltage protection demands of mining equipment protection.

Some designs include protective fencing around the switchgear, providing a level of IK rated impact protection against blast collateral. This added asset resilience mitigates outage risk in adverse environments, further improving mining asset uptime.

A NOJA Power OSM38 Recloser, surrounded by a blast cage for Mining Applications

Medium Voltage Equipment Protection

When mining equipment requires a direct medium voltage supply, protection requirements may increase. Some applications call for Sensitive Earth/(Ground) Fault protection of 500 mA or below, to protect operators and equipment from internal faults.

The NOJA Power OSM Recloser system can be specified with a high resolution SEF CT arrangement, providing a minimum 200 mA SEF configuration with 100 mA steps. This removes the requirement for auxiliary protection CT's and relays for these applications, improving reliability, reducing commissioning costs and reducing engineering time.

The connectivity of the RC10 controller can also allow for site interlocks, improving safety for operators in hazardous environments.

NOJA Power OSM Recloser installation – a Mine in South Africa

Interlocks connected to the OSM Reclosers in the Switch Yard

Capacitor Bank Switching

NOJA Power's OSM38 Recloser is type tested to class C2 for capacitive switching at 27kV, allowing the unit to be used to switch capacitors on the medium voltage grid. For networks with extensive overhead services, this allows for voltage control under fluctuations of demand, highlighted by the image below in a resources application in Algeria.

Pole Mounted Capacitor bank switching,

The OSM Recloser is considered a highly versatile asset in the electrical engineers toolkit. These basic installation applications showcase the many challenges that have been addressed with a standard product, whether it be a Circuit Breaker, Sectionaliser, Recloser or Load Break Switch application. Automation and control options are all included as standard with the OSM Recloser too, providing options for future smart grid implementation and automation of the mining electrical network.

“Our medium voltage circuit breakers are ideally suited for the harsh environments in mining applications,” reports NOJA Power Group Managing Director Neil O’Sullivan. “They are suitable for both pole mount as well as skid or base mounted applications. With our DIN profile bushings, underground cables can be terminated directly onto our bushings with dead break elbows instead of standard overhead bushing boot arrangement to allow fully insulated ground mount applications in high pollution environments.”

For more information, contact NOJA Power at www.nojapower.com.au