

Enabling mine winder operation with Merus™ STATCOM solution

Challenge

The Mungana mine, located in Queensland, Australia was deemed to cause unacceptable voltage variations in the nearby town during load changes, or in case of a sudden load disconnection event. For this reason, the local grid company forced the mine to limit its operating power until a solution to mitigate these voltage variations was installed.

An independent consultant simulated different scenarios and determined that if the mine constantly maintained a fixed leading power factor at its connection point, the voltage variations would be reduced to acceptable levels.

The mine had loads which due to their operation created fast changes in the mine's reactive power demand. This meant that traditional compensation solutions were too slow to constantly meet the power factor target.

Solution

Merus Power in co-operation with its local partner designed a solution where Merus™ STATCOM was connected together with a mechanically switched capacitor bank to form a system that could meet the required power factor target with fast enough response time to any load changes or disconnection events. Due to the harsh environmental requirements, both systems were placed in containers.

The equipment comprised the following:

- -4 - + 4 MVAR containerized Merus™ STATCOM system
 - 3 pcs Merus™ M1000-STATCOM modules
- 3.9 MVAR / 11kV MVAR containerized mechanically switched harmonic filter bank
 - 3 pcs 300 kvar steps
 - 2 pcs 1500 kvar steps

Result

The Merus™ STATCOM system was able to constantly maintain the target power factor at the point of common coupling (PCC). The capacitor bank steps were controlled by Merus Power's control and protection system to optimize the reactive power generation so that the overall compensation system losses could be minimized.

During fast load reactive power changes, capacitor step connection or disconnection events, or during sudden load disconnections, the Merus™ M1000-STATCOM modules provided dynamic reactive power response which ensured that the power factor was constantly kept at the level determined by the initial study made by the consultant. The mine was able to increase its operation power to the designed level.



Application:
Mining Industry

Location:
Australia

Power quality issues:

- Voltage variations

Merus™ Solution:
9.7 MVAR containerized
Merus™ STATCOM system



Customer Benefits:

- Increased operating power
- Power factor control according to the grid operation requirement
- Minimised system losses