

Restoring reliability of a deep-sea mining vessel by eliminating harmonic distortions

Challenge

Debmar Atlantic vessel in Namibia underwent modifications, to be able to perform deep sea mining. In the process, compressors and motors were installed, which were fed by variable speed drives (VSD). The ship operates on an island grid with power generation of 11.7MW, 600V in 60Hz.

Because of the large number of variable speed drives (VSD), a harmonic distortion study was performed at the ship. Voltage harmonics as high as 12% under mining operation was discovered. Especially high were the 3rd and 5th order. The vessel follows the American Bureau of Shipping (ABS) standard, which allows only 5% of voltage harmonic distortion. Harmonics were causing problems such as tripping of circuit breakers, overheated equipment and compromised equipment lifetime and reliability.

Solution

De Beers mining company decided to ensure the reliability of their operations by acquiring Merus™ M500 Active Harmonic Filtering system and installing it to the vessel's main switch board. The contract was accomplished in co-operation with Merus Power partner RWW in South Africa.

Key criteria in supplier selection were excellent performance, and fast delivery time. Merus™ M-series Active Harmonic Filters are built of state-of-the-art technology and provide excellent performance for both even and odd harmonics.

Merus Power's lean manufacturing philosophy allowed manufacturing and shipping in an extremely tight schedule of 3 weeks. The vessel was at port for a limited time, and the commissioning was to be done next time it was at Cape Town port.

Result

The M500 was successfully commissioned by RWW and Merus Power's engineers, during the short window of time the vessel was at port. The performance was above expectations of the end customer. Moreover, the primary objective to limit voltage harmonics under 5% limit set by ABS was successfully met with Merus™ M500 Active Harmonic Filter.

The Debmar Atlantic mining vessel is not only able to operate reliably without interruptions, but also increase the lifetime of their equipment to match that of their vessel, built in 1978.

" Together with Merus Power, we were able to provide our customer with a reliable and effective solution, in a record delivery time."

Mr. Jeremy Wood - Director
RWW



Application:
Mining and marine industry

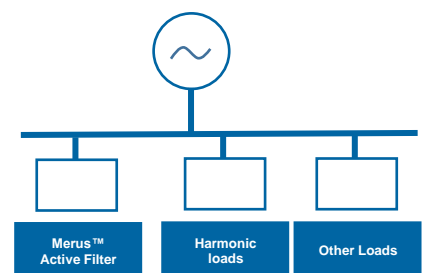
Location:
Off-shore, Namibia

Power quality issues:

- High voltage harmonics

Merus™ Solution:

- Merus™ M500 Active Harmonic Filters



Customer Benefits:

- Reliable mining operations
- Increased equipment lifetime
- Harmonics below ABS limit of 5%
- No more unexpected nuisance tripping