

Optimized power quality solutions for smooth plant operation

Challenge

Aberdare Cables factory, located in Johannesburg, was experiencing power quality problems such as high voltage, harmonic distortions, voltage variations and poor power factor. Main sources of power quality problems were variable speed drives, both AC and DC drives, as well as other dynamic loads in the plant. Harmonic distortions were clearly exceeding power quality limits defined in global power quality standards e.g. IEEE 519 1992. Whereas power factor of the plant was as low as 0.75.

Low power factor and high harmonic distortions were impacting the cable factory in several ways. Production downtimes were frequent, resulting in production losses and high maintenance costs. High harmonic distortions were causing additional heating and stress in the electrical system. IEEE scientific studies prove the reduction of a factory's lifetime up to 40% if it is suffering from high voltage harmonic distortion.

Solution

Frequent breakdown of electrical components and high operational costs were the main concerns of Aberdare engineering team. Our South African partner RWW performed the power quality audit and proposed a suitable solution to improve the power quality. Detailed analysis of power quality audit was mutually carried out by Merus™ technical team and RWW.

Analysis highlighted limitations of the existing compensation system. These included very slow response time and incapability of cancelling harmonic distortions. Merus Power and RWW designed a cost-effective hybrid solution by combining the benefits of both, conventional as well as modern technologies. Proposed solution consisted of proven Merus Power A-series Active Harmonic Filters and detuned capacitor banks.

Result

Hybrid compensation solution was installed parallel to the loads to be compensated. When commissioned, hybrid solution exhibited real time response to the reactive power needs of the dynamic loads thus constantly stabilized the system voltage. Power factor has also gone significantly up and is currently close to the unity.

A-series active harmonic filter as part of the hybrid solution, provided harmonic cancellation capability and brought voltage distortions well below 5%. Ever since commissioning in 2013, the plant has been running smoothly.



Application:
Cable manufacturing

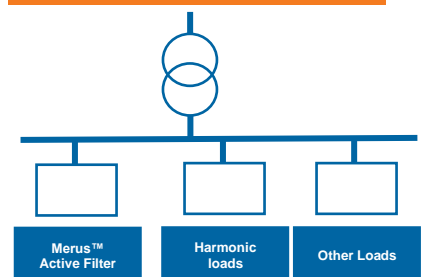
Location:
Johannesburg, South Africa

Power quality issues:

- Low power factor
- High harmonic distortions

Merus™ Solution:

- Merus™ A-series Active Harmonic Filters and detuned capacitor banks



Customer Benefits:

- Optimized solution saves money without compromising performance
- Extended plant lifetime
- Power factor close to unity
- Seamless plant operation
- Harmonic distortion below limits at all times