

Total Current & Voltage Harmonic Distortions to meet IEEE 519 in a Water Treatment Plant

Challenge

Design consulting firm wanted the newly proposed water treatment plant project compliant with IEEE 519 – 1992 limits. The plant's main loads are various pumps that were designed to be fed by AC drives. This was to achieve energy efficiency and cost savings.

Both active harmonic filtering and passive harmonic filtering technologies were evaluated. Passive filters are typically installed on individual drives and have higher losses. Furthermore, since they are system-specific solutions, any changes render them useless. Due to such drawbacks, the passive harmonic filtering option was ruled out from the design. Multi-pulse or Active Front End (AFE) drives may help comply with the standards, but as there were several loads with small ratings, multi-pulse or AFE drives were unfeasible. Standard 6-pulse drives are reliable and cost-effective solutions but create typically 30-40% distortions.

Solution

Merus™ Active Harmonic Filters can be installed to compensate harmonic distortions of multiple 6-pulse drives simultaneously, thus they are a more cost-competitive and reliable solution. Furthermore, their functionality can easily be controlled via touch-screen HMI after any changes in the system, if needed. They are easily scalable if more harmonic-producing loads are added to the network.

After these technical evaluations, Merus Power with its local partner was requested to provide simulation studies based on a single line diagram (SLD). The simulation provided information on the harmonic distortion levels before and after the suggested compensation solution installation.

Result

The delivery of the active harmonic filtering solution followed the project timeline. Measurements were performed when 6-pulse drives were put to operation, and it was discovered that especially current distortion was remarkably high and exceeding the allowed limits.

After commissioning, Merus™ Active Harmonic Filters effectively mitigated the harmonic distortion. Both current and voltage harmonics are now under the limit. Compliance with standards was successfully met, ensuring smooth plant operation now and in the future.

"We have successfully complied with the power quality standards by significantly reducing the current as well as voltage harmonics at the plant. Thanks to the impressive technology of Merus™ A2-series Active Harmonic Filters. We are looking forward to working with Merus Power and its local partner for future requirements."

Regional Sales Manager



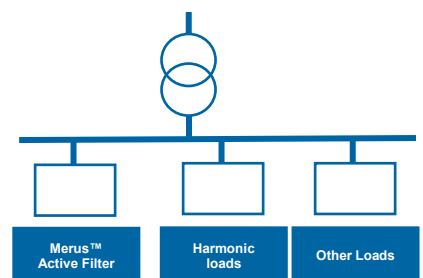
Application:
Water treatment plant with AC drives

Power quality issues:

- High current and voltage harmonics

Merus™ Solution:

- Merus™ Active Harmonic Filters



Customer Benefits:

- Cost effective harmonic filtering solution
- Successful compliance
- Customizable solution according to future loads
- Smooth plant operation