

CASE STUDY

**Edgecomb Metals
Cincinnati, OH**

Facility Description

Macsteel Service Centers USA, formerly Edgecomb Metals, is one of the leading metals processors and distributors in North America. With multiple locations conveniently located throughout North America, Macsteel Service Centers USA offers one of the largest inventories of metals in the service center industry. Macsteel processes and distributes carbon and stainless steel, aluminum and specialty metals to customers throughout North America and Puerto Rico.

Challenge

Macsteel Service Centers, USA, contacted PQI regarding a Power Factor problem at their heavy steel plate sheering plant in Cincinnati, Ohio. Their first attempt at Power Factor correction was based on their utility's recommendation. They installed a new capacitor bank with a rating based on the plant's True Power. Unfortunately, the capacitor bank failed shortly after its installation. The loads at this facility included fourteen regenerative electronic motor drives (15HP – 250HP), twelve induction motors (15HP – 50HP) and twelve large cranes, each with multiple large induction motors.

Solution

To solve these serious Power Factor and Power Quality problems, PQI undertook a detailed harmonic mitigation study. Because all drives were connected to the same 480-volt bus, our mitigation plan included phase-shifting the various groups to effect harmonic current cancellation. Drive TransFilters™ were installed at each large regenerative motor drive and at groups of smaller drives.



Impact

The impedances of these transformers were sufficient to reduce average current distortion from 72.9% THDI to 35.6% THDI. Phase-shifting the groups of drives further reduced THDI to 5.8%. At these distortion levels, the drives' average Power Factor was increased from 0.79 lagging to 0.98 lagging. Voltage distortion was also reduced from approximately 10% THD_v to less than 2% THD_v. The second step was then to add a capacitor bank, based on the DPF measurements. This final step brought True Power Factor up to approximately 0.99 lagging and eliminated the utility's PF penalties. Within weeks of the implementation, the plant was reporting a significant increase in productivity, which they concluded was a result of reduced voltage distortion at the programmable controllers.

Power Quality International is the industry leader in the development, design and manufacturing of harmonic mitigating and energy-efficient transformer technologies. With a passion for solving problems and helping customers achieve power quality and energy efficiency, PQI delivers cost-effective solutions that ensure power quality and energy efficiency for the life of their customers facilities.