



Excellent flicker and harmonic reduction yields to enhanced productivity in Electric Arc Furnace

Challenge

Melting of the steel scrap is carried out with 50-ton Electric Arc Furnace rated at 30 MVA. A steel plant is connected to the public network and is fed from a substation located 7km away making it a weak network. Rapid fluctuations in the demand of reactive power were caused by the dynamic operation of the EAF. Inability of the supply grid to deliver the reactive power demand in an efficient manner were resulting in high voltage fluctuations and flicker. High flicker was also being experienced by the other customers connected to the same busbar. As a result of poor power quality, melting time at the plants were longer and maintenance costs higher.

Solution

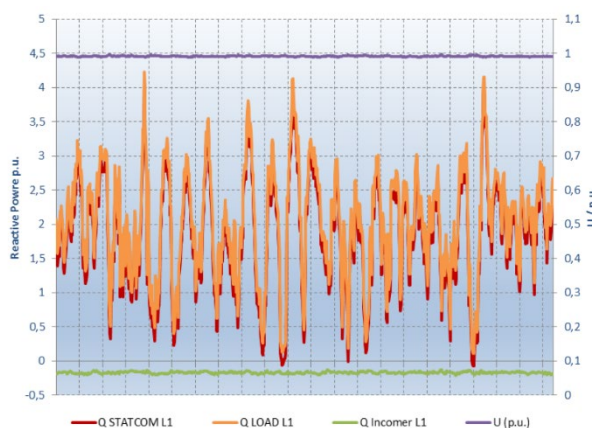
Merus Power delivered a 16 MVar Merus™ STATCOM system as a turnkey project. Merus scope of delivery included Merus™ STATCOM modules, control and protection system, cooling system, filter capacitor bank, filter reactors and complete engineering.

Total compensation of 16 MVar was equally divided between active compensation and fixed compensation. 8 MVar of active compensation was provided by 6 pcs of Merus™ M1000 STATCOM modules whereas the remaining 8 MVar consist of capacitor banks.

Result

Merus™ STATCOM system was connected to the medium voltage 33 kV busbar. As per post commissioning report, Merus™ STATCOM flicker reduction factor was from 4.5pu up to 5.5pu. Real time response of Merus™ STATCOM not only met the dynamic demand created by Electric Arc Furnace operation in efficient way but also reduced the harmonic distortions significantly.

As a result, the melt-time was reduced which resulted increased revenues of the steel plant due to higher productivity. Mitigation of harmonic distortions has extended the lifetime of the entire steel plant. Steel plant has also successfully met the grid codes and other customers on the same bus bar face no negative impact of the steel plant operations.



Application:
Steel industry, Electric Arc Furnace

Power quality issues:

- Rapidly fluctuating reactive power
- High voltage fluctuations
- High flicker

Merus™ Solution:
16 MVar Merus™ STATCOM system



Customer Benefits:

- Grid compliance
- Voltage support
- Improved Power Factor
- Reduced Harmonics
- Longer service life of equipment
- Increased productivity of the steelplant
- Reduced tap to tap times