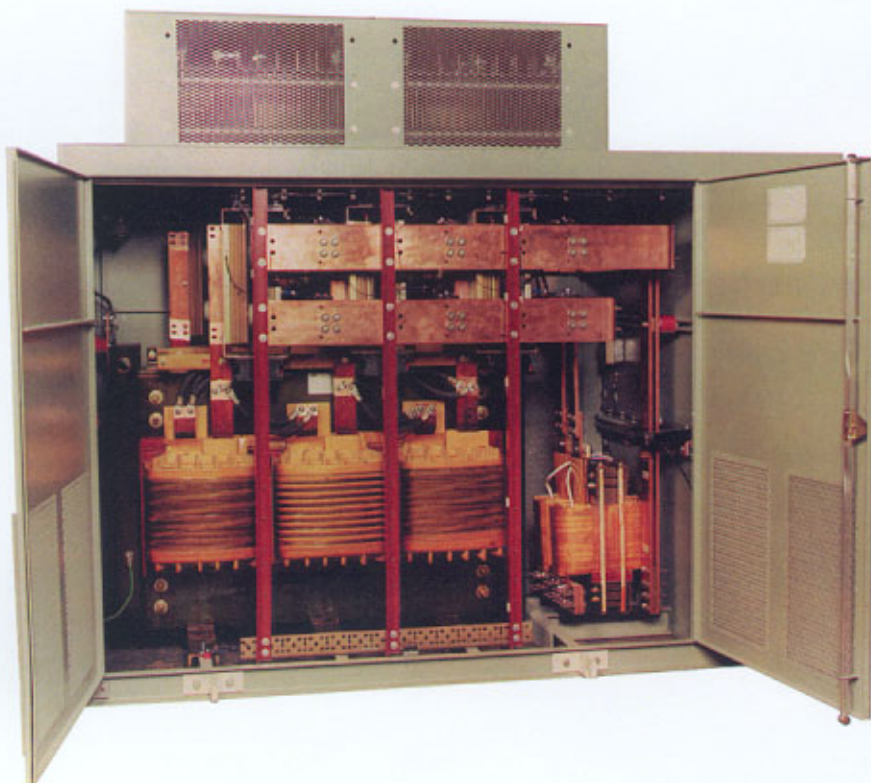


## Spang Power Electronics

# PROJECT PROFILE



### System Operation

This system consists of a 1675 KVA, 3-phase, rectifier-transformer; two 6-pulse, full wave bridges; a control section with switches, visual alarms, and 150 kw regeneration and controls. The transformer isolates the line from the load and steps the 2400 volt input down to 204 volts. A dual wound Delta-Wye secondary splits the output into two, 30° phase shifted voltage sources. A 6-pulse full wave diode bridge, connected to each secondary, rectifies the output into 12-pulse DC. To ensure equal current sharing between the two bridges, the system incorporates an interphase transformer.

### Regeneration Control

This system requires regeneration control. When the crane lowers, the weight of the load can over-rotate the motor and generate excessive voltage back across the rectifier. Without some means of dissipating the excess energy, the rectifier would become

**Spang Power Electronics** designed and manufactured a 1500 kw rectifier for Wheeling-Pittsburgh Steel's Steubenville, Ohio plant. This rectifier can continuously supply 6000 ADC at 250 VDC to the crane in the blast furnace area. To keep energy costs under control, the unit uses a 12-pulse configuration. This configuration improves the power factor and lowers demand charges. It also provides lower harmonic distortion than conventional 6-pulse rectifiers. This is important when the input source supplying the rectifier also supplies other pieces of equipment because the harmonics generated may adversely affect the other loads.

## 1500 KW 12-Pulse Rectifiers for Wheeling-Pittsburgh Steel

overloaded and eventually fail. The regeneration circuit, located on the top of the system, automatically senses a build-up of high DC voltage and connects a resistor bank in parallel with the load to absorb the excess energy. When regeneration ceases, the resistor bank drops out.

### System Protection

The enclosure of this system provides protection from the harsh environment of a steel plant. This includes the ability to operate with the suspended solids and corrosive vapors common to a steel plant with pickling and plating facilities.