CASE STUDY

OPTIMIRA Energy

General Electric Plastics

Ottawa, Illinois

Installation of a One (1) Megawatt Turbine Generator

Problem

The GE Plastics energy productivity manager sent Optimira to the Ottawa plastics plant to review an energy productivity initiative for this plant. During the site visit, the steam generating system steam pressure dropped from 400 psig to 200 psig with the process steam at 150 psig and saturated. Apparently, the feed water pump impellers were replaced with a lower pressure system and its boiler controls were set at 200 psig operating. It was determined that if the boilers returned to the original pressure an initiative could be developed that would meet GE's hurdle rate.

Resolution

Optimira's engineers increased the existing boiler steam to the original operating pressure (400 psig) by increasing the boiler feed water pressure via installation of the original feed water impeller and setting the controls to operate the boiler at 400 psig. It was determined that a turbine generating set installed across a 400/150 psig pressure drop could produce one megawatt of electricity, offsetting the high cost of purchased electricity.

Project Description

The installation of a new 1,000 kW steam turbine induction generation set and a new turbine generator foundation. Additionally, the project encompassed the installation of a 4,160 volt switchgear, a pressure reducing station and controller, with a pressure reducing station in parallel with turbine generator set as well as the upgrade/change impeller on two existing boiler feed water pumps (in 400 psig operation) and the offloading and setting of a turbine generator unit on new foundations. The project involved mechanical and electrical interconnections, site preparation, engineering mechanics, project start-up and project management as well as equipment delivery oversight.

End Result

The project met the GE financial hurdle and the project was implemented.