



MT70L Microturbines

Site

Vestil Manufacturing
Materials handling equipment manufacturer
Angola, Indiana USA

Natural gas CHP installation
Commissioned June 2005

Overview

As a leading manufacturer of materials handling and ergonomic equipment, Vestil Manufacturing Company is focused on providing a diverse, and continually improving, product line to customers in an efficient manner. Vestil has over 250 employees and 500,000 square feet of warehouse and manufacturing space.

Given their desire to improve plant efficiency, reduce emissions, and cut energy costs, Vestil looked to NiSource Energy Technologies (NET) for an integrated energy solution. NET, a subsidiary of NiSource Inc., identifies, develops, and applies technological advances in the distributed energy market.

Challenge

Development of a distributed energy solution requiring an aggressive payback dictates that the system be designed for maximum flexibility and full utilization of the generator's available electrical and thermal energy.

To ensure optimum performance, the system would have to be designed to provide continuous, base load electrical power. Complete utilization of available thermal energy within the plant process would maximize overall efficiency.

The system would have to be designed to avoid any negative impact on Vestil's existing production floor processes.

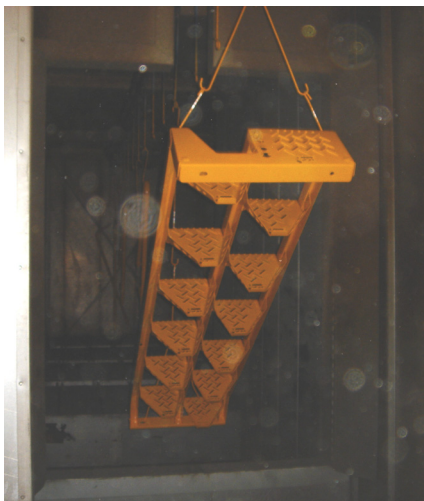
Solution

Upon analysis of the electrical and thermal characteristics of Vestil's plant processes, NET designed a CHP system centered on the installation of two (2) 70 kW Ingersoll-Rand microturbines. The installation provides 140 kW of grid parallel, base load electrical power for the plant, along with 1.10 MMBtu/hr of useful heat to assist in satisfying the thermal energy requirements of the powder coating process.

The 450° F exhaust stream produced by each microturbine is diverted for use at the 350° F powder coat cure oven to supplement the existing source of heat—a 4.50 MMBtu/hr natural gas, direct-fired burner.

For increased system efficiency, the powder coat cure oven's 350° F exhaust stream is likewise diverted for use at the 225° F dry-off oven to supplement its existing 1.70 MMBtu/hr natural gas, direct-fired burner.

In a final effort to further increase system efficiency, the dry-off oven exhaust stream is routed through a fin-tube heat exchanger. This provides heat energy for the five-stage wash process, supplementing its existing 3.50 MMBtu/hr natural gas fired, tube type burner.



Powder Coat Paint Cure Oven

NiSource Energy Technologies was the recipient of a CHP Certificate of Recognition for the Vestil CHP Project, awarded by the US EPA's Combined Heat and Power Partnership in 2005.

Ingersoll-Rand is a proud partner of the EPA's Combined Heat and Power Partnership

Benefits

By installing a solution configured for grid parallel operation, NET and Vestil were able to reduce equipment, installation, and permitting costs. To help offset capital costs, Vestil received approval for a \$30,000 grant from the Indiana Department of Commerce, as part of the state's Distributed Generation Grant Program.

From an energy balance perspective, the CHP system operates transparently within Vestil's existing plant processes. The system is designed so as to avoid any negative impact whatsoever on Vestil's high standards of production and quality.

Specifications

The installation includes two (2) 70 kW Ingersoll-Rand microturbines operating on natural gas, one (1) Beckwith M3410 protective relay, and two (2) 80 kVAR capacitor banks to compensate for the reactive power needs of the induction generator.

The energy audit and engineering were performed by NET. Electrical connections and exhaust ductwork were installed by local contractors selected by NET. Commissioning of the microturbine system was completed by Ingersoll-Rand, with the assistance of NET and Vestil.

A remote monitoring system is used to observe site operation data for maintenance and troubleshooting of the microturbines.



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