

Site

Manchester Tank
Low pressure vessel manufacturer
Elkhart, Indiana USA

Natural gas CHP installation
Commissioned March 2005

Overview

Since 1946 Manchester Tank has been manufacturing low-pressure vessels for propane, air, refrigerant, and industrial applications. An international company, Manchester Tank has five manufacturing facilities in North America. Propane tanks are custom made at the company's Elkhart facility to DOT specifications and range in size from 5-420 psi. These vessels are used in LP gas, recreational vehicle and gas grill applications.

Manchester Tank's state-of-the-art powder coat paint process, credited with improving the durability of the cylinder by 150%, is an integral and critical step in the manufacturing of these tanks.

Having identified an opportunity to use combined heat and power (CHP) to reduce facility energy costs and improve power quality and reliability, Manchester Tank looked to NiSource Energy Technologies (NET) for an integrated energy solution. NET, a subsidiary of NiSource, identifies, develops and applies technological advances in the distributed generation market.

Challenge

When looking for a distributed generation solution requiring an aggressive payback it was essential to match the facility's thermal requirements with the system's exhaust heat output. It was also necessary to size the system to offset base-load power.

Recent power outages resulting in lost production had prompted Manchester Tank to also evaluate installing a backup power source as part of the complete energy solution.

Solution

After analyzing the processes and electrical loads, NET recommended a single 70kW Ingersoll-Rand microturbine for base-load electricity combined with direct use of the exhaust heat to supplement the thermal requirements of the powder coat Cure Oven.

The Cure Oven requires high temperature air, produced by natural gas burners, to properly cure the powder coat paint. At 450°F, the clean exhaust from the microturbine offsets a portion of the natural gas consumed by the gas burners while ensuring maximum use of the thermal energy from the CHP system.

A N130 natural gas industrial standby generator was installed to supply power to critical loads in the event of a power outage. Manchester Tank's computer systems, lighting and annealing furnace control system will all remain operational in the event of a blackout.



MT70 Microturbine



N130 Backup Generator



Powder Coat Paint System

NiSource Energy Technologies was the recipient of a CHP Certificate of Recognition for the Manchester Tank 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

Net Emissions Reduction*	
NO _x	1,012 lbs/yr
SO _x	2,864 lbs/yr
CO ₂	87,198 lbs/yr

*values are representative of this specific installation only. Source: www.epa.gov/cleanenergy/powerprofiler.htm



Microturbine exhaust ducting

For more information about Ingersoll-Rand Microturbines and Industrial Standby Generators, please contact IR Energy Systems or visit www.irenergysystems.com

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Benefits

By installing the microturbine in a grid-parallel configuration, Manchester Tank was able to simplify the utility interconnection, installation and permitting. To help offset capital costs, Manchester Tank applied for and received a \$30,000 distributed generation grant from the State of Indiana's Department of Commerce.

By offsetting electric power and natural gas use at the Cure Oven burner, Manchester Tank's operations will require approximately 21 percent less fuel than with a non-integrated heat and power system. Overall efficiency of the distributed generation system is expected to be 76 percent.

Specifications

The microturbine installation includes an Ingersoll-Rand 70kW microturbine operating on natural gas, an 80kVAR capacitor bank for reactive power compensation and a Beckwith M3410 protective relay. The back pressure is monitored remotely for smooth operations.

A remote microturbine monitoring system is used to observe turbine operation for preventative maintenance and troubleshooting.



800-A Beaty Street • Davidson, North Carolina 28036 USA
Phone Toll Free 877-IRPOWER (477-6937) • International/Direct Phone 704-896-5373
Fax 704-896-4327 • E-mail power@irco.com • Website www.irenergysystems.com

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