

# Innovative use of engine exhaust gases *slashes* *energy costs* at Mannington Mills

Energy costs for a processing plant can bite. For Mannington Mills of Salem, New Jersey, a manufacturer of commercial and residential flooring, a recently completed co-generation plant makes innovative use of the exhaust gases from three natural gas-fired engines to produce steam – a move that reduces energy costs in the company's main plant to nearly nothing.

"We're supplying 80 percent of the electrical demand and 100 percent of the steam demand of our manufacturing plant," says Frank Beaulieu, manager of operations for Mannington. "The cogen plant more than meets our expectations."

Mannington Mills knew from the outset that it required dependable and highly efficient equipment to ensure maximum output. The company turned to Wartsila of Helsinki, Finland, for three turbo-charged 18-cylinder engines. Then it called on Clayton Industries, El Monte, Calif., for two fired steam generators and three heat recovery steam generators.

## Steam heat

The French-made engines are spark-ignited natural gas units that drive ABB electrical generators at 1,200 rpm. Each is rated at 2,800 kw, and has a design exhaust gas flow of 45,000 pph. Among their uses, the pair of fired steam generators provide steam for heating, and

operate as back-up to Clayton's heat recovery steam generators (HRSGs).

The HRSGs are designed to produce 2,700 pph of 85 psig saturated steam. When field tests showed that the units' efficiency was greater and their pressure drop lower than design, there was little doubt that Mannington was on the right track.

## Small footprint

The HRSGs used by Mannington have footprints smaller than their output would suggest. Each is 16-feet-high by 6-feet-diameter, with inlet gas flow at the bottom and a top-mounted exhaust gas stack. And each takes hot exhaust gas from a single Wartsila engine. A catalytic converter controls emissions levels in engine combustion products.

The three HRSGs are supervised by a single control panel, which includes a 15 amp disconnect for power to the circulating pumps and associated controls. The



panel also has a Micrologix 1,500 PLC for system control; a group motor protector and magnetic contractor for each circulating pump; control relays, including a universal alarm; and a water level alarm light.

Since Mannington uses steam for building heat, the HRSGs are able to operate dry in non-heating periods. In October, when heating requirements are minimal, the fired steam generators will be used only when steam requirements exceed the HRSGs' output.

*For more information, contact Clayton Industries at 800-423-4585 or email [clayton@clayton.nl](mailto:clayton@clayton.nl).*