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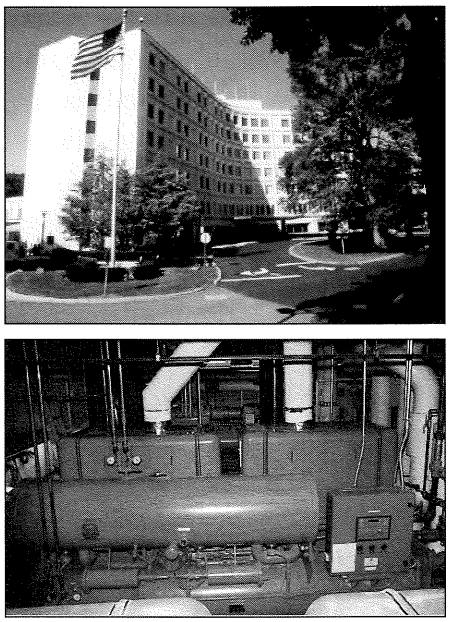
Hospitals Purchase First Four High-Efficiency GED Chillers

Two 400-ton high-efficiency TECOCHILL® DT*x* series water-cooled chillers have operated for longer than a full cooling season (about 3,800 hours) at Northern Westchester Hospital Center in Mount Kisco, N.Y. The 381,000-sq.-ft., seven-story hospital has 235 beds; the chillers, located in a separate building, provide air-conditioning to the entire facility.

The chiller installation, completed by Honeywell in May 1999, has performed well and reduced energy costs in a hybrid system with one McQuay electric chiller. The Tecogen units, which cycle on sequentially as air-conditioning demand increases, carry most of the load, while the electric unit rarely runs.

Tony Renteria, the hospital's director of Facilities Operations & Management, says, "Energy conservation, cost savings, and unit reliability are the most important benefits of the engine-driven chillers." The Tecogen units replaced two absorption chillers powered by steam from gas boilers. The hospital not only replaced its chillers and boilers, but also retrofitted its entire lighting system.

From January to November 1999, compared with the same period of the previous year, the hospital's natural gas bill was reduced by $181,765 and the electric bill dropped by $90,028. Installation of new plumbing fixtures and other equipment has yielded an additional cost savings of $57,048 so far. "We're conserving a lot of energy," says Renteria.



Tecogen's first two high-efficiency TECOCHILL® DTx series water-cooled chillers, installed in a hybrid plant at Northern Westchester Hospital Center, Mount Kisco, N.Y, helped the hospital realize a beneficial cooling season.

A second hospital in Jamaica, N.Y., has also purchased two TECOCHILL® DT*x* units, shipped in January 2000. Tecogen reports that six more orders are pending through mid-2000. Says Jeff Glick, Tecogen regional sales manager, "We expect a steady increase in the number of DT*x* units installed over the next few years."

GRI Research Continues to Yield New Products

Since the mid-1980s, GRI has supported research to develop high-efficiency, cost-effective chillers driven by natural gas-fueled engines. From the beginning, GRI's strategy was to reduce operating costs for commercial gas customers by avoiding high electricity prices during peak demand periods, which coincide with most air-conditioning loads. This successful program has led to the introduction of numerous gas engine-driven chiller products and systems.

GRI has worked with several partners including manufacturers of HVAC equipment, engines and control systems. One of GRI's early partners was Tecogen, which now offers an extensive line of packaged gas engine-driven TECOCHILL® products in sizes from 50 to 1000 tons. The DT Series — water-cooled chillers in the mid-size range (200 to 350 tons) — uses two TecoDrive® 7400 natural gas engines paired with twin-screw compressors.

New Refrigerant, Higher Efficiencies for DT*x* Series

To improve upon the TECOCHILL® DT Series, which uses HFC-22 (R-22) refrigerant, GRI worked with Tecogen to develop and introduce the higher-efficiency DT*x* Series, which relies on the environmentally friendly refrigerant HFC-134a. The new chiller is also quieter as well as easier to operate and control.

The DT*x* Series, available in the 300- to 400-ton range, reaches efficiencies that are 20% higher than the conventional 350-ton unit:

- Full-load coefficient of performance (COP) of 1.57
- Integrated part-load value (IPLV) COP of 2.51
- Full-load COP of 1.89 and IPLV COP of 2.84, with heat recovery from the engine jacket coolant (radiator fluid)
- Full-load COP of 2.1 and IPLV COP of 3.01, with heat recovery from the engine jacket and exhaust gas

The DT*x* Series produces up to 400 tons of chilled water at 44°F. Of this capacity, the system provides 365 tons for continuous, baseload operation, while the other 35 tons are available for peak shaving (up to 100 hr/yr).

"The capabilities of the engine system are well matched with most space conditioning applications," says Glick. Natural gas consumption is about 3 million Btu/hr (1020 Btu/scf).

Design Changes Enhance Performance

In place of the twin-screw compressor, the refrigeration system in the DT*x* Series TECOCHILL® uses a mono-screw design with a geometry that facilitates closer tolerances and minimum bearing loads. The single screw is balanced with two gates, one on each side, that reduce vibration and noise levels. The DT*x* unit's acoustic emissions are just 87 dBa at 3 feet with the enclosure option.

Also, in the unit's proprietary two-pass flooded evaporator design, the refrigerant is on the shell side, outside of the tube. Vigorous boiling of the refrigerant enhances heat transfer, resulting in lower approach temperatures. The system also features a precise digital refrigerant flow control valve and a compressor oil system that prevents oil carryover and facilitates proper oil management. The system uses HFC-compatible polyolester (POE) oil. The DT*x* unit measures 14'3" L x 6'8" W x 7'7" H.

TECOCHILL®

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