### Overview

Geneva General Hospital in Geneva, NY was able to keep up well with its own electrical generation demands until 1996, when a large building addition increased space by 75 percent. Instead of increasing electric-generation, the hospital chose to install a new natural-gas engine-driven rotary chiller. Recovered heat is used for space heating, air conditioning and domestic hot water. The new chiller is acting as a combined heat and power (CHP) system.

### The Application

The building previously used roof-mounted, air-cooled, 200-ton electric chillers; the building had the highest energy cost of any of the buildings of the Finger Lakes Health System. The project goal was to install and demonstrate the efficiency of a CHP system using a 200-ton, natural gas chiller; Tecochill CH-200x supplied by Tecogen. As part of the package Tecogen also supplied the required cooling tower. The justification for the installation was reduced electrical consumption and waste heat recovery from jacket water to the building heating system and domestic hot water production.

### Quick Facts

- **Location:** Geneva, NY
- **Installation Date:** September 2003
- **Operating Experience:** 7 years
- **CHP Equipment:** Tecochill CH-200x supplied by Tecogen
- **Generating Capacity:** 400 kW
- **Heat Recovery Application:** Space heating, air conditioning and domestic hot water
- **Type of Fuel:** Natural Gas
- **Annual Utility Savings:** $45,812
- **Simple Payback:** 7.2 years

*New Marley 300 ton cooling tower*
CHP System and Equipment

The chiller installed is a Tecochill model 200x with catalytic emissions control and heat recovery. The Marley cooling tower supplied by Tecogen is an open tower model #NC3100. The chiller was connected in parallel to the existing air-cooled chiller with 5” piping; chiller water driven by 2 new pumps. The condenser bundle was connected in parallel to the existing air-cooled chiller as well with 6” piping; condenser water driven by 2 new pumps.

Economics and Environmental Benefits

As a result of the new gas-powered chiller, electrical demand was reduced thereby reducing costs. Recovered heat used for domestic hot water (DHW), air conditioning and space heat also reduced costs usually associated with them. A yearly savings of over $45,000 has resulted in a 7-year simple payback on investment. This system is being showcased for other potential users of the technology.

Summary of Benefits

- Reduced costs for energy needs
- Recovered heat used for DHW and other heat requirements
- Short payback period

"CHP offers extraordinary benefits in terms of energy efficiency and emissions reductions by optimizing the use of heat that would otherwise be wasted when generating power”
~ Oak Ridge National Lab

Web Links and Further Information:

Designer
www.nrg-concepts.com

Chiller Manufacturer
http://www.tecogen.com/chiller.htm

Other DG/CHP Resources
chp.nyserda.org
www.northeastchp.org

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