



St. Joseph's Hospital Health Center

4.6 MW CHP System

Quick Facts

LOCATION: Syracuse, NY

MARKET SECTOR: Hospitals

FACILITY PEAK LOAD: 6.1 MW

EQUIPMENT: 4.6 MW Solar Turbine Mercury 50-6000R recuperated gas turbine

FUEL: Natural Gas

USE OF THERMAL ENERGY: Space heating and cooling, domestic hot water, sterilization, humidification

CHP TOTAL EFFICIENCY: 81%

ENVIRONMENTAL BENEFIT: 12,000 ton annual reduction in CO₂ emissions

TOTAL PROJECT COST: \$15 million

PAYBACK: 12 years

CHP IN OPERATION SINCE: 2014

NOTE: Received 2017 Vista Award from the American Society of Healthcare Engineers



Location of CHP plant at St. Joseph's Hospital Health Center, Syracuse, NY

COURTESY OF Cogen Power Technologies

Site Description

St. Joseph's Hospital Health Center is a 451 bed hospital in Syracuse, NY. In 2009, St. Joseph's began a \$220 million expansion, including a new surgical tower, new emergency services building, an emergency psychiatric program, and an energy-efficient data center. Completed in 2015, the expansion meets LEED Gold certification, the second-highest LEED tier. The expansion incorporated maximization of natural light, recycled building materials with low or no volatile organic compounds emissions, a stormwater retention system, and a 50,000 square foot green roof.

Reasons for CHP

St. Joseph's began investigating CHP during the expansion of their facility when they were faced with significant power capacity restraints. They invested in CHP as an environmentally conscious means of supplying their own power and reducing the need for importing electricity from the utility. The CHP plant also creates significant energy cost savings for the hospital.

- Avoiding utility grid constraints
- Reduction of environmental impact
- Resiliency
- Energy cost savings

CHP Equipment & Operation

The CHP system at St. Joseph's Hospital Health Center is a 4.6 MW Solar Turbine Mercury 50-6000R recuperated gas turbine. It has a heat recovery steam generator providing 85 psig saturated steam at 14,000 lb/hr unfired, and 45,000 lb/hr fired. It also has a 225 psig natural gas compressor. In total, the CHP system is designed to meet 75% of the electrical and 100% of the steam and heating needs of the hospital.



Location of a viable site for the CHP plant within the hospital was a challenge. However, the project team was able to locate and utilize space over a loading dock and under an overhang of the existing building. Fitting a 4.6 MW plant over a loading dock serves as a testament to the versatility and compact footprint of a well-designed CHP system.

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In the case of a utility grid outage, the system is equipped with an automatic load shed system to control the electricity supply when islanded and maintain hospital facility operation.

Lessons To Share

More and more frequently, facilities are faced with constraints on expansion due to electric grid infrastructure, and utilities themselves are now looking to alleviate such concerns through distributed generation like CHP. St. Joseph's Hospital demonstrates the benefit of avoiding grid constraints with CHP, saving money for both the end-user and the utility. The CHP system displaced 4 MW of peak demand on National Grid's network.

The CHP system also provides significant environmental benefits, as well as increasing the resiliency of the hospital. The CHP system was an integral part of the hospital expansion achieving LEED Gold status, one of only 28 hospitals in the country to do so at the time of its completion.

"In the past, if we lost power from the grid, we had to stop any surgeries that were underway because the department of health won't let you perform surgeries just on a generator. So they would close up and stop a cardiac or other procedure."

*- Ed Grabowski, Mechanical Engineer
St. Joseph's Hospital Health Center*

For More Information

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More CHP Project Profiles:
www.nynjCHPTAP.org
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