

# Little Company of Mary Hospital 3.8 MW CHP Application



## Fact Sheet

Before the idea of a CHP (Cooling, Heating and Power) plant was introduced at Little Company of Mary Hospital in Evergreen Park, Illinois in 1988, the hospital experienced instantaneous power outages at the rate of two or more every month, nearly 30 per year. These instantaneous outages affected the data processors, lab testing and other critical equipment and procedures. Providing the solution, LaSalle Associates, Inc. of Glen Ellyn, Illinois, was hired to design and install a 3.8 megawatt CHP plant with a Solar Centaur H gas turbine, nearly eliminating the power outages. The hospital experienced \$100,000 electric savings per month and a 2-3 year payback on the successful CHP project.

### QUICK FACTS

|                                     |               |                       |
|-------------------------------------|---------------|-----------------------|
| Annual Instantaneous Power Outages: | 24+           | Reduced to 4 per year |
| Annual Savings:                     | \$250,000     |                       |
| Installed Cost:                     | \$1.2 Million |                       |
| Estimated Payback:                  | 4-5 Years     |                       |
| Actual Payback:                     | 2-3 Years     |                       |
| Generating Capacity:                | 3.8 Megawatts |                       |
| Operation Since:                    | July, 1989    |                       |
| Facility Size:                      | 848,000 sq ft | 306 Beds              |

"Before installation, we were experiencing power interruptions twice a month. The turbine, tied in series to the electric utility, nearly eliminates the instantaneous power outages to the hospital," explains James Joyce, Director of Engineering.

### REASONS FOR CHP

"ENERGY SAVINGS"

&

"POWER RELIABILITY"



The electricity supplied to Little Company of Mary Hospital was of very poor quality, bringing about instantaneous power outages as often as twice a month. These outages forced critical computer and testing equipment to be reset and test procedures to be started over.

Frustrations on behalf of the staff and patients were high. Being on the operating table and having the lights go out and no power for 7 seconds can be quite scary. The economics of a \$1.2 million CHP plant proved to be a feasible solution to bring in reliable power with an actual payback of 2-3 years. A grant helped supplement the installed first cost of the CHP plant.

# CHP Application

## SYSTEM EQUIPMENT

- One 3.8 MW Solar Centaur H gas turbine with high pressure heat recovery
- Cleaver Brooks heat recovery steam boiler: 23,000 lb/hr steam @ 105 psi
- One 550-ton Carrier absorption chiller
- One 135-ton Carrier single-effect absorption chiller
- Two 375-ton electric centrifugal chillers
- Two 250-ton electric centrifugal chillers

## CHP OPERATION

The CHP plant operates on a 24 hour, 7 day a week schedule. As a general rule, turbines are not constructed to operate through frequent shut downs and start-ups. The hospital CHP plant covers the following loads:

- Summer
  - 23,000 lb/hr Maximum Steam
  - 3,000 kW Electric Demand
- Winter
  - 25,000 lb/hr Maximum Steam
  - 2,400 kW Electric Demand



## WASTE HEAT RECOVERY

No supplemental firing of boilers is necessary at Little Company of Mary Hospital. The waste heat recovered off of the turbine has been sufficient to cover the entire steam load of the hospital. Uses of the high-pressure steam recovered heat from the turbine:

- Space Heating
- Absorption Cooling
- Sterilization

## ADDITIONAL FACTS

- An added incentive to the CHP plant project, NICOR Gas supplied and installed the 150 pound high-pressure natural gas main line down 95<sup>th</sup> Street to the hospital.
- No supplemental firing is needed by the boilers to help cover the steam load. Existing boilers remain on standby.
- EPA reports hospital's NOx emissions are lower
- Maximum annual energy savings reached \$850,000 with low gas prices
- The CHP plant is tied in series to the electric utility; if a voltage fluctuation occurs from the turbine-generator, the utility tied in series backs up the engine generators nearly eliminating instantaneous power outages to the facility. The hospital incurs nearly four interruptions per year from the generator but never affecting the hospital.
- LaSalle Associates, Inc. provided the feasibility study, design and installation of CHP plant.

### For further information contact

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[www.CHPCenterMW.org](http://www.CHPCenterMW.org)

Estimated  
4-5 year  
payback;  
actual  
payback  
experi-  
enced in  
2-3 years

\$850,000  
maximum  
annual  
energy  
savings

Nearly  
eliminated  
the 24+  
yearly  
instanta-  
neous  
power  
outages to  
the hospital

