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Beloit Memorial Hospital

Ballard Engineering recently completed the design and construction of a 3,000 KW distributed power/cogeneration system at Beloit Memorial Hospital in Beloit, WI. The system provides maximum flexibility to both the hospital and local utility company (Alliant Energy) in regards to electricity, heating, air conditioning, and hot water usage.

The scope of the work revolved around ten major features:

1) Remove and replace old emergency generators.
2) Provide approximately 1,500 KW power for the entire hospital.
3) Export approximately 1,500 KW power to the local utility company.
4) Provide heat to drive a 400-ton absorption chiller or the facility's existing heating loop.
5) Provide heat for domestic hot water usage.
6) Make it possible for the system to operate on natural gas or diesel gas in the event of an emergency.
7) Provide instantaneous power in the event of a utility failure.
8) Provide the utility company with an "on-call" system to reduce utility load or grid short falls.
9) Maintain the entire cogeneration system at 69.8% efficiency.
10) Remove and replace older 12KV cables which were located internally to the hospital.

In order to provide all these services to the customer, it was determined that seven (7) major components would need to be put in place. First, a 3,250 sq. ft. two level sub-grade matching style building addition to the north end of the existing hospital would have to be constructed to house the engine room and the control room. Two (2) Fairbanks Morse dual fuel 900 RPM 1,500 KW engine generator sets were purchased along with (2) 3,000 AMP 480V and a 6,000 AMP 480V automatic breakers. A 12KV automatic main service breaker was utilized for connection to the local utility. A 400-ton Carrier absorption chiller was also used. Plate and frame heat exchangers and finned tube type heat recovery units captured heat for domestic hot water, heating and steam. Two (2) outdoor excess heat rejection radiators (1 Jacket Water and 1 Aux Water) were installed and located in an enclosed 1,600 sq. ft. courtyard directly west of the new building addition. Finally, a networked graphic system was installed which routed all the major equipment's readings to a central computer terminal located in the control room for monitoring and record keeping.

See attached article that was published in DISTRIBUTED POWER magazine (November/ December 2000 issue) which is a supplement to DIESEL & GAS TURBINE WORLDWIDE.