

Backup Power's Miracle Cure

In today's digital age, hospitals have grown increasingly more dependant upon electricity. When disaster strikes and the lights go out, hospital operations cease. To ensure continued care in a disaster, the Joint Commission on Accreditation of Health Care Organizations recently codified a backup power timeline within the emergency operations plan requirements for hospitals. In an emergency, hospitals must keep utilities running, among other operations, for 96 hours.

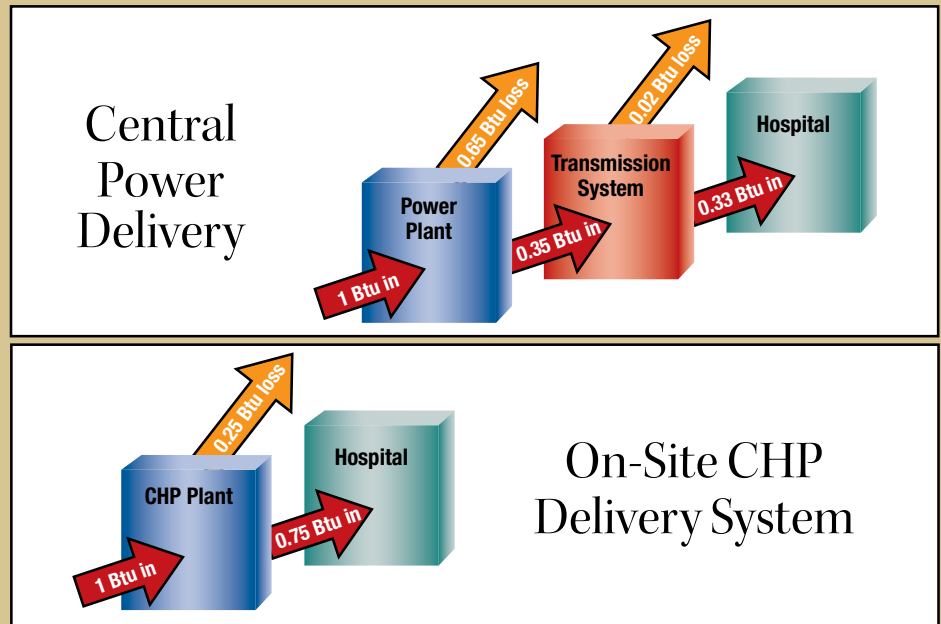
All hospitals are required to have a diesel generator as backup, but these have proven to be unreliable. While emergency backup power turns on within the National Electric Code-required 10 seconds, during the recent Northeast blackout, 67 percent of backup power failed because these systems weren't designed to run continuously. With a 33 percent chance of success, diesel backup generators simply aren't enough in life-or-death situations.

Efficient, Reliable and Sustainable Power

Energy is a hospital's second largest expense — second only to staff compensation — so increasing energy efficiency and decreasing energy use with a more reliable power source cuts a hospital's operating costs significantly.

Dell Children's Medical Center of Central Texas, the first LEED® Platinum hospital worldwide, and the new Shands Cancer Center at the University of Florida turned to Burns & McDonnell to find more efficient and reliable energy. For both hospitals, Burns & McDonnell designed an on-site combined heat and power (CHP) plant and assisted in developing financial and economic cost models, which included each hospital partnering with its local utility — Austin Energy and Gainesville Regional Utilities, respectively.

"Especially for public, nonprofit hospitals, partnering with a local utility creates a win-win situation for both parties," says Ed Mardiat, principal and director of CHP development for



In a central power delivery system, only a third of every BTU consumed is converted into electrical energy, with the rest going up the stack or cooling tower. An on-site combined heat and power (CHP) energy delivery system converts three-fourths of every BTU consumed into useful electric and thermal energy for the hospital.

Burns & McDonnell. "Through a cost-sharing arrangement, the utility acquires another power plant, which alleviates grid congestion and offsets ever-increasing demand. The hospital benefits through the cost savings of energy efficiency, more reliable and increased backup power, cleaner normal power and islanding."

While a facility with on-site CHP is still connected in parallel with the electric grid, it doesn't have to rely upon the grid for power. For instance, in Gainesville, Fla., if there's a hurricane, Gainesville Regional Utilities will disconnect, or island, the energy center from the grid before the hurricane hits to ensure reliable power continues to serve Shands Cancer Center without disruption. With on-site CHP, power at Shands Cancer Center won't be disrupted or transferred onto the emergency diesel generator when the surrounding area loses power. (*See page 15 for benefits of CHP at Shands Cancer Center.*)

For facilities seeking LEED® certification, the sustainable features of CHP can make the difference between gold and platinum, as it did for Dell Children's Medical Center — a distinction that improves the hospital's public image, resulting in positive press coverage, neighborhood support and a philanthropic edge.

The Future of CHP

The U.S. Department of Energy (DOE) considers CHP to be "one of the most promising options in the U.S. energy efficiency portfolio" because of its low greenhouse gas emissions, high energy efficiency, potential for nationwide implementation and ability to relieve the burden of increasing demand on the electric grid. As a result, the DOE is encouraging the nation to augment CHP generation to reach 20 percent, or 240,900 megawatts, of U.S. power generation capacity by 2030, according to "Combined Heat and Power: Effective Energy Solutions for a Sustainable Future," a 2008 DOE report. Achieving this goal can:

- Save 5.3 quadrillion Btu annually, almost half of total consumption by U.S. households
- Reduce CO₂ emissions by 848 million metric tons annually, the equivalent of removing 154 million cars from U.S. roadways and avoiding 60 percent of projected CO₂ emission increases
- Create 1 million new jobs
- Spark \$234 billion in new investments

"It's not just hospitals that can benefit from on-site CHP generation," says Mardiat. "Any facility with a critical mission such as a data center, defense facility, or an airport could prosper with on-site CHP."

For more information, contact Ed Mardiat, 816-822-3344.