Press Release

Contact:

Gary Mason Tognum America Inc.
Phone: +1 248 560 8480
E-mail: gary.mason@tognum.com

Agency contact:
Robert E. Sheldon, APR Creative Communications Consultants, Inc.
Phone: +1 210 828 1880
E-mail: rsheldon@cccinc.com

Georgia hospital gains operational flexibility, fuel efficiency and future growth capacity with new standby power system

Generator sets from MTU Onsite Energy provide 10 MW of emergency standby power for The Medical Center of Columbus Regional Healthcare System.

COLUMBUS, Ga., October 24, 2012 — Recognized as the region's leading healthcare provider, The Medical Center of Columbus Regional Healthcare System is a 400-bed hospital that offers a comprehensive menu of medical services. Like all healthcare facilities, The Medical Center relies on emergency standby generators to ensure uninterrupted electrical power during utility outages. However, like many established healthcare facilities, the hospital's backup system was an aging collection of standby generators that had been added over the years as the hospital grew. The generators were still adequate to power critical loads during utility outages, but they lacked the capacity to handle the hospital's total electrical load, including HVAC.

Rather than add to its mix of existing standby generators—some that were over 30 years old—The Medical Center decided to replace all of them with a new central power plant equipped with four new 2,500 kW generator sets from MTU Onsite Energy. Not only does the new central plant provide emergency standby power for all of the hospital's current needs, it also gives hospital personnel new flexibility in managing the power supply and utility costs, while ensuring enough backup power to accommodate future growth.

Over the years, utility outages at The Medical Center have ranged from a few seconds to several hours, according to Mark Smith, the hospital's director of facilities management. When utility power is lost, patients' lives literally depend on backup power systems to keep electricity flowing to operating rooms, nurseries and life-sustaining medical devices. Backup systems also power emergency egress-lighting and fire-protection equipment, Smith noted.

Plant features four new generators

The new central plant, located across the street from the main hospital in a free-standing building, houses four new 2,500 kW generator sets from MTU Onsite Energy. With a total capacity of 10 MW, the four units could power almost 1,000 homes with 200 amp service panels, according to Smith. The generator sets' MTU 20V Series 4000 engines feature greater cylinder displacement than comparable generator-drive engines, giving them greater reserve horsepower for better load acceptance, as well as precise voltage and frequency control. Voltage and frequency control are important in healthcare applications because medical imaging and other equipment are especially sensitive to power quality.

Like many mission-critical facilities, the hospital has provided for several layers of protection against power outages. To ensure redundancy, utility feeds from two separate substations supply power to the main switchboard. If power from one utility feed fails, the other utility feed automatically supplies the power. The standby generators get a signal to start if one of the utility feeds fails; however, if the second utility source remains stable, the generators shut down and return to a standby state. A generator equipment failure won't cause problems for what Smith described as a "totally redundant" system. "If any piece of equipment in this plant fails, there's a backup piece of equipment that will do its job," he said. "So you'd actually have to have multiple failures before the plant wouldn't operate."

The MTU Onsite Energy generator sets generate power at 12,470 volts, which is fairly unique for standby power systems. However, the ability of the generators to operate at this high voltage enables them to match the incoming utility voltage and avoid energy-wasting transformers between the utility and the central plant. Also, by generating at this high voltage, electricity travels more efficiently through the underground cables connecting the central plant to the hospital across the street. Even the layout of the new central plant contributes to the system's efficiency. For example, the design engineer arranged the four generator sets so that the exhaust vents from the engines and the cooling air intake vents for the radiators were located on the same side of the building. This design makes sure that the exhaust gases do not reenter the building, and it allows all of the switchgear to be grouped together along the other side of the building, resulting in more efficient use of space and easier maintenance access.

Control equipment for the standby power system is located in both the central plant and a power center inside the hospital. Facility management personnel can take full control of the generator plant from the power center, which includes a 52-inch digital display that projects a one-line diagram of the plant. Four 400-gallon day tanks housed in the plant building supply fuel for the generators. A 20,000-gallon tank on the hospital side of the street resupplies the four day tanks. Although the hospital plans to add additional fuel storage capacity, the new generators actually use 30 percent less fuel than the old units for a given load, according to Smith.

Since completion of the installation, the generator sets have performed exactly as designed during several power outages. The units also run more quietly than their predecessors, thanks to critical-grade mufflers installed on each unit. "There's an HVAC cooling tower nearby, and you can hear the water running in the cooling tower over the noise made by all four generators," said Eddie Oliver,

a sales engineer for W.W. Williams, the local MTU Onsite Energy distributor that provided the units to The Medical Center.

Flexibility gives hospital new options

The central energy plant has many advantages over the former collection of standby generators. For example, the new plant has the capacity to power all electrical loads in the hospital, not just critical life-safety systems, said Smith. Among other advantages, this gives the hospital greater flexibility in managing power use and cost. At any given time, the facility can be totally on the power grid, partially on the grid, or totally off the grid, depending on the situation.

During routine testing, hospital personnel can start the generators and briefly operate them in parallel with the utility while the facility transitions from full utility power to full generator power. Without this paralleling feature, power breaks could cause lights to flicker and/or disrupt the operation of critical medical equipment.

Similarly, during the approach of a severe storm, the hospital can preemptively run its generators in parallel with the utility until the storm passes. “All you do is burn a few gallons of fuel,” said Smith, “so there’s little cost involved. But the payback could be tremendous. If we did it 10 times and lost power just once, it would be well worth it.”

The Medical Center’s new central power plant can also be put to use during extremely hot summer days, when power demand soars and utility rates jump. At such times, the backup generators can take some load off the grid and potentially reduce electrical costs, depending on the price of diesel fuel and the price the utility is charging for electricity at any given time. To determine whether dropping off the grid makes financial sense for the hospital, Smith plugs the spot price of

diesel fuel into a formula for calculating the price at which the hospital can generate its own electricity. Then he compares that price to the price being charged by the utility at that particular time.

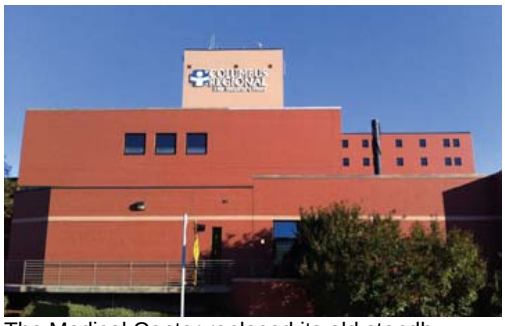
If the utility's price for electricity is higher than the cost to generate power onsite, Smith flips the switch on the new power plant. As a result, during some recent hot periods, the hospital saved approximately $5,000 per day in power costs, according to Smith. Even though the U.S. Environmental Protection Agency limits the number of hours per year the hospital can run its generators for load management, Smith said, "We don't come anywhere close to the limit."

Extra generating capacity has its advantages

One of the plant's most impressive features is its 10 MW generating capacity. At present, The Medical Center runs on about 4 MW of power. "So even if two of the plant's 2.5 MW generators failed, we could still run on the other two and not have any issues," Smith said.

According to Oliver, The Medical Center originally planned to purchase just three generators and leave room in the plant for a fourth. Instead, "they bought for the future" by purchasing four units. This means, he said, that the hospital's power needs could grow by 80 percent and still leave one redundant generator for more convenient maintenance and reliability purposes.

Soon, The Medical Center will call on its central energy plant to provide backup power for a sister hospital across the street that was acquired several years ago. And more growth is undoubtedly ahead for the region's main healthcare facility. But with a quartet of powerful new generators at his disposal, Smith is confident about meeting any challenges that arise: "This emergency power plant will serve our needs today and carry us into the future for years to come."



The Medical Center replaced its old standby power system and gained operational flexibility, fuel efficiency and future growth capacity.

Four 2,500 kW MTU Onsite Energy generator sets provide standby power and load management functions for The Medical Center.

A new central power building houses the four MTU Onsite Energy generator sets and paralleling switchgear.

The paralleling switchgear facilitates routine power system testing and energy management during summer's peak periods.

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About MTU Onsite Energy

MTU Onsite Energy is a leading producer of diesel-powered generator sets from 30 to 3,250 kW and natural gas-powered generator sets from 30 to 400 kW for standby, prime power and cogeneration applications. The company also provides automatic transfer switches, paralleling switchgear, controls and accessories for complete power system solutions. MTU Onsite Energy is a subsidiary of Tognum America Inc., part of the Germany-based Tognum Group.

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About Tognum America

Tognum America (formerly MTU Detroit Diesel) is a Tognum Group company and is responsible for the manufacture, sales and support of MTU and MTU Onsite Energy branded products in North and Latin America.

Tognum

With its two business units, Engines and Onsite Energy, the Tognum Group is one of the world's leading suppliers of engines and propulsion systems for off-highway applications and of distributed power generation systems. These products are based on diesel engines with up to 9,100 kilowatts (kW) power output, gas engines up to 2,150 kW and gas turbines up to 45,000 kW.

The product portfolio of the Engines business unit comprises MTU engines and propulsion systems for ships, for heavy land, rail and defense vehicles and for the oil and gas industry. The Onsite Energy business unit supplies distributed power generation systems carrying the MTU Onsite Energy brand. These comprise diesel engines for emergency power, prime power and continuous power, as well as cogeneration power plants based on gas engines and gas turbines that generate both power and heat. Tognum's product portfolio also features fuel-injection systems built by L'Orange.

In 2011, Tognum generated revenue of around €2.97 billion and employs more than 10,000 people. Tognum has a global manufacturing, distribution and service structure with 24 fully consolidated companies, more than 140 sales partners and over 500 authorized dealerships at approximately 1,200 locations. Since September 2011, Engine Holding GmbH, a joint venture between Daimler AG and Rolls-Royce Group plc, has a majority holding in Tognum.AG and Rolls-Royce Group plc, has a majority holding in Tognum.

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