

T-REX

BIG CAT® C175-16 GENSETS ANCHOR HOSPITAL POWER PLANT

When UNC Rex Healthcare elected to build a new central energy plant, it meant relocating standby power generation equipment from the basement of the hospital in Raleigh, N.C. to a new standalone central energy plant in the rear of the campus.

In conjunction with the move, Rex purchased two Cat® C175-16 generator sets to go with the existing Cat 3516 genset that was relocated from the basement.

Another Cat C175-20 was added when additional capacity was required as part of the hospital’s Heart and Vascular campus expansion.

“We have a long, ongoing partner relationship with our Cat dealer,



Gregory Poole,” says Rex facility director Jeff Carter. “We’ve had a very good relationship with them for many years, and it was pretty much decided that we were going to use Cat generators at the beginning of this project.”

The 17,000-square-foot, two-story energy plant opened in 2012, and houses four Cat diesel generator sets that are capable of powering the entire campus in the event of a blackout. The power plant can generate 12.25 MW of power—more than enough to cover the entire electrical load of the Rex campus.

“This facility is very well designed,” says plant manager Michael Brailsford. “I couldn’t be happier the way the control room is positioned in a central location. I can operate and monitor the generators from the control room. I can watch our boilers and eventually the chiller plant is going to be located in the back. And with our SCADA and building automation systems, we have total control and view over everything from our control room.”

Rex Hospital provides a full range of medical services to nearly 500 patients on a daily basis. The facility includes 24 operating rooms along with procedure rooms, patient care support, intensive care and an emergency ward.

“If we lose our main utility power source, these generators will automatically kick on within 10 seconds or less and provide full power to the hospital,” Carter says.

Rex does not hesitate to switch over to its own utility power when a storm threatens. The hospital exercises the

CUSTOMER PROFILE

UNC Rex Healthcare

Location: Raleigh, N.C.

Application: Standby power

Cat® Equipment:

Main Hospital: C175-16 (2), C175-20, 3516; Other Locations: 3208, 3406, 3412, C18, G25



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MICHAEL BRAILSFORD
Plant Manager
UNC Rex Healthcare



practice known as storm running as many as eight to 10 times a year.

“An office building or other businesses can ride through a storm having their power blink on and off a little bit, but we can’t because we’re a hospital,” Brailsford says. “We have doctors who are operating and other procedures going on, such as people



UNC REX

UNC Rex Healthcare is a 439-bed general hospital located in Raleigh, N.C. The capital city’s oldest hospital was founded in 1894 through a bequest from John T. Rex, a tanner and local philanthropist.

UNC Rex Healthcare is a member of the UNC Health Care system, a non-profit integrated health care system owned by the state of North Carolina.

UNC Rex Healthcare was the first hospital in the Research Triangle, and one of only 10 in North Carolina to receive Magnet Recognition, which places Rex nurses among the top two percent in the country. Last year, UNC Rex Healthcare received a top five-star rating from the Centers for Medicare & Medicaid Services, placing it among the top 9.1 percent of hospitals nationwide. CMS analyzes hospitals using data on outcomes, patient experience and other factors.

In 2014, UNC Rex Healthcare was recognized as the hospital with the best patient interactions in the state of North Carolina.

who are on life support, so we must maintain as smooth a flow of power from the grid as possible. We won’t put up with too many of those events before we decide to separate from the utility.”

Rex also has an agreement with Duke Energy where it will curtail its energy consumption from the grid and self-generate 75 percent of the hospital’s load when called upon by the utility—usually during periods of extreme ambient cold or heat, which creates a higher demand for grid power.

Bigger power, smaller footprint

The high power density of the 4 MW C175-20 generator set provides more power from a smaller footprint. The increased power density is a key benefit for standby power used in large, mission-critical installations, such as data centers and hospitals. The larger

single unit enables hospitals to carry larger life-safety loads.

The generator sets are tested weekly by Rex facilities staff to ensure they are in proper working order. Brailsford alternates between paralleling the generators with the utility and isolating from it. One week he will perform a base load test where 30 percent of the capacity of each of the generators is utilized, running three at a time. The following week, he isolates from the grid and runs the generators for an hour at full load.

Rex staff also performs routine maintenance. But all regularly scheduled maintenance is performed by Gregory Poole Power Systems as part of a Customer Support Agreement with the hospital.

“We have operators who have basic knowledge of the maintenance that



needs to be done on the generators,” Carter says. “Gregory Poole has highly skilled service technicians who can come in and work on these engines at any time. They pretty much know them inside and out.”

Adds Brailsford: “These generators are very complex pieces of equipment, and Gregory Poole provides the expertise required to keep them running at peak performance. As a backup resource, they’re able to work directly with the factory at Caterpillar.”

Brailsford has worked at Rex Hospital for 20 years, and has come to appreciate the dependability of the Cat generator sets.

“They’re great machines,” he says. “They start fast and they’re reliable. They’re doing the job that we need them to do, and I sleep well at night, knowing that we have good machines here.”



CAT® BULK FUEL FILTRATION

UNC Rex Healthcare has two 40,000-gallon fuel tanks stationed in a parking lot adjacent to its central energy plant. The diesel fuel is tested twice a year for impurities.

But even with those measures, minute amounts of water and debris were entering the energy plant’s fuel storage system, which can ultimately interfere with the fuel pumps on the hospital’s Cat® generator sets.

When the problem was identified as contaminated fuel, technicians from Gregory Poole Power Systems removed the old filtration system and installed a Cat Bulk Fuel Filtration System.

“We installed a Cat filtration system last year, and ever since then, all the fuel has been crystal clear,” says Tom Hansen, a product support sales representative for Gregory Poole. “There is no debris coming through it, and no water. Everything has been testing perfectly.”

Clean, dry fuel is absolutely essential in order to achieve long injector life.

A good portion of water and dirt can be removed from the supply fuel by using proper storage tank settling and draining practices. Most of the remaining water and dirt can be removed by using bulk filtration or adding filtration and water separation capacity to each generator set.

The most cost-effective and efficient method to ensure clean, dry fuel is delivered to genset fuel tanks is to use bulk-filter coalescer systems. Filter-coalescer filtration systems have been the standard method to clean large volumes of fuel in the airline and petroleum industries for more than 40 years.

These filtration units are designed to remove solid particles and water from the fuel with single-pass filtration. The units are placed in the fuel supply line between the fuel



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storage tank and fueling station. The units are designed to meet the maximum flow requirements of the fuel delivery system.

Bulk Fuel Filtration applications

The Cat Bulk Fuel Filtration System is intended for use in any application where users store fuel for machines or engines. The filter-coalescer units are placed in a series between the fuel pump on the fuel storage tank and the fuel station. Smaller units are intended for remote day tanks or fuel truck applications.

The system does not require electrical power, unless it is used in extremely cold climates. An optional electric fuel heater is available for colder climates.