

POWER PROFILE

Customer: Fairbanks Memorial Hospital/Denali Center, operated by Banner Health

Location:

Fairbanks, Alaska, USA

Customer Business Issue:

Additional critical life safety, standby and emergency power for 152-bed community hospital

Solution:

Equipment:

Two Cat® 3512 MUI (mechanical unit injected) diesel standby generator sets, each rated at 1,500 kW standby; Cat switchgear

Services:

Generator set service and maintenance as required

Cat® Dealer:

NC Power Systems Co.
Anchorage, Alaska, USA



One of two Cat® 3512B 1500 kW standby generators.

POWER NEED

The 152-bed Fairbanks Memorial Hospital, a part of Banner Health, was growing rapidly. In 2004, this community-owned hospital, nationally recognized as one of the finest hospitals in the United States in cities of similar size, embarked on a \$120 million program to build a new outpatient imaging center, expand its emergency room, and improve other infrastructure.

The work included \$36 million to expand and upgrade the hospital's electrical and trash systems, boilers, and laundry services. Part of that project called for an additional 3 MW of standby electric power, bringing the total to 4.25 MW. "We needed more standby power to support the expanded facilities and prepare for growth in the future," recalls David Thompson, the hospital's maintenance and operations supervisor.

SOLUTION

The local Cat dealer, NC Power Systems Co. in Anchorage, Alaska, worked with designers PDC Consulting Engineers of Fairbanks and contractor Fullford Electric, Inc., of Fairbanks, to deliver the 3 MW standby power system in a competitively bid contract.

At the heart of the system are two Cat 3512 MUI diesel-fueled generator sets, each rated at 1.5 MW standby. Control and distribution is provided by Cat digital switchgear with user-friendly touchscreen interface. NC Power Systems built custom features into the switchgear to suit hospital operators' preferences and added special oil pressure and temperature monitoring to the generator sets according to the designers' specifications.

The new generator sets and switchgear are housed in an extension of the hospital building near the boiler room. They parallel and load-share with an existing 1.0 MW standby generator set. The new installation is fully integrated with the existing standby generator

set. Although the system is configured to operate in parallel with the local electric utility (Golden Valley Electric Association) and export to the grid, Fairbanks Memorial is not using that capability at present.

RESULTS

The two Cat generator sets, commissioned in June 2007, constitute the hospital's primary standby power supply. Together their capacity nearly doubles the hospital's current peak loads of 1.7 to 1.8 MW. "I could operate the entire hospital on the standby power system and no one would know the difference," Thompson says. "I also have spare capacity to support future growth."

The hospital has two utility feeders, each serving about half the facilities. The generator sets are kept online in an auto mode. If the hospital loses a utility feed, a signal is sent to the generators, which start within nine seconds. The generators synchronize and breakers close automatically to begin delivering power to critical loads, including surgery suites, life safety systems, boilers, and essential lighting. Hospital engineering staff then must decide whether to switch the entire hospital over to the remaining utility feed or use the standby generators to restore the facility to full power.

When the utility feeder is restored, closed-transition transfer switches automatically and seamlessly shift the hospital back to utility power. "No one in the hospital would even notice," Thompson says.

The system received a critical test in September 2007 when Fairbanks Memorial shut down its uninterruptible power supply (UPS) for an upgrade. During the project, the standby generator sets functioned as the UPS. Thompson and his team operated the two units alternately for nearly 200 consecutive hours at 500 to 600 kW output on a load bank. If the hospital had experienced a power upset during

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that time, hospital computers and other critical equipment would have kept functioning as if nothing had happened.

Thompson and his staff find the system easy to operate. The switchgear's touchscreen interface includes an overview screen that clearly shows the system status at any time. Hospital technicians handle routine maintenance and monthly exercising of the generator sets, and NC Power Systems stands ready to provide other service and repairs as needed.

In the future, the system's ability to parallel with the utility could enable Fairbanks Memorial to receive special rate incentives in return for running the generator sets during winter peak-demand periods on the Golden Valley Electric grid – a concept known as peak sharing. For now, however, Thompson is content to have the generator sets on hand to see the hospital through emergencies. "We have a lot of confidence in the system," says Thompson. "It's a sweet system," he says.

For more information, please visit cat.com/powergeneration



Automatic Paralleling/Loadsharing Switchgear