Market Segment: Data Center

POWER PROFILE

Customer: Scott Technology Center

Location:
Omaha, Nebraska, USA

Customer Business Issue:
Standby power for world-class data center

Solution:
- Four Cat® 3516 diesel generator sets
- Cat paralleling switchgear
- Delivery, set-up, installation, operation and maintenance

Cat® Dealer:
NMC Power Systems

Located in Omaha, Nebraska, the Scott Technology Center expanded its data center facility by 30,000 square feet to provide primary storage space, disaster recovery and a backup location for more than 50 companies worldwide.

POWER NEED

In 2001, the Scott Technology Center partnered with the Peter Kiewit Institute in Omaha, Nebraska to provide a business space for information technology, engineering, and research and development. Scott Data Center, a 50,000-square-foot facility, was developed in 2006 to support the growing business incubator.

Originally, the U.S. Department of Defense (DOD) was the sole tenant of Scott Data Center, so the building was designed with high-level security in mind. Built to resist 250 mph winds, floods, tornados and earthquakes, the cast-in-place concrete structure minimizes risk from natural forces. Additionally, Scott Data Center was designed to hold up against outside threats. A K12 barrier wall surrounding the facility can withstand the impact of a 15,000-pound vehicle traveling at 50 mph, and all of the exterior windows have bullet-resistant glazing.

"We are very much a purpose-built facility," said Scott Pollard, vice president of operations for Scott Data Center. "We were designed from the ground up to store and contain sensitive information in a very robust structure that can survive any type of natural disaster."

After the DOD left the facility in 2010, a new strategic vision was developed for Scott Data Center where managers work toward independent, third-party validation of the facility's infrastructure and reliability.

"Many companies are opening existing facilities and using ratings that say they are 99.999 percent reliable, but savvy customers started investigating how those claims can be justified," Pollard said. "As we were designing Scott Data Center, we determined that we wanted an independent group to certify the building for design and construction."

After going through multiple rounds of inspections, the facility was certified by the Uptime Institute as a level Tier 3 data center—one of just five multi-tenant data centers in the nation to earn that distinction. Tier 3 certification means the data center can run constantly without downtime for maintenance or system upgrades.

Today, the facility serves as a primary data center for more than 50 companies, including multiple Fortune 500 corporations, such as Major League Baseball and the Interpublic Group, which is a global advertising holding company. Scott Data Center also serves as a backup location and disaster recovery operation for other companies when the primary system is knocked offline.

"Things that are taking place in this facility are literally supporting tens of thousands of people worldwide at any given moment," Pollard added. "That has a monetary value for our clients. They choose our data center because they're conducting operations that they can't afford to have stop."

Given that the facility is designed to run constantly, the data center required a robust standby electric power system in the event of a power failure from its main utility, Omaha Public Power.

SOLUTION

In late 2011, Scott Data Center expanded with an additional 30,000-square-foot power plant. Facility managers worked with local Cat dealer, NMC Power Systems, to install four new Cat 3516 diesel generator sets for 20 MW of power that is controlled by a customized switchgear system.

Each generator set is housed in its own concrete room and protected by the facility's storm-proof shell. In the rare instance of a generator being unavailable, the system is designed with an N+1 configuration, which means the failure of any one unit will not impact the facility.

"We have run our generators twice during the past year," Pollard said. "In both cases, it was an instance where the Cat switchgear detected a voltage sag, so the facility transitioned off utility power to its own internal generation. We waited about 20 minutes, then transitioned back to utility power."

The data center's switchgear is completely automated, and has the ability to move to another redundant processing point within the gear itself, if needed. As long as another

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generator set is available, the Cat paralleling switchgear will automatically connect to it.

"Caterpillar custom designed everything for us," said Pollard. "We went to Atlanta and participated in witness testing to make sure everything worked before it was disassembled and shipped to Omaha. Since its installion in 2012, we have had zero problems—it has worked flawlessly."

Additionally, under the Uptime Institute's concept of concurrent maintainability—where all equipment must have the ability to be serviced while on generator power without disrupting its critical load—the 3500 diesel generator sets are capable of providing power to the facility for an unlimited number of hours if needed.

RESULTS

Since opening in 2006, Scott Data Center has not dropped a single customer load. Technicians from NMC Power Systems are responsible for all maintenance of the generator sets and switchgear, performing quarterly maintenance on the generators. Live load testing of the generator sets takes place every three months to make sure that everything is functioning properly. NMC also conducts periodic analysis of the diesel fuel stored onsite in two 12,000-gallon tanks.

"We need to have reliable service, whether it be 2 a.m. on a Saturday or routine maintenance during the day," said Pollard. "NMC was a go-to for us when we did the remodel of the data center. We've always had great service and customer care, and they're very responsive."

The long-term reliability of Cat equipment and the service and know-how Scott Data Center receives from NMC make for a solid long-term partnership. Future expansion plans call for the addition of four more Cat 3516 generator sets.

"Caterpillar has been in the business for a long time, so we're confident they're not going anywhere," Pollard added. "Ten years from now, NMC will have trained technicians who know how to service power generation systems. When we are investing in equipment, product reliability and dealer support are primary drivers for us."

For more information, please visit cat.com/powergeneration

NMC Power Systems installed four Cat® 3516 diesel generator sets and a customized Cat switchgear system to power Scott Data Center, earning the building a Tier 3 certification.

LEXE0835-01 September 2014