

POWER PROFILE

Customer: Mount Pleasant Municipal Utilities

Location:

Mount Pleasant, Iowa

Customer Business Issue:

Standby Power Plant, Peaking Power

Solution:

Twelve Cat® 3516B diesel generator sets

Cat® Dealer:

Altorfer Power Systems



Twelve Cat® 3516B diesel generator sets housed in a stand-alone building next to the main office can economically produce 24 megawatts should the entire city of 8,700 residents lose power.

POWER NEED

Established in 1897, Mount Pleasant Municipal Utilities provides water to the city and outlying areas, and delivers power purchased from the Mid-Continent Independent System Operator (MISO) market to its customers via three local substations.

While its primary function is to distribute grid power, the municipal utility also has generation capacity of its own, relying on a backup generation plant to produce enough power should the entire city of 8,700 residents lose power, such as it did during an ice storm that crippled east central Iowa in January 2007.

Mount Pleasant is subject to RICE NESHAP reporting requirements from the EPA, a set of rules that governs emissions from reciprocating internal combustion engines. The utility is also subject to monitoring and performance guidelines from the Iowa Department of Natural Resources.

SOLUTION

Twelve Cat® 3516B diesel generator sets housed in a stand-alone building next to the main office make up the backup generation plant, which can economically produce 24 megawatts of backup power.

Beyond the security of maintaining its own backup generation plant, Mount Pleasant Municipal Utilities also has quick-start capability during periods of peak demand, or when resources from the power grid are taxed, such as they were during the bitter winters of 2018-19.

“The primary mission of the plant is to serve as emergency backup,” says Jack Hedgecock, general manager of the municipal utility in southeast Iowa. “Along with that, we are able to utilize those generators for capacity credits within the MISO market, so when we’re not using them for emergency needs, they help protect against system-wide constraints and anomalies that affect the transmission network. So, in reality our generation plant serves a dual purpose.”

“Normally, the transmission system constraints occur during the hot summer months, when the network reaches peak load conditions,” Hedgecock says.

But in recent years, the utility has been asked to run its plant during very cold weather conditions due to generation base-load shortages caused by power plant outages around the Midwest. In 2019, the Cat gensets delivered a total of 478,154 kilowatt hours, burning about 31,343 gallons of diesel fuel.

To ensure emissions compliance with the revised regulatory rules, the gensets were retrofitted with an emissions catalyst system and electronic monitoring that tracks air emissions anytime the gensets run. As part of the regulatory process, Mount Pleasant is also required to perform periodic performance testing to make sure it continues to meet all environmental emissions standards.

“Every time we run, the emissions monitoring system tracks the performance of our engines, looks for potential system anomalies and helps ensure that regulatory performance parameters are being met,” Hedgecock says.

Mount Pleasant Utilities downloads the recorded data from the system monitoring equipment once a month to document all of the performance information for the period. An additional requirement of the regulatory process includes submitting a bi-annual report to the Iowa Department of Natural Resources verifying those performance numbers.

RESULTS

Mount Pleasant counts on its Cat dealer, Altorfer Power Systems, as well as another firm that installed the emissions control system to remain in compliance. Altorfer technicians perform periodic testing of the engines, and also perform regular maintenance as part of a long-term Cat Customer Value Agreement.

Mount Pleasant also has an extended warranty that it purchased thru Caterpillar to guard against catastrophic failure of any of the generator sets.

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"When you run these engines, there are complex mechanical elements involved and a lot of critical maintenance procedures that have to happen to ensure that the equipment operates effectively," Hedgecock says.

An Altorfer service technician performs a standard series of monthly and annual tests, including thermal imaging, valve adjustments, and oil sampling.

"Altorfer analyzes the oil samples, looking for metal particulates or anything out of the ordinary that could tip us off to a potential problem, prior to experiencing a major equipment breakdown," Hedgecock says. "Those are the kind of right-skill proficiencies that communities of our size wouldn't be able to staff for economically. "It's a good opportunity to have experts who can draw on their vast experience for trend analysis that can help us with those specialized tasks."

Hedgecock sees the relationship between the municipal utility and Altorfer as a partnership.

"Anytime we have questions about our generator operation, or if we see an anomaly on our emission control equipment, we can download data, send it to Scott Formanek, our product support manager, and he and his team can leverage their resources and help us figure out what's going on."

Adds Mount Pleasant electric supervisor Greg Thu: "We'll have an alarm go off, and if we don't know what it is, we can call our Altorfer service tech, and if he doesn't know the answer right away, he will get us the answer. And the next time he's here doing maintenance, he'll go over it with us, explaining what the issue was."

Mount Pleasant receives approximately \$650,000 a year from MISO in capacity credits to ensure that its gensets are available for a certain number of hours each year for system support. Part of Mount Pleasant's motivation for building a new power plant in 2001 was to resurrect the capacity credits, and the utility chose Altorfer Power Systems as a primary supplier when it fast-tracked the new power plant.

With 37 years in the utility business, Hedgecock has been around long enough to see different services provided on many different levels, whether it is buying routine utility material items, station transformers or maintaining diesel engines.

"Cities and communities that are considering doing a project like this, or are looking to maintain what they already have, should partner with somebody that's actually going to work with them and give them a well-rounded service offering," he says. "It's a partnership. They need to find somebody that's going to be there for the day-to-day things, as well as when the going gets tough. Greg can get on the phone at 2 a.m., and he can reach an Altorfer contact."

"And that's a really important thing when you have millions of dollars worth of equipment sitting there that isn't running," Hedgecock says. "So, it's a bigger picture. There's a price for those services, and I think you just need to understand the ongoing value that a structured maintenance agreement can provide to your operation. It's more than just the sale of the equipment. It's the service after the sale, and that's what we receive from Altorfer."



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