Standby power

> Case History
Arrowhead Emergency Generating Plant
Covill, Minnesota, USA

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Cummins Power Generation

Where:
Covill, Minnesota

What:
Nine Cummins Power Generation 2 MW engine-driven generator sets installed in a remote standby generator site

Purpose:
Provide reliable backup power for electrical co-op customers in secluded area where high winds cause frequent outages

Primary choice factors:
Cummins Power Generation was chosen due to expertise of engineers and technicians, reputation in diesel generator sets and ability to assure reliability based on the site's remote location and accompanying monitoring needs

Cummins Power Generation provides backup power along the remote North Shore of Minnesota

GRAND MARAIS, MINNESOTA, USA — The North Shore of Lake Superior in northeast Minnesota is enjoyed by residents and visitors because of its remote location and secluded woods. But this remoteness can bring risk as harsh winds blow rough storms off the largest of the Great Lakes.

For the thousands of residents who live in the North Shore region, the wooded area and frequent storms raise concerns over the reliability of their electric power service. Great River Energy (GRE) — a not-for-profit generation and transmission cooperative — provides wholesale electric service to 28 distribution co-ops that cover approximately 60 percent of the state of Minnesota. All but one of these cooperatives are provided with power using a loop transmission system. As the name implies, a loop transmission system circles through the distribution area and provides power from two directions. If power fails from one direction in a loop distribution, fast restoration is likely by feeding power from the other direction. Due to the geography of the North Shore region, Arrowhead Electric Cooperative Inc. (AECI) receives power through a radial

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A 7,500-square-foot building houses the nine generators that can support a total load of 18 MW.

transmission line, meaning there is a single source line for a group of customers. When this one line is unavailable, all customers beyond the fault are without power.

Because the winters in this part of the country are so harsh, AECI and GRE took actions to minimize the time their customers would be without power due to an outage.

The standby generator facility near the town of Covill was built to help improve the reliability of electric service in the Arrowhead region of Minnesota. Creating a loop transmission system is one way to increase reliability, but burying a line on the North Shore is impossible because the terrain rests on granite bedrock. Another above-ground line would be expensive, require significant land and disturb the natural beauty of the area.

Instead, AECI and GRE chose to install an emergency standby generating facility with diesel driven generators by Cummins Power Generation at the northernmost end of the single power transmission line. The Arrowhead Emergency Generating Plant can feed power to customers from the opposite direction of the usual energy flow into the region. This helps AECI quickly restore power to more customers in the event of a failed transmission line.

Nine 2 MW generators and the PowerCommand® Digital switchgear Model 300/MV supplied by Cummins Power Generation are installed at the Arrowhead standby generator site. A 7,500-square-foot building houses the nine generators that can support a total load of 18 MW.

According to Dan Biro, power generation sales at Cummins NPower, the switchgear at the Arrowhead facility allows the site to be reliably and remotely monitored and controlled from GRE's system control center five hours away in Elk River, Minn.

"The remote monitoring of the equipment helps to ensure a fast reaction time following an outage," Biro said. "If the line goes down, the Great River Energy system operators will be notified immediately and can start the plant up in a matter of minutes. The quick reaction will help reduce the amount of time the end customer is without power."

Because of the nature of the surrounding region, this site also needed to be neighbor-friendly. Site noise and appearance were two of the community's concerns that had to be considered while planning the facility's construction. The nine generator sets were installed on a 20-acre property to ensure there is no sound or visual disturbance. The facility also meets the Environmental Protection Agency's Tier 2 requirements for emissions standards.

Built by Energy Alternatives of Farmington, Minn., the facility also features a 35,000-gallon diesel storage tank to ensure the facility can operate for more than 24 hours without fuel delivery since so many of the roads may become impassible during winter storms.

With this new standby power site, residents of Covill and other North Shore communities can enjoy their surroundings and keep the lights on during a storm.

For more information about integrated standby power systems, contact your local Cummins Power Generation distributor or visit www.cumminspower.com.

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