

3M's New High-Capacity Overhead Conductor Is Installed and Activated on Xcel Energy's Black Dog-Blue Lake Transmission Line; First Commercial Application of Breakthrough Bottleneck Solution Will Add Peak Demand Power for Twin Cities

Xcel Energy, which serves 3.3 million electricity and 1.8 million natural gas customers in 10 states, has installed and energized 3M's new aluminum conductor composite reinforced (ACCR) overhead conductor on a 10-mile line that is an integral part of the electricity grid in the Upper Midwest. It is the first commercial application of the ACCR, which more than doubles the transmission capacity of conventional conductors of the same diameter without requiring construction of new towers.

"Xcel Energy has assumed a leadership role in introducing the first major advance in transmission technology in decades," said Tracy Anderson, business development manager, 3M Composite Conductor program.

The new ACCR conductor was installed during an eight-week period on Xcel Energy's Black Dog-Blue Lake line in Minnesota, which extends from Shakopee to Burnsville. The high-capacity conductor will support the expansion of the utility's Blue Lake plant, which will provide additional power during peak demand periods in Xcel Energy's Upper Midwest service territory.

"The ACCR provided a fast and cost-effective option for delivering additional energy from Blue Lake to our 1.5 million electricity customers in the Upper Midwest," said Doug Jaeger, transmission vice president, Xcel Energy. "Without it, we would have had to replace existing towers to accommodate larger sized conventional conductors. Use of the new conductor allowed us to boost capacity on the line, while avoiding major construction in an area with sensitive wetlands."

3M ACCR is intended as a solution to thermally constrained transmission bottlenecks that have increasingly plagued electricity grids in recent years, causing brownouts and blackouts. According to Anderson, other major utilities are indicating strong interest in the high-capacity conductor.

"Energizing the Blue Lake line is a major milestone," said Anderson, noting that 3M anticipates closing additional sales of the ACCR within the next couple of months. "We believe the ACCR will play a significant role in making the national electricity grid more reliable," he added.

ACCR, a new type of bare overhead conductor, containing a multistrand core of heat-resistant aluminum matrix composite wires, retains its strength at high temperatures and is not adversely affected by environmental conditions, such as moisture or UV exposure. Because of its lightweight and reduced thermal expansion properties, the conductor can be installed on existing towers and requires no visual changes to a line or additional rights-of-way.

The ACCR has been extensively tested in the laboratory and field tested for more than four years, including Oak Ridge National Laboratory in Tennessee, under the auspices of the U.S. Department of Energy, and at locations operated by Xcel Energy; Western Area Power Administration (in North Dakota and Arizona) sites; the Salt River Project, also an Arizona utility; Hawaiian Electric Company; and Bonneville Power Administration at a site in Washington state. The power line has been proven under a broad range of extreme conditions, such as salt water corrosion, high winds, vibration and extreme heat and cold.

3M teamed with various companies whose expertise in certain components helped to make 3M ACCR viable. Key contributors include Wire Rope Industries, Nexans Inc., Preformed Line Products Co. and Alcoa Conductor Accessories. Organizations playing key supporting roles in laboratory and field testing of the technology include National Electric Energy Testing, Research and Applications Center (NEETRAC); Kinectrics, Oak Ridge National Laboratory (ORNL); and the U.S. Department of Energy Western Area Power Administration.

The technology has been recognized by R&D Magazine with an R&D 100 award as one of the most technologically significant products introduced into the marketplace and by the Minnesota High Tech Association with a Tekne Award for innovative development.

More information about the 3M Composite Conductor is available at www.3M.com/accr.

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