3M Composite for Boosting Electric Power-Line Capacity Could Be Key to Reducing Congestion

An advanced power-line cable from 3M, designed to reduce electrical transmission congestion by increasing overhead electrical power-line capacity, is undergoing advanced field testing by utilities in three states. Concurrently, it is the subject of a pilot program under way at the National Transmission Technology Research Center at Oak Ridge National Laboratories in Tennessee with the support of the U.S. Department of Energy.

The product, which has performed well in field tests so far, may help provide near-term solutions to some of the bottlenecks and overload problems afflicting the nation's power grid.

Known as the 3M composite conductor, the new cable is capable of transmitting two to three times more electricity than conventional power-line cables of the same diameter without additional weight or the need for more towers. The new heat-resistant conductor is aimed at reducing transmission bottlenecks by enabling utilities to increase power-line capacity on existing structures with no additional easements.

"Congestion is recognized as a key issue facing America's transmission grid and our unique conductor could well be an important part of the solution to this problem," said Tracy Anderson, who heads 3M's composite conductor program. "With our innovative conductors, utilities could be able to increase the capacity of existing lines without the need for additional rights of way or visual changes to the lines."

Composed of a ceramic fiber-reinforced aluminum core wrapped in aluminum-zirconium wires, the 3M conductor is lightweight and can be installed on existing towers using conventional installation equipment. The new conductor, also know as aluminum composite conductor reinforced (ACCR), sags less than conventional power lines -- so it could potentially be used to span difficult geographic features, such as wide rivers, canyons or lakes.

The 3M composite conductor has performed well in field tests in Hawaii, North Dakota and Minnesota -- states where weather conditions pose significant challenges. The field tests are being conducted by Hawaiian Electric Co., Xcel Energy (Minnesota), and Western Area Power Administration (North Dakota), in addition to Oak Ridge National Laboratories.

The successful field test conducted by Hawaiian Electric Co., in a highly corrosive atmospheric environment, was described in an article in Transmission & Distribution World magazine in its June 2003 issue. In addition, R&D Magazine, in its September 2003 edition, cites the 3M composite conductor as one of the most technologically significant products introduced this year.

Companies contributing key components to the 3M composite conductor include Wire Rope Industries, Nexans Inc., Preformed Line Products Co., Alcoa Conductor Accessories and the U.S. Department of Energy, which sponsored a portion of the work as part of its Transmission Reliability program. 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; and Western Area Power Administration.

More information about the 3M composite conductor is available at www.3m.com/accr.

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company's customers know they can rely on 3M to help make their lives better. 3M's brands include icons such as Scotch, Post-it, Scotchgard, Thinsulate, Scotch-Brite, Filtrete, Dyneon and O-Cel-O. Serving customers in more than 200 countries around the world, the company's 70,000 people use their expertise, technologies and global strength to lead in major markets including consumer and office; display and graphics; electronics and telecommunications; safety, security and protection services; health care; industrial and transportation. For more information, including the latest product and technology news, visit www.3M.com.

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