

3M ACCR Overhead Conductor a Highlight of President Bush's Visit to Company's Labs; White House Interest Underscores Importance of Advance in Power Transmission; Six Major Utilities Choose the Metal Matrix Conductor in Past 12 Months

A breakthrough technology that is already helping American utilities eliminate transmission bottlenecks was a primary focus of a recent visit to 3M laboratories by President George W. Bush.

The president obtained a firsthand look at the metal-matrix overhead conductor known as the 3M Aluminum Conductor Composite Reinforced (ACCR), which is designed to resist heat sag and provides more than twice the transmission capacity of conventional conductors of similar size. Developed in partnership with the U.S. Department of Energy, the new conductor currently is in use, or selected for use, by six major utilities across the country and is attracting widespread interest globally.

Bush's February visit was intended to help enhance the nation's leadership role in technology. He told reporters he chose 3M because of its long history as a technology innovator. In addition to the ACCR, the president viewed the company's hydrogen fuel cell component technology and microreplication technology for electronic displays.

"We are delighted at the president's interest in this important advance in electric power transmission," said Tracy Anderson, who heads 3M's composite conductor program. "Aluminum has been a key ingredient in bare overhead conductors for decades. The difference with the 3M solution is that it is based on the use of aluminum processed in new and unique ways to create high-performance and reliable overhead conductors that retain strength at high temperatures and are not adversely affected by environmental conditions"

During the president's visit, 3M engineers explained that the 3M ACCR's strength and durability derive from its nanocrystalline aluminum oxide (alumina) fibers, which are embedded in the high purity 3M aluminum matrix core wires, utilizing a highly specialized and patented process. The constituent materials are chemically inert with respect to each other and can withstand extreme temperatures without chemical reactions or any appreciable loss in strength.

Recent tests of the conductor at Oak Ridge National Laboratory demonstrate the conductor's integrity after exposures to temperatures even higher than the rated continuous operating temperature for a limited time - a significant safety factor over 210 degrees Celsius. The fact that it's based on aluminum means that the conductor is not adversely affected by environmental conditions, such as moisture or UV exposure, and it has the durability typically associated with aluminum-based conductors.

"We're confident this new conductor will make a major contribution to improving the reliability of our nation's transmission grid," Anderson says. "Its application directly addresses the need to quickly upgrade our nations thermally constrained transmission lines, which are one of the primary sources of transmission congestion."

Prior to its commercial sales, the ACCR was extensively field tested for more than four years in cooperation with several utilities in various parts of the nation, in addition to the U.S. Department of Energy at the Oak Ridge National Laboratories in Tennessee. The conductor was exposed to a broad range of extreme environmental conditions and met all performance expectations.

Today, 3M holds 14 patents on this technology. The 3M ACCR 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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