National Grid Test of High-Tech Conductors is up in the Air
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They may look like garden-variety transmission conductors, but the recently developed, high-capacity conductors National Grid is testing on a circuit in western New York are definitely not your father's transmission conductors.

Manufactured by St. Paul-based 3M and Composite Technology Corporation (CTC) of Irvine, Cal., the two types of conductors were installed in two contiguous 3,300-foot sections as part of a 10-mile, double-circuit transmission line upgrade project between the cities of Niagara Falls and North Tonawanda, near Buffalo. Unlike many traditional transmission conductors, which have a steel core, these new conductors have a core made of high-strength, low-weight composite material, which enables them to carry significantly more electricity than traditional transmission conductors of the same size. Using a composite core also eliminates the corrosion that can build up within a steel-core conductor.

"As demand for electricity continues to grow, so does the challenge of building new transmission circuits necessary to keep pace with that demand," said Marc Mahoney, vice president of Transmission Network Asset Management. "We are responding by developing innovative ways to increase the capacity of our existing network, while maintaining high levels of reliability and reducing congestion, or bottlenecks, on the system."
The advanced conductors offer the additional benefit of sagging less than traditional conductors. Increasing the amount of electricity that flows through a conductor causes it to heat up, expand and sag. Safety codes require specific clearances between conductors and the ground, based on the capacity rating of the conductor. With less line sag, existing transmission structures can be used for retrofit projects such as this one where additional capacity is required. This helps to reduce project cost and duration.

Over the next several years, various properties of the two conductors such as durability and integrity, vibration levels in various weather and wind conditions, and tension and sag levels will be tested in the field and in the laboratory to determine their viability for more widespread use throughout National Grid's electricity transmission network.

"We manage our transmission network to deliver benefits to our customers, communities and electricity markets," explained Mahoney. "One of the most effective ways to accomplish this is to maximize the delivery capability of our existing system. These conductors may significantly enhance our ability to do just that."

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