



Secure Super Grid Debuts

CON ED TURNS TO SUPERCONDUCTING CABLES

BY SALVATORE SALAMONE

» **CONSOLIDATED EDISON, THE U.S. Department of Homeland Security (DHS) and American Superconductor are teaming in a pilot project to test technology to enable what is being called Secure Super Grids.**

The idea behind the project, which began in May, is to build a system that reduces outages and disruptions by tapping the current-carrying capacity of high-temperature superconducting (HTS) cables and using systems to automatically adjust to power shifts. Specifically, the long-term objective is to make power grids more resilient by automatically shifting loads and protecting against surges to minimize the occurrence of major outages.

"As we saw with the August 2003 blackout and in incidents since, disruptions to the power grid have far-reaching effects and a tremendous economic impact," said Jay M. Cohen, DHS under secretary for science and technology. "We have asked American Superconductor and Consolidated Edison to demonstrate superconductor solutions in New York City that will serve to keep our centers of commerce on line under all conditions including grid events related to severe weather, accidents, or terrorist attacks."

Previous superconductor cable deployments such as the U.S. Department of Energy-funded American Electric Power pilot program in Cincinnati are testing the capabilities and operational issues associated with the HTS cables themselves.

This new project, dubbed Project Hydra, has a broader mission to test both the cable and the total system's capabilities to detect and suppress surges that might ordinarily cause problems for the power grid.

"This is different from past tests of superconductor cables," said Stephen Kurtz, project manager for the superconductor project. "This has fault tolerance built in. This is an integrated system to protect against ... surges.

"Over the next 16 months, we will attempt to demonstrate in a lab setting that this technology does manage and suppress" surge currents, said Kurtz. "If it proves out, we will tie two substations in New York together."

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DHS is expected to invest as much as \$25 million in the development of this technology to enable Secure Super Grids in the United States. Such grids will utilize customized HTS wires, HTS power cables and ancillary controls to deliver more power through the grid while also being able to suppress power surges that can disrupt service, according to American Superconductor.

Testing of the first Secure Super Grid system

is targeted for completion by the end of 2008. Then, a second phase of the project will focus on the deployment of the first Secure Super Grid system in Con Edison's power grid in New York City at an undisclosed location. This deployment will include the installation of a 13-kilovolt HTS cable system, which is expected to be commissioned in 2010.

Con Edison sees the technology in Project Hydra as being an enabler in its Third Generation or Three-G "system of the future" design philosophy. Kurtz is a member of Con Edison's Three-G team.

One of the benefits Con Edison expects to obtain using Three-G's design approach is a reduction in the number of substations it will need to build in the future. While there are no hard numbers here yet, Con Edison estimates that given today's clogged underground pathways, congestion and the growing demand for electricity in New York City, if it needed to add 10 substations using current Two-G technology, it might be able to cut that to six substations with Three-G.

Project Hydra's usefulness is expected to extend beyond Con Edison's network. Once the technology is proven to work, it will be applied to secure other power grids.

"The Department of Energy believes high-temperature superconductor technology is vitally important to the modernization of the nation's power grid," said Kevin Kolevar, director the department's Office of Electricity Delivery and Energy Reliability.

