An innovative solution can reduce disruptions to the Indian power industry

*Fault current limiters can help to create reliable transmission and distribution of power in India*

Power outages due to sudden power surges — a common challenge plaguing the power sector in India today that can be caused by lightning and downed power lines — might soon be a thing of the past thanks to technology developed and manufactured by Applied Materials, Inc. By implementing this technology that enables N+1 or N-1 redundancy, a more reliable transmission and distribution of power may soon be a reality in India.

This promising technology is a superconducting fault current limiter (SFCL) which is designed to help protect the electrical grid from fault currents - or the sudden power surges that can damage expensive equipment and disrupt power transmission. Applied’s SCFCLs have been successfully demonstrated at a number of sites, and most recently, a unit was successfully installed at a major utility in New York State, USA.

In a country like India, with its growing economy and increasing demand for power, both public and private utilities may significantly benefit from this technology. For example, Applied’s SCFCL can help these companies improve grid reliability, protect power system equipment from severe mechanical, magnetic and thermal stresses, and other undesired consequences of fault currents.
Currently, one of the biggest challenge utilities face is in upgrading their systems for higher power capability or adding capacity to mitigate increased fault current levels. With increase in energy demand, and as more sources for power generation (e.g. such as wind and solar power) are being added to an already overburdened system, the fault current levels are likely to increase. Therefore, the need to mitigate fault currents is more critical than ever.

SCFCLs may help the utilities overcome these problems. The technology employs the characteristic of impedance on demand whereby impedance is introduced when the system needs to reduce fault levels. This feature may enable SCFCLs to avoid increase in active and reactive power loss, voltage drop or voltage instability that may be found in traditional current limiting reactors.

According to Aninda Moitra, President & Managing Director of Applied Materials India, “As the global leader in precision materials engineering, we are committed to applying our expertise to drive the technology innovations needed to create high value products. The SCFCL reflects our commitment to advance energy efficiency and to greatly benefit the Indian power transmission and distribution ecosystem.”

Paul Murphy, General Manager of Applied Materials Power Systems Group, explains, “SCFCL is a scalable solution that promotes grid reliability, in addition to lowering operational costs and other overhead. By way of example only, if a fault current limiter were to reduce fault currents by 50 percent, the overall mechanical and thermal stresses and associated safety hazards to personnel and equipment would be reduced by a factor of 75 percent. The scalability of this technology is designed to ensure that it is applicable at the lowest levels of distribution (6.6kV) to the highest levels of transmission voltages (> 400kV).

Managing the power sector in India is critical. Today, constraints in the flow of electricity through the existing transmission system drive inefficiencies and costs for upgrades. Therefore, there is a pressing need to limit transmission constraints or disruptions to the maximum extent possible.”

India has made huge strides over the past decade in improving the power generation capacity. To reach the full potential of making stable, reliable electricity available to everyone, the focus has to shift towards improving transmission network. Applied’s SCFCL technology may help the transmission and distribution sectors to achieve this goal.

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